



# The 20 Step Guide to Cutting Energy Bills in Your Business



**Jon Dee**

**DO SOMETHING!**



Australian Government

Department of Industry and Science

Jon Dee's *Energy Cut* book demonstrates that energy efficiency can be good for business and the bottom line.

In simple steps, this easy-to-read guide shows you how to reduce your energy use and make your business more efficient.

If you want to save money on energy bills, then this book is for you. It's a must-read manual for all small businesses.

*Peter Strong*  
CEO,  
*Council of Small Business of Australia (COSBOA)*



# EnergyCut

## How to use this guidebook

Make sure you have the latest (free) Adobe Reader software.

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In Adobe Reader, go to the pull-down 'View' menu at the top of the page and choose 'Page Display'. Then select 'Two Page View' and 'Show Cover Page in Two Page View'.

### How to navigate this guidebook:

The main contents can be found on pages 8-9. Click your cursor on a step title and it will take you to the beginning of your chosen step.

**Back to Contents** When you click your cursor on a 'Back to Contents' button, it will take you to the contents of that step.

**Back to Main Contents** When you click your cursor on the 'Back to Main Contents' button, it will take you to main contents on pages 8-9.

The 'Did You Know?' bubbles at the start of each step are interactive. If you see a bubble that interests you, click on it for more detailed information.

All hyperlinks and websites in this guidebook are active – clicking on them will launch the sites in your web browser.

## Energy Cut

### The 20 Step Guide to Cutting Energy Bills in Your Business

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Published 2015 by DoSomething (second edition)

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Jon Dee would like to thank:

his wife Leanne and daughters Estelle and Claudia, his parents, Mel Telford (his economics teacher for inspiring his love of economics), David Malicki, Vincent Cornes, Andrew Randall, Kevin Tattrie and the above team for their invaluable assistance. On behalf of DoSomething, he would also like to thank the Department of Industry and Science for funding the Energy Cut project.

Also by Jon Dee:

Small Business: Sustainable Growth

Published 2010 by Sensis Pty Ltd

Design and typeset by Modern Art Production Group

Published by DoSomething - ABN 29 129 319 204

PO Box 585, Katoomba, NSW, 2780 Australia



**Australian Government**

**Department of Industry and Science**

**Government disclaimer:** This activity received funding from the Department of Industry and Science. The views expressed herein are not necessarily the views of the Commonwealth of Australia and the Commonwealth does not accept responsibility for any information or advice contained herein.

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## Foreword by Jon Dee

**When you reduce your use of energy, you cut your energy bills. It's a guaranteed way to improve the profitability, resilience and value of your business.**

Despite this, many business owners don't know how to reduce their energy costs. When they do they're often too busy to do anything about it.

That lack of knowledge and time is the reason why I've written 'Energy Cut'. It's a simple 20 step guide to cutting the energy bills in your business. Its aim is to save you money and improve your bottom line.

You don't have to be an expert in energy efficiency to understand this book. You also don't have to implement every step - the program is designed to be carried out at a pace that fits in with your busy schedule.

Many of the solutions in 'Energy Cut' can be implemented at little or no cost. Where you do invest in energy saving measures, the financial benefits can be significant - with LED lighting, for example, you can reduce your lighting bills by up to 83%.

I do hope this book makes a positive difference to your business. If you have a question, please send it to me via [Twitter.com/JonDeeOz](https://twitter.com/JonDeeOz).

Jon Dee, Founder and Managing Director

**DoSomething**





# The case for action

## The financial reasons to make your business more energy efficient

In recent years, rising energy prices have had a real impact on many businesses. It's reached the point where 62% of small businesses worry about the cost of their next energy bill.<sup>1</sup>

Energy waste also has a huge impact. Due to inefficient use of energy, Australians are spending billions of dollars more than they need to on electricity, gas and fuel.

Cutting energy waste out of your business won't just save you money. As this section will show, it can make a real difference to the productivity and efficiency of your organisation. Being energy efficient can also boost the resilience and value of your business.

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***A 1% improvement in Australia's energy efficiency would boost our economy by up to \$1.5 billion.<sup>2</sup>***

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<sup>1</sup> Research carried out by Colmar Brunton for MyAGLIQ in February 2013.

<sup>2</sup> [EnergyCut.info/Business-Spectator](http://EnergyCut.info/Business-Spectator)

- ▶ **How much can Australians save on energy bills?**
- ▶ **What SME owners think about energy efficiency**
- ▶ **How energy efficiency increases the value of your business**

## **How much can Australians save on energy bills?**

Australians are spending billions of dollars more than they need to on energy bills.

A 2013 report by Vivid Economics showed that a 1% improvement in Australia's energy efficiency would boost our economy by up to \$1.5 billion.<sup>3</sup>

Their research also showed that if we kept up that level of annual improvement, Australia's economy would gain an extra \$8 billion by 2020 and \$26 billion by 2030.<sup>4</sup>

These energy savings are not just restricted to electricity and gas. If we caught up with European fuel economy standards, by 2024 we could collectively save \$8 billion on petrol. For the average driver, that would be a saving of up to \$850 per annum.<sup>5</sup>

## **What SME owners think about energy efficiency**

Research commissioned on Australian small and medium enterprises (SMEs) for 'My AGL IQ'<sup>6</sup> found that:

- over 80% feel it is worthwhile making the effort to reduce energy use in their business
- 62% worry about the cost of their next energy bill
- 73% feel that more efficient use of energy would save them money
- 50% regularly review their energy costs
- 50% indicated a lack of concern from employees when it comes to energy use at work.

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3 [EnergyCut.info/BusinessSpectator](http://EnergyCut.info/BusinessSpectator)

4 [EnergyCut.info/BusinessSpectator](http://EnergyCut.info/BusinessSpectator)

5 [EnergyCut.info/BusinessSpectator](http://EnergyCut.info/BusinessSpectator)

6 Research carried out by Colmar Brunton for My AGL IQ in February 2013. Further information on this research can be read at: [EnergyCut.info/ant-hill-office-bill](http://EnergyCut.info/ant-hill-office-bill)



## How energy efficiency increases the value of your business

With rising energy costs, an investment in energy saving measures can directly contribute to an increase in the value of your business.

When a company moves to buy another business, one of the key things they look at is operating costs. One of the biggest costs for any business, apart from staffing, is the amount of energy it uses.

By investing in energy efficient equipment and machinery, you immediately reduce the operating expenses of your business and improve your margins.

If you ever move to sell your business, this will make your books look better and shows that your business is efficient.

### Reinvest your savings

Any savings you make in energy costs can be reinvested to further reduce your energy bills. This includes upgrading equipment and creating your own energy with solar panels.

This will help to protect your business from rising energy costs and can increase profitability.

Depending on where your business is based, you may be able to generate revenue by selling surplus solar electricity to the grid. You may also be able to store solar energy with batteries and use it during times when electricity is charged at peak rates.

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***Energy waste costs  
Australian businesses billions  
of dollars every year.***

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# Energy Cut – The 20 Steps



**STEP 1:** Add up your energy costs



**STEP 2:** Measure your energy use



**STEP 3:** Write an energy reduction plan



**STEP 4:** Get your staff on board



**STEP 5:** Negotiate a better energy deal



**STEP 6:** Switch off and save



**STEP 7:** Watch your thermostat



**STEP 8:** Cut your lighting bills



**STEP 9:** Lower your heating, ventilation and air-conditioning costs



**STEP 10:** Get comfortable with insulation



**STEP 11:** Cut your IT energy costs



**STEP 12:** Reduce equipment energy costs



**STEP 13:** Save money on transport



**STEP 14:** Cut your refrigeration costs



**STEP 15:** Reduce hot water costs



**STEP 16:** Save money with solar



**STEP 17:** Energy efficiency and your building lease



**STEP 18:** Financing your upgrades



**STEP 19:** Look out for innovation



**STEP 20:** Further information









## STEP 1

# Add up your energy costs

**Your first step is to find out how much money you spend every year on energy.**

Have you ever experienced bill shock? Many Australians are concerned about their energy bills, but few of us add up how much we spend every year on our electricity, gas and fuel. When we do, it can come as a nasty surprise!

That's why we've come up with the Energy Bills Savings Calculator. It makes it easy for you to add up all your energy expenditure.

To get started, collect all your energy bills from the last 12 months and go to [EnergyCut.info/bills-calculator](https://EnergyCut.info/bills-calculator).

After you input how many dollars you've spent on electricity, gas, and fuel, our calculator will show you how much money you'll save if you reduce your energy bills by 10%, 20% or 30%.

If you want to save money, read on! As you'll find out, there are many easy ways to cut your energy bills. This book will show you how.



ENERGY NOW

08:00

3093

kW

7.20

kWh

20.3°C

Wi-Fi

# Measure your energy use



## STEP 2

Now you know what you're spending on energy, the next step is to find out exactly where it's being used and how efficiently it's being used.

Once you know where your biggest energy expenditure is occurring - it could be your equipment, your heating/cooling or your lighting - you will be focused on the area where you can make the most savings. So it is essential that you measure your energy use before you write your energy reduction plan.

There are a number of low cost, easy-to-use options for monitoring energy use. The cost saving benefits of these tools are detailed in this step:

- **Energy displays and monitors:** These devices are cheap to buy and track your energy use in 'real time'. They can be used regardless of whether you rent or own your premises. Your local library may also lend them out.
- **Tablet and smartphone energy monitoring apps:** Apps are now available for Android and Apple devices that enable you to monitor your energy use in real time.
- **Online energy monitoring:** Many energy companies now offer online energy monitoring free-of-charge that shows you how much energy your company is using.
- **'Smart' meters:** These give businesses real-time information about their energy consumption. They have already been rolled out in Victoria and represent the future of energy meters.
- **Sub-meters:** If you use a lot of energy, it may pay for you to sub-meter your premises. This will give you a better understanding of where energy is being used in your business.

Alternatively, if your business uses a lot of power it may pay to have an energy audit done professionally.



# Did you know?

## Step 2: Measure

Electricity monitor displays show you in real time how much electricity you're using and how much it costs.

See page 17

Many energy retailers offer free online monitoring, so you can easily see if your energy use is going up or down.

See page 21

Plug in appliance monitors show you how much electricity an individual appliance uses. And they're cheap! Only \$20-\$35 each.

See page 20

Energy monitoring apps are now available for Apple and Android mobile devices. No matter where you are, you can now pull out your phone or tablet and see how much energy your business is using.

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**Businesses with smart meters are more likely to discover and act on the inefficiencies in their power use.**

**See page 22**



**See page 20**

**If you use a lot of energy, it may pay for you to sub-meter your premises. Having multiple energy meters can help to identify where you are using the most energy.**

**See page 23**

**Monitoring the running costs of your appliances is useful when it comes to buying replacements. It can help you to upgrade to more energy efficient alternatives.**

**See page 20**

**Putting an energy monitor display in a high traffic area makes your staff more aware of the energy being used by your business and encourages them to use less.**

**See page 17**

**There's an old business expression, 'You can't manage what you don't measure'. All businesses should measure and monitor the cost of their energy use.**

**See page 23**



# In this step

## The benefits of electricity monitoring

- ▶ [How electricity monitor displays save you money](#)
- ▶ [Tablet and smartphone energy monitoring apps](#)
- ▶ [Plug-in appliance monitors](#)
- ▶ [Monitor your energy use online](#)
- ▶ [The advantages of a 'smart' meter](#)
- ▶ [The benefits of sub-metering](#)
- ▶ [Getting help with an energy efficiency audit](#)
- ▶ [Top 10 energy auditing tips](#)



## How electricity monitor displays save you money

Electricity monitors are simple devices that enable your business to measure its energy use and costs in real time.

The monitor is made up of a sensor, a transmitter and a display. The sensor is hooked up to your meter panel by an electrician. It measures how much electricity you're using and sends that data via the transmitter to the display, where you'll see how much energy is being used and how much it's costing you.

It can also identify equipment that should be turned off and can monitor for energy spikes caused by inefficient or malfunctioning equipment.

Low cost electricity monitor displays cost from \$70-\$130. Available brands include Efergy, Belkin, Watts Clever, Current Cost, Owl and the Saveometer. These devices are particularly useful for businesses that don't have 'smart' meters.

### Ways to get the most out of an electricity monitor display

- The first time you use an electricity monitor display, wait until the end of the day, turn off all non-essential equipment and then make a note of the display reading. This reading is what you will aim to return to at the end of every business day. If your reading is subsequently higher than this, it could mean that equipment has been left on or is malfunctioning.
- The displays can be portable, so by walking around and turning equipment on and off, you can identify energy 'hot spots' in your business.
- Put your energy display in a high-traffic area. This will make your staff more aware of the energy being used by the business.
- Assign one person to monitor your energy display and report on it at meetings. This information can also be emailed to your staff.



*A typical electricity monitor display showing real time energy use and costs*

## Fitness First, NSW

As part of its major drive towards energy efficiency, Fitness First employed Knowledge Global's reporting platform, 'NRG Insight', to measure and report on the reduction in their energy consumption.

Before the project started, a consumption baseline was established for 37 sites, using data obtained from 5 years of monthly electricity bills. This baseline has enabled them to better measure their energy savings - to date they have reduced their usage in excess of 5,000Mwh per year (a reduction of approximately 14%).<sup>1</sup>

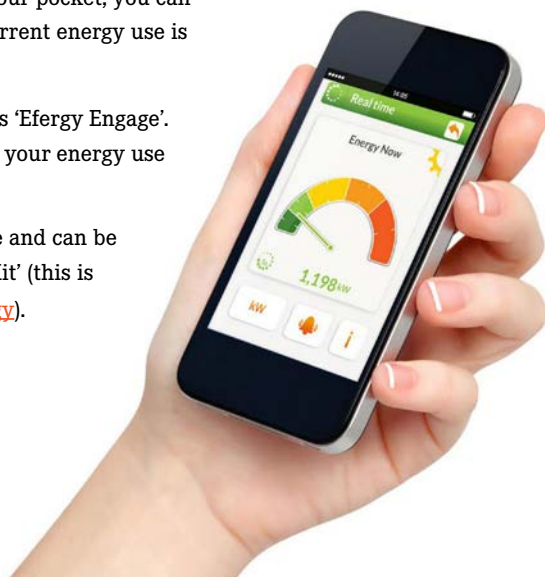
## Tablet and smartphone electricity monitoring apps

Electricity monitoring apps are now available for Android and Apple mobile devices. No matter where you are in the world, these apps can show you 24 hours a day how much energy is being used by your business.

Just by picking your phone out of your pocket, you can immediately see how much your current energy use is costing you.

One high quality app in this space is 'Efergy Engage'. Every 5-6 seconds, this app updates your energy use and costs on screen.<sup>2</sup>

The app can be downloaded for free and can be used with the Efergy 'Engage Hub Kit' (this is available from [EnergyCut.info/efergy](http://EnergyCut.info/efergy)).



<sup>1</sup> [EnergyCut.info/fitness-first-nsw](http://EnergyCut.info/fitness-first-nsw)

<sup>2</sup> [EnergyCut.info/efergy](http://EnergyCut.info/efergy)





## What other information can you get?

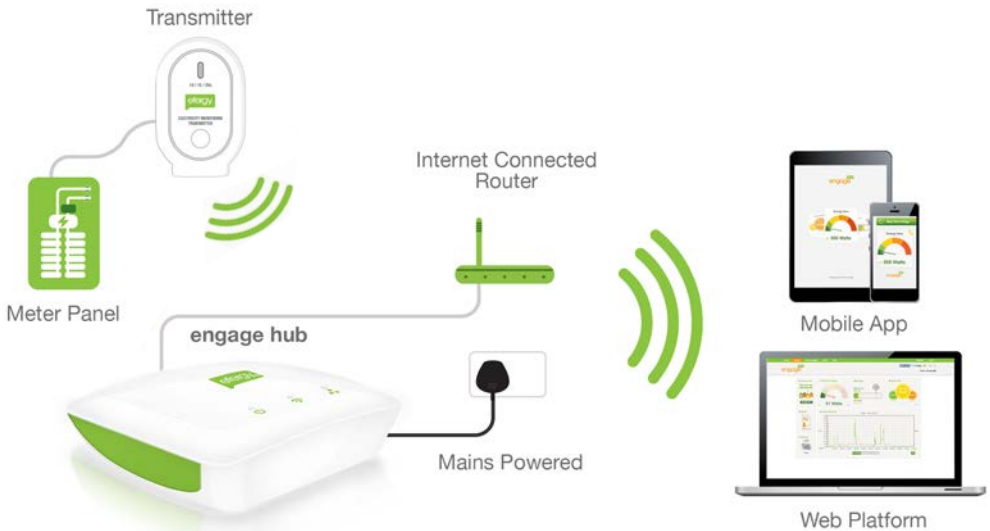
The 'Efergy Engage' app account also allows you to analyse your energy information in more detail in a web browser. You can analyse electricity use over the last week, month or year, so you can easily track whether it's going up or down. You can also see your usage history and budget how much you want to spend.

If your energy retailer charges you more for peak period electricity, the Energy Demand widget can help you to reduce costs during these times.



## How does it work?

The Efergy Engage app and online account are free. To use it, you first need to order the Efergy Engage hub kit. This kit sends electricity use information from your meter panel to the app (it does this via your Wi-Fi). The kit is available for only \$130 and represents a very low-cost way to monitor your immediate and ongoing electricity use.



## Plug-in appliance monitors

An appliance monitor can tell you the energy running costs of individual appliances.

They're simple to use. You insert the appliance's plug into the monitor. Then you insert the monitor into the wall plug socket. In real time, it gives you the appliance's energy usage and how much it's costing you to run.

Understanding the energy use and running costs of your various appliances is very useful when it comes to buying replacements.

You can compare running costs of the old and new units, and calculate the dollar savings to be had from upgrading to more energy efficient alternatives.

You can buy an individual appliance monitor for between \$20-\$35 online or at major hardware stores.



### What results can you achieve with a plug-in appliance monitor?

As part of the 'Energy Hunter' scheme in Newcastle, AOK Health used an individual appliance monitor to measure the energy use and running costs of their water boiler and kitchen fridge.<sup>3</sup> When they saw how expensive they were to run, they:

- changed the water boiler to a kettle that used 64% less energy
- replaced the fridge with a more efficient model that had the potential to save up to \$300 per year.

### Ferguson Plarre Bakehouses, VIC

An energy monitoring system enables 'real time' monitoring of all electricity and gas consumption at Ferguson Plarre. Initiatives like this have helped it become one of Australia's most energy efficient bakeries – they've reduced their electricity and gas use by 62% and 76% respectively.<sup>4</sup>

<sup>3</sup> [EnergyCut.info/aok-health](http://EnergyCut.info/aok-health)

<sup>4</sup> [EnergyCut.info/ferguson-bakehouses](http://EnergyCut.info/ferguson-bakehouses)



## Monitor your energy use online

Energy providers now offer online energy monitoring. You can log on to find out how much energy your company has been using and compare that figure with a previous period.

This online monitoring of your energy use is provided as a no-cost service by many energy providers. Some offer far better online monitoring than others, so it's worth checking to see how much information they provide.

### Suki Hairdressing, NSW

Suki hair salon began their successful energy saving campaign by monitoring how much energy they were using with the online WebGraphs system 'EnviR' electricity monitor. This was provided when they signed up to the Energy Hunter efficiency scheme.

Suki co-owner Greig Hardman conducted experiments around the salon using the monitor. By turning equipment on and off, he could see how much electricity each item consumed.<sup>5</sup>

## The advantages of a 'smart' meter

The old-fashioned meters outside businesses and homes gave very little feedback about energy use. The first thing most businesses knew about their energy usage was when the bill landed on their doorstep.

'Smart' meters, however, are a new technology which are being rolled out by energy companies. Every 30 minutes they record your electricity consumption data and at various points in the day send this data back to your energy retailer.

This has a number of benefits for businesses:

- Businesses with smart meters installed can get very detailed online reporting about their energy use. This breaks down how much energy a company has been using and allows them to compare that figure with a previous period.



<sup>5</sup> [EnergyCut.info/hairdressers-case-study](http://EnergyCut.info/hairdressers-case-study)

- When a smart meter is linked to a wireless display, businesses can get real-time feedback about the amount of energy they're using.
- Businesses with smart meters that are not linked to in-house displays can still get usage and consumption alerts and an email report midway through their billing cycle that provides a projected bill.

In NSW a customer can request to move on to a ToU (time-of-use)<sup>6</sup> tariff and a smart meter will be installed. In addition to providing you with quality information about your energy use, they can also alert you to faults in your electricity supply.

### Smart meters and your energy bills

**When households have been given the ability to actively monitor their energy use, reductions of up to 8% have been recorded.<sup>7</sup> One of the reasons for this is that people can make better informed decisions about the periods when they use energy. You can do the same in your business.**

In a submission about smart meters to the NSW Government, BZE<sup>8</sup> stated that energy-aware customers with smart meters are more likely to:

- discover and respond to their own inefficiencies in power use
- discover and respond to inappropriately high levels of standby power use
- monitor and recognise the energy generated by solar panels
- be able to identify and effectively respond to billing errors
- identify immediately when new electrical devices consume less energy
- respond more quickly to abnormal energy-use situations which could be a sign of dangerous conditions.

<sup>6</sup> To find out more about time-of-use tariffs, read page 80 in 'Step 5 - Negotiate a better deal'.

<sup>7</sup> [EnergyCut.info/renew-trials](http://EnergyCut.info/renew-trials)

<sup>8</sup> [EnergyCut.info/bze-smart](http://EnergyCut.info/bze-smart)



## Want to monitor your electricity, gas and solar energy?

If you want a more sophisticated energy monitoring system, the Australian developed Enviroview Energy Monitor system enables small to medium businesses to accurately measure and manage their electricity, gas, water and solar usage. It can do this in real time and in multiple locations across your business and provides the information in a well-designed online graphic interface.



To see how it works, view this video at [EnergyCut.info/enviroview-vid](http://EnergyCut.info/enviroview-vid) or visit their website at [envirovision.net.au](http://envirovision.net.au)

## The benefits of sub-metering

If you use a lot of energy, it may pay for you to sub meter your premises.

Many energy intensive businesses have at least two sub-meters per building. One meter can measure your general electricity use and the other can measure your heating, ventilation and air-conditioning (HVAC) energy consumption. If you have other equipment that uses significant amounts of energy, you may wish to set up a sub-meter for those too.

Some sub-meters will also give you access to your energy data online, making it easier to better manage your energy consumption.

For more information about the financial viability of sub-metering for your business, consult with an EcoSmart Electrician.

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*There's an old business expression,  
'You can't manage what you don't measure'.  
All businesses should measure  
the cost of their energy use.*

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## Getting help with an energy efficiency audit

Energy audits can identify ways in which your business can save money on its energy bills.

Carrying out your own energy survey is as simple as checking energy bills and walking around your premises to measure the energy use of all the things that use energy. The other alternative is to bring in an expert who audits your premises and identifies where you can reduce energy use.

If you bring in an outside expert, there are three new Australian Standards for energy auditing that they should adhere to. These are:

- **AS/NZS 3598.1, Energy audits, Part 1: Commercial buildings**  
This audit is for companies that operate in commercial buildings.
- **AS/NZS 3598.2, Energy audits, Part 2: Industrial and related activities**  
This audit is for companies with industrial and related activities.
- **AS/NZS 3598.3, Energy audits, Part 3: Transport related activities**  
This audit is for companies that carry out transport related activities.

These new standards allow businesses to get a more targeted energy audit that better enables them to assess the energy performance and efficiency of their operations.

Once you have chosen the audit standard that is best suited to your type of business, there are three levels of audit that you can choose to undertake. The level to which you should have your business audited depends on:

- availability of sufficient data for a detailed energy audit
- the level of detail and accuracy you require in order to make future investment decisions
- how much you spend on energy
- how much you want to maximise the energy efficiency of your business.



### What if your business can't afford a fully compliant audit?

In this instance, the standard can be used as a reference for a simpler energy review that may be more appropriate for your business. This type of energy review will be cheaper but the auditor carrying it out should not claim that it complies with the standard.

Alternatively, ask your local EcoSmart electrician to help you audit where your energy is being used and where it can be reduced.

## Type 1: Basic Energy Audit

As a rule of thumb, I recommend a Type 1 energy audit if you spend less than \$20,000 per year on energy. This covers most of the small businesses who will read this book.

According to the standard, Type 1 audits are suitable for smaller businesses with lower energy expenditures. They can also be used as a scoping audit for larger businesses. Type 1 audits can provide a measurement of your business's energy use and energy efficiency. They should also identify no-cost and low-cost opportunities with payback periods of up to two years.

A Type 1 energy audit will provide you with a short list of energy-saving opportunities for your business, along with approximate costs and savings.

To find an energy auditor, visit: [EnergyCut.info/energy-auditors](https://EnergyCut.info/energy-auditors)

## Type 2: Detailed energy audit

In most cases, I recommend a Type 2 energy audit if you spend more than \$20,000 per year on energy.

According to the standard, Type 2 audits should provide a more detailed analysis that quantifies the full range of energy saving opportunities for your business. This type of audit will provide a comprehensive review and analysis of your whole building's equipment, systems, and operational characteristics. Type 2 audits have a greater level of accuracy and need more energy data than Type 1 audits. It's best to confirm that this data is available before signing a contract for an audit.

This level of audit is also required to give you a financial analysis of recommended energy performance improvement actions that are based on agreed financial criteria. This information will help you to rank your energy saving opportunities.

### Type 3: Precision Audit

I recommend a Type 3 energy audit for businesses with large energy bills. It is also useful for companies who are looking to focus on one particular area of energy use in much greater detail than a Type 1 or Type 2 audit can provide.

This type of audit will give you a comprehensive list of energy saving opportunities for your business, along with indicative costs and savings.

Type 3 audits are detailed audits of specific subsystems, such as HVAC, building management systems, compressed air or lighting. These audits involve on site measurements that monitor energy data over a period long enough to capture all the various operating conditions and variables in how your business uses energy. This data will better quantify the business case for energy saving measures.

#### Getting assistance with an energy audit

**Some energy retailers, local councils and state governments offer assistance with energy efficiency audits. They may also be able to recommend a local energy auditor. Your local chamber of commerce can also tell you if there are rebates or subsidies for energy saving audits in your area.**







## Top 10 energy auditing tips

If you decide to bring in outside help, here are 10 tips that may help:

- Choose the energy audit that is most appropriate for your premises. For most small businesses, a Type 1 audit will suffice.
- How long has the chosen energy auditor been in business? Choose one with experience.
- Check the references of your auditor – have other businesses saved money with their advice, and did they deliver as per expectations?
- Get a clear undertaking upfront as to what the auditor will do. As a minimum, they should include a visit to your premises and provide you with a written report that tells you how to implement the changes and recommends the products that will reliably save you energy.
- Choose an energy consultant who will offer you independent advice and unbiased information on energy saving options. If the consultant is only pushing one brand of product, make sure you do due diligence on it. Use a search engine to see if there is positive or negative feedback about it online. Ask if independent testing has verified the product claims. Can their other customers give it a positive reference?
- Provide your auditor with as much information as you can about your site – this will result in the best energy-saving opportunities being identified.
- Talk to your energy auditor about any energy use issues that you want investigated.
- Nobody knows your business premises better than you, so make sure you show the auditor around.
- Ask questions as you go. Get them to explain your energy saving options as you walk around your business premises.
- When you get the written report, make sure you ask your energy auditor questions about anything you don't understand.<sup>9</sup>



<sup>9</sup> These tips have been adapted from [EnergyCut.info/audit-tips](http://EnergyCut.info/audit-tips)

**S**PECIFIC

**M**EASURABLE

**A**CHIEVABLE

**R**EALISTIC

**T**IMELY



## STEP 3

# Write an energy reduction plan

Now that you've seen what you're spending on energy (Step 1), and exactly where the energy is being used (Step 2), your next step is to systematically identify the ways that you can reduce your energy use and costs.

When you measured your energy use, perhaps you saw that your equipment accounted for most of your energy expenditure? Maybe it was your HVAC or lighting? You can now use this information to work out what areas to concentrate on and prioritise when you're writing your energy reduction plan.

**Rising energy costs can have a big impact on small businesses.**

**But what if you could reduce your energy costs by 20%?**

**For many small businesses, energy savings of 20% are an achievable goal. With an energy bill of \$10,000 a year, for example, \$2,000 could be saved. But to achieve this, you need a plan. How much could you save if you reduced your energy bills by 20%?**



# Did you know?

## Step 3: Plan

Writing an 'energy reduction plan' will help you to prioritise and implement the solutions that will reduce your energy costs.

See page 33

You will need to revisit your energy reduction plan on a regular basis to check that you're on track to reduce your costs.

See page 48

Hold a staff meeting to brainstorm energy reduction ideas. Also speak to your suppliers and contractors about your plans, as they may have ideas that could reduce your energy bills.

See page 46

Taking the advice of outside experts, such as qualified electricians or plumbers, will help you to prioritise your actions. Check if there are accredited EcoSmart Electricians in your area.

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### Your Energy Reduction Plan

The 'Energy Reduction Plan' template allows you to create your own blueprint for reducing energy use and saving money.

EnergyCut

DO SOMETHING!

AMERICAN CONTRACTORS  
INSTITUTE OF SAFETY AND HEALTH

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When beginning an energy reduction plan, one common mistake businesses make is failing to establish a baseline as to how much energy has been used.

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Visit [EnergyCut.info/erp-template](https://EnergyCut.info/erp-template) and download the Energy Cut 'Energy Reduction Plan'. This template checklist will make it easier for you to create your plan.

See page 38

Having the right monitoring tools will give you a better understanding as to where you're using energy.

See page 49

A useful way to measure the progress of your plan is to create a set of 'key performance indicators' (KPIs). These can be an effective way to set goals and communicate progress.

See page 47

It's vital to establish a baseline and to set a realistic energy reduction target. When making a plan, make sure your targets are 'SMART': Specific; Measurable; Achievable; Realistic; Time-bound.

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# In this step

- ▶ **What is the purpose of writing an energy reduction plan?**
- ▶ **Overview of the planning process**
- ▶ **How to write your own energy reduction plan**
- ▶ **Other things to do while writing your plan**
- ▶ **Using your plan to track your progress**
- ▶ **How to make sure your energy reduction plan succeeds**



## What is the purpose of writing an energy reduction plan?

For many busy small business owners, writing an energy reduction plan may feel like too much hard work. However, time invested in developing a plan improves your chances of maximising your energy savings and improving your bottom line.

Writing an energy reduction plan has the following benefits:

- It formalises your intentions and helps you to commit to them.
- It breaks down your goals into achievable steps.
- It forces you to set priorities thereby creating a strategy.
- By putting due dates on certain steps, it helps you to stay focused.
- By tracking your progress you are able to keep evolving your plan, using actual data from your business.
- By sharing your plan and reporting on it regularly, it provokes action.

### How writing down your goals helps you achieve them

A university study by psychology professor Dr Gail Matthews looked at “how goal achievement in the workplace is influenced by writing goals, committing to goal-directed actions, and accountability for those actions”.<sup>1</sup> Of five groups, the group that wrote down their goals, made action commitments, and sent regular progress reports to another person, were able to complete an average of 76% of their goals, compared to the 43% success rate for the group who only thought about their goals.

1 Dominican University of California [EnergyCut.info/dominican-research](https://www.energycut.info/dominican-research)



# Overview of the planning process

This chapter will describe all the actions you need to take to create your own customised energy reduction plan. In brief, the main actions are as follows:

- 1) **Set a baseline:** Firstly, you need to set a baseline for your annual energy use. By adding up the amount of electricity, gas and fuel that you have used over the previous 12-month period, you'll be able to assess the effectiveness of the changes that you'll be making. This is also necessary to be able to calculate the payback period of any energy reduction investments you've made.
- 2) **Prioritise your actions:** You'll then need to identify and prioritise the energy reducing actions that best suit your business in the short, medium and long term.

The steps in this book detail the immediate no-cost and low-cost actions that the average small business can easily implement straight away. When it comes to investing in energy efficiency upgrades, many small businesses have had an excellent ROI by prioritising their initial investments into energy efficiency lighting upgrades. You may want to do the same.

- 3) **Set a target:** By setting an energy reduction target – and a date by which to achieve your target – you'll have a concrete goal that your team can work towards.

Setting realistic targets increases the likelihood of their success, so incorporating the above information into your plan is critical. Additionally, if you don't measure and monitor your energy use, you won't be able to assess the effectiveness of your plan.

## Set realistic targets

When making a plan, make sure that your targets are 'SMART':

**Specific:** well-defined and clearly understood

**Measurable:** measure your progress against a baseline

**Achievable:** ensure that your target is attainable

**Realistic:** don't set the bar too high – set a realistic target

**Time-bound:** have a deadline by when your target should be reached







# Use our 20 steps to create your energy reduction plan

Step	Title	How this step helps with your energy reduction plan
1	<b>Add up your energy costs</b>	Implementing this step will give you your total energy usage and costs for the last year. These will become the baseline figures for your plan.
2	<b>Measure your energy use</b>	<p>The monitoring devices in this step will identify the appliances and equipment that use the most energy in your business.</p> <p>Putting this data in your plan will enable you to make better decisions when it comes to buying new equipment and reducing energy use.</p>
3	<b>Write an energy reduction plan</b>	Writing an energy reduction plan will enable you to identify and prioritise the specific actions you need to take to reduce your energy use. It also enables you to track your progress.
4	<b>Get your staff on board</b>	This shows you how important it is to educate, empower and involve your staff in effectively reducing energy consumption.
5	<b>Negotiate a better energy deal</b>	This shows you how to go about getting a cheaper deal from an energy retailer.
6	<b>Switch off and save</b>	This is the easiest way to save money. This step gives your plan a list of the many things that can be switched off when they're not in use.
7	<b>Watch your thermostat</b>	Using thermostats wisely is one of the simplest ways to reduce your heating and cooling bills. This step shows you how.
8	<b>Cut your lighting bills</b>	This step shows you the energy saving alternatives to your current lighting set-up. Prioritising this step and investing in lighting upgrades is an easy and cost-effective way to reduce your bills.
9	<b>Lower your heating, ventilation and air-conditioning costs</b>	This step is a key priority area. It shows you how to reduce the running costs of your existing heating, ventilation and air-conditioning equipment and how to go about replacing it with more cost-effective alternatives.
10	<b>Get comfortable with insulation</b>	Insulation is one of the cheaper investments you can make to reduce your energy bills. A well-insulated business can significantly reduce its heating and cooling costs. This step will take you through the options including, ceiling, wall and window insulation as well as the importance of stopping drafts.



Step	Title	How this step helps with your energy reduction plan
11	<b>Cut your IT energy costs</b>	Using a laptop instead of a desktop and monitor, can reduce your computer energy consumption by up to 80-90%.  Changing your energy-saver settings, monitor brightness and printer set-up are just some of the other cost-saving actions that this step identifies for your plan.
12	<b>Reduce equipment energy costs</b>	This is a key part of your plan. Choices around replacing, repairing or reorganising your equipment can lead to significant savings. This step also covers the importance of maintenance, energy star ratings and the efficient use of equipment.
13	<b>Save money on transport</b>	Vehicle choice, maintenance, organising trips to reduce fuel use, tyres and improved driving technique are just some of the ways to lower your transport costs. This step shows you how.
14	<b>Cut your refrigeration costs</b>	Most refrigeration equipment has to run 24 hours a day. This important step shows you how equipment choice, placement, maintenance, insulation and the use of natural refrigerants can significantly reduce your refrigeration costs.
15	<b>Reduce hot water costs</b>	The way you generate hot water can have a big impact on your energy bills. Hot water temperature settings, maintenance, insulation, and the wastage of hot water can also affect your running costs. Putting our solutions into your plan will cut those costs.
16	<b>Save money with solar</b>	Investing in solar can reduce the impact of rising energy prices. This step will show you the solar options that can be incorporated into your plan, including solar hot water, solar electricity and solar battery storage.
17	<b>Energy efficiency and your building lease</b>	If your business doesn't own its own premises, we'll show you how that shouldn't stop you from improving the energy efficiency of your building.
18	<b>Financing your upgrades</b>	If you want to maximise your energy efficiency, but can't afford the upfront capital cost, this step will show you the various funding options that may be available to your business.
19	<b>Look out for innovation</b>	When it comes to energy efficiency, new products, ideas and innovations are coming out all the time. This step shows you why your plan will benefit from being on the look out for energy efficiency innovation.
20	<b>Further information</b>	There are organisations, government bodies and experts that can help your business to reduce its energy use. This step will provide you with the contacts who can help you with your energy reduction plan.

## 2) Gather up your tools

Before you start writing your energy reduction plan, you need to do the following:

- Download our 'Energy Reduction Plan' template from [EnergyCut.info/erp-template](https://EnergyCut.info/erp-template). You will need to have this to hand when you're reading the book. This template will become the basis of your written plan.
- You will need your last four quarterly gas and electricity bills. By adding up the kWh of electricity and MJ of gas that you have used in the previous year, you'll have the information you need to set a baseline and track your progress. If you've mislaid your bills, you can call up and have them re-sent by your energy company.
- You also need to read the odometer in your vehicle(s). By inputting the kilometres that your company vehicles have travelled in the past year, our calculator at [EnergyCut.info/bills-calculator](https://EnergyCut.info/bills-calculator) will show you how much fuel you've used and how much it's cost you. This will give you a baseline for fuel costs and consumption.

**Handy Tip:** If you're reading a hard copy version of this book, it's also available as a free searchable PDF. Download it from [EnergyCut.info/SME-book](https://EnergyCut.info/SME-book)

## 3) Fill in the 'Energy Reduction Plan' template

The 'Energy Reduction Plan' template allows you to create your own blueprint for reducing energy use and saving money.

You can download it here: [EnergyCut.info/erp-template](https://EnergyCut.info/erp-template)

Go through the template step by step and fill in the tables and checklists. You'll also need to revisit the document to update it and to monitor your progress.

The 'Energy Reduction Plan' template is divided into three sections. Each section relates to different steps in the Energy Cut book:





## Section 1: Your present situation (Steps 1-3)

**Your business's present situation.** This is where you'll record your business's current energy use and costs. This part of your plan will also show you where the energy is being used and by what equipment.

**Baseline energy use.** There are two ways to use baseline figures:

- **Annual comparison:** If you created your baseline energy figure in March 2015, you will compare your future energy use with that figure. For example, "Compared to our March 2015 baseline figure, we have now reduced our energy use by 12%."
- **Seasonal comparisons:** Comparing your winter bill with the previous winter bill; or your busy season bill with the one from the same period the year before - will show you whether your energy costs are coming down.

**Overall reduction goal.** Within the template plan, this is where you can nominate a reduction goal. This can be expressed as:

- a dollar figure
- a percentage of the baseline figure
- a key performance indicator (KPI) that reflects what kind of business you're in. For example, if you own a bakery, your energy reduction goal might be to reduce your energy use for each 1,000 loaves of bread you bake. See later in this step for how to establish a KPI.

## Section 2: What changes can you make? (Steps 4-18)

**Creating an energy reduction culture in the workplace.** Your plan needs to detail the ways in which you get your staff and stakeholders on board.

**Potential areas for energy savings.** Your plan needs to identify the changes that you are going to make. This section shows you how to examine and reduce the energy used by your:

- lighting
- HVAC
- IT and equipment

- transport
- refrigeration
- hot water.

It will also show you how to switch to a better energy deal and how to seek out a building lease that takes energy efficiency into account.

This section is where you will record the areas where your business could make energy efficiency improvements through:

- no cost behavioural changes in the workplace
- low cost investments
- more significant investments in energy efficiency upgrades.

**Priority saving initiatives.** This is where you will record the first actions you want to take. For example, if your audit showed that HVAC was responsible for most of your energy waste, you would prioritise this as one of your first actions.

**Short and long term implementation plans.** This is where you will record the order in which you will be making changes.

### Section 3: Monitoring your progress and staying informed (Steps 3, 19 & 20)

**Monitoring and revising your plans.** This is where you can record your energy usage and energy costs after you have made changes. This way you can see how much you are saving and relate it to your goals.

**Staying informed and seeking external advice and help.** This part of the plan is where you will record the organisations who may be able to give you additional help. Part of your planning should be to look out for innovative equipment that may be able to reduce your energy bills.



## 4) Getting help with your plan

When pulling together your energy reduction plan, there are outside people who can help you:

- A plumber or electrician who already knows your business premises can give you valuable advice.
- An EcoSmart Electrician specialises in energy efficiency. You can find one here: [EnergyCut.info/eco-smart](https://EnergyCut.info/eco-smart)
- If you use a lot of power, an energy auditor can give your business an energy efficiency audit.
- See 'Step 2 - Measure your energy use' for information on how to organise an energy audit or energy review.

### Richmond Bakery, TAS

“The first thing you need to do is get an audit done,” said Richmond Bakery owner David Kay, who went on to make an energy reduction plan that is now saving him \$1,600 per year on energy bills.

“The auditors will give a very precise reading on each piece of equipment, such as how much energy is consumed, what part of the day it’s consumed and how you can make adjustments to reduce those energy costs.”<sup>3</sup>

Could an energy audit at your business help you to find where your energy is being wasted? Hire an energy auditor to do it for you, or do your own audit using our downloadable ‘Energy Reduction Plan’ from [EnergyCut.info/erp-template](https://EnergyCut.info/erp-template).



<sup>3</sup> [EnergyCut.info/bakeries-case-study](https://EnergyCut.info/bakeries-case-study)

## 5) What if your tradespeople don't understand energy efficiency?

If your current plumber or electrician is not up to speed with the latest developments in energy efficiency, then it may pay to replace them.

In the first instance, check if there are accredited EcoSmart Electricians and energy efficiency trained plumbers in your area. If there aren't, look out for qualified tradespeople who can demonstrate prior experience in this area.

### How to locate an EcoSmart Electrician

An EcoSmart Electrician is a licensed electrical contractor who has undertaken additional training to become certified and accredited in energy efficiency.

EcoSmart Electricians are professionally trained in different aspects of energy efficiency including energy management, lighting, heating/cooling and motors/pumps. Many are also qualified to install solar PV systems.

They can also give you professional help with your energy reduction plan.

To find out more, call EcoSmart Electricians on 1300 300 031.

You can also search for a local EcoSmart Electrician by typing in your postcode at:

[EnergyCut.info/eco-smart](http://EnergyCut.info/eco-smart)



**EcoSmart**Electricians™





## Energy efficiency trained plumbers and how they can help you

When booking any plumber, you first need to check that they are fully licensed, accredited and insured.

An energy efficiency trained plumber can help you to choose the most efficient products and appliances for your business. They can also assist you with the development of your energy reduction plan.

These plumbers should have been trained in:

- hot water heating
- products that are water efficient
- heating and cooling appliances
- solar hot water installation and maintenance
- water conservation
- emerging technologies.



They should be able to help you make cost-effective decisions in your energy reduction plan. To locate a trained plumber in your state or territory, visit the following weblinks:

**NSW – Master Plumbers Association of NSW**

[EnergyCut.info/plumbers-nsw](https://EnergyCut.info/plumbers-nsw)

**VIC – Master Plumbers Association**

[EnergyCut.info/plumbers-vic](https://EnergyCut.info/plumbers-vic)

**QLD – Master Plumbers’ Association of Queensland**

[EnergyCut.info/plumbers-qld](https://EnergyCut.info/plumbers-qld)

**WA – Master Plumbers & Gasfitters Association of WA**

[EnergyCut.info/plumbers-wa](https://EnergyCut.info/plumbers-wa)

**TAS –The Master Plumbers’ Association of Tasmania**

[EnergyCut.info/plumbers-tas](https://EnergyCut.info/plumbers-tas)

**ACT – Master Plumbers ACT**

[EnergyCut.info/plumbers-act](https://EnergyCut.info/plumbers-act)

**SA & NT - Master Plumbers South Australia**

[EnergyCut.info/plumbers-sa-nt](https://EnergyCut.info/plumbers-sa-nt)

## Other ways to locate electricians and plumbers with energy efficiency training

- Talk to local businesses that have had an energy efficiency upgrade. They may be able to recommend the tradespeople they used.
- Talk to friends who’ve upgraded the energy efficiency of their home. They could give you the name of their electrician or plumber.
- Your local chamber of commerce may also know tradespeople or organisations who are experienced in implementing or maintaining energy efficient equipment.

These personal recommendations can give you credible information about local tradespeople who genuinely understand energy efficiency.



## Other things to do while writing your plan

### Show management commitment

As a business owner or manager, you need to:

- commit to understanding how your business uses energy and how you can reduce it
- give one of your staff members the time and authority to organise your energy reduction plan. You also need to put someone in charge of implementing it. This person may be you!
- commit to an energy-use reduction target. This is a good way to engage your staff in reducing the energy use in your business
- be clear with your staff about the specifics of what you intend to change and how it will affect them. Fully engage them with your plans. More advice on this is given in 'Step 4 - Get your staff on board'.

### St Andrews Village, NSW

When it comes to energy efficiency improvements, CEO at St Andrews Village, Pip Carter, says it's important to get buy-in from management and the board: "To generate significant long-term savings you often need to invest in new equipment, which can be quite costly," said Carter. "To get your initiatives across the line, pitch the benefits to the Board from a business point of view, in terms of cost savings and payback periods for any new equipment."<sup>4</sup>

<sup>4</sup> [EnergyCut.info/andrews-village](http://EnergyCut.info/andrews-village)

## Tell people about your intentions



Hold a staff meeting to brainstorm energy reduction ideas. Also speak to your suppliers and contractors about your plans, as they may have ideas that could reduce your energy bills.

When you have gathered up the best ideas, write a briefing document that informs your staff, suppliers and contractors about your new energy reduction plans. In terms of content, this document should state that your business:

- is seeking to lower its energy bills (if you have an energy reduction target, put it in)
- wishes to improve its overall energy efficiency
- welcomes additional ideas that will reduce energy use.

The document should be kept short and to the point – ideally no longer than one side of an A4.

Your policy also needs to be a standing item at any staff meetings – use it to assess how you are doing against your goals. It can also be included in employment contracts, employee inductions and tender documents.



## Establish key performance indicators (KPIs)

When it comes to reducing energy use, tracking your energy bills and energy usage is the easiest way to measure your progress. For many small businesses, this information will suffice.

Another useful way to measure your progress is to create a set of 'key performance indicators' (KPIs). These can be an effective way to set goals and communicate your progress to staff, investors and stakeholders.

The types of KPIs you choose can be designed to reflect your type of business.

- If you own a café, an indicator may be energy used per 1,000 customers served.
- If you run a bakery, it could be energy used per 1,000 loaves of bread.
- If you are an office-based organisation, it may be the amount of energy used per employee or annual energy use for each square metre of office space.
- You could also measure the amount of energy used for each \$10,000 of turnover.

### Wynnum North Newsagency, QLD

After liaising with Queensland Newsagents Federation, Wynnum North Newsagency introduced energy efficiency measures that saved them over \$1,750 p/a.

Co-owner John Allen conducted an energy audit of his premises by simply walking around his store and identifying areas where they could make savings. He also spoke to other newsagents about what they were doing to save energy. This helped the business to develop a plan that reduced their energy bills.<sup>5</sup>

<sup>5</sup> [EnergyCut.info/newsagencies-case-study](http://EnergyCut.info/newsagencies-case-study)

## Using your plan to track your progress

Revisiting your plan on a regular basis will help you to keep on track with your energy reduction measures.

- **Tracking by billing cycle:** Go back to your plan every time you receive your quarterly energy bill. By writing down and comparing each bill with the one you received 12 months ago, you can see how you're tracking in reducing your energy costs.
- **Tracking by season:** Tracking your bills on a seasonal basis is another good way to monitor progress. This way you can directly compare your winter heating bills or summer cooling costs on a year-on-year basis.
- **Monitor your energy use:** Using the measuring techniques outlined in Step 2, put reminders in your calendar to track your energy use on a monthly, quarterly, or annual basis. This information will tell you if your plan is succeeding in reducing energy use.
- **Track your appliance energy use:** Your plan should detail the amount of energy used by your key appliances (the way to do this is detailed in Step 2). If your energy monitoring tools show that they are starting to use more energy, you may need to get them serviced or replaced.
- **Tracking newly-installed equipment:** When you install new energy efficient equipment or lighting, log its energy use and anticipated savings in your plan. Then use your energy monitoring tools to see if you're saving the money you anticipated. If not, there may be an installation issue or equipment failure.

### Milner Meat and Seafood, NT

An energy audit revealed that Milner Meat and Seafood were using the energy equivalent of 25 average Alice Springs households. This motivated them into planning changes that are now saving them \$7,500 a year on their energy bills.<sup>6</sup>

<sup>6</sup> [EnergyCut.info/milner-meat-seafood](https://EnergyCut.info/milner-meat-seafood)



## How to make sure your energy reduction plan succeeds

When it comes to improving your energy efficiency, there are some common mistakes that businesses make. These include:

- ▶ **Failure to measure your energy use (don't skip this step!)**
- ▶ **Lack of adequate tools to measure energy use**
- ▶ **Not using energy monitoring to assist with decision making**
- ▶ **Energy efficiency equipment not performing to expectation**
- ▶ **Failure to properly measure lifetime energy costs**

### Failure to measure your energy use (don't skip this step!)

When beginning an energy reduction plan, one common mistake businesses make is failing to establish a baseline as to how much energy has been used.

It's important that you don't just add up the overall dollar cost of your bills. It's critical that you also measure the amount of electricity and gas that your business used in the previous year.

### Lack of adequate tools to measure energy use

As we explained in Step 2, it pays to monitor the way in which you use energy across all areas of your business. Having the right monitoring tools will give you a better understanding as to where you're using energy. The benefits for your plan include:

- improved ability to measure the success of your energy efficiency initiatives
- reducing the risk of your energy use creeping back up
- holding your tradespeople to account as these tools can measure whether their changes are working
- holding new equipment suppliers to account, as monitoring can verify whether their equipment is achieving its stated energy reduction claims.

## Not using energy monitoring to assist with decision making

Some energy saving projects have failed because the businesses were unable to measure the effectiveness of their energy saving initiatives.

As an example, one business painted a roof white but were unable to measure whether this reduced their air-conditioning costs. When their energy bill failed to go down, the assumption was that their white roof initiative had failed; however, it was an increase in energy use in an unrelated area that stopped their bill going down.

Their inability to measure where the increased energy use was taking place led to the company cancelling other energy reduction initiatives.

This underlines the importance of being able to measure where your energy use is taking place. For companies who use a lot of energy, this is one of the benefits of sub-metering and other energy monitoring tools.

Talk to an EcoSmart Electrician as to whether it makes financial sense for you to sub-meter your business.

## Energy efficiency equipment not performing to expectation

Before you install any energy efficient appliance, equipment or lighting, it pays to ask your tradesperson or equipment supplier the right questions.

Questions to ask could include the following:

- Has this piece of equipment successfully reduced energy in other businesses? Can you give me an example? Do you have testimonials or evidence from satisfied customers that this product works as claimed?
- Where you've installed it elsewhere, has it reduced energy use to the levels it says it will? Can that be backed up with proof?
- If the manufacturer claims that the equipment reduces energy use by 50%, what proof do they have that the equipment achieves this energy saving in the real world?
- If the manufacturer claims that the equipment has a certain lifespan, what proof can they offer?





- Does the lighting perform as claimed? When it comes to long-life lighting, you need to ensure that you're installing a reliable brand. If the advertising claims that the LED lighting lasts for 50,000 hours, what proof do they have that it can achieve this? Is this LED product listed at the SSL Quality Scheme website? [EnergyCut.info/ssl-quality-scheme?](https://www.energycut.info/ssl-quality-scheme/)
- Does it have a guarantee? If the equipment does not perform properly or fails, who will bear the cost of replacing it? A guarantee will give you more security when it comes to receiving a financial payback.

### Mittagong RSL, NSW

Mittagong RSL and its services underwent an energy audit and used that to formulate an energy reduction plan.

“That report gave us a series of guidelines as to where we could start addressing and improving our energy efficiency, and associated ROIs,” said Operations Manager Daniel Marmont. “From there, we formulated a priority plan as to which areas we would look at, based on capital expenditure required, business needs, and time frame of improvement.”<sup>7</sup>



<sup>7</sup> [EnergyCut.info/rsl-clubs-case-study](https://www.energycut.info/rsl-clubs-case-study)

## Failure to properly measure lifetime energy costs

You should ask the following questions when getting a quote:

- Can you include the purchase price as well as the lifetime running costs for this piece of equipment in my quote?

This will give you the real cost of the equipment. You can use this information when comparing the options available to you.

- Can you give me a written statement regarding how long you expect this equipment to last?

For example, you may get a better financial return from installing lighting that is more expensive to purchase, but achieves a better reduction in energy use over a longer period. Long-life equipment can also reduce replacement costs.

Sometimes, a contractor or tradesperson may offer to install a certain type or brand of equipment because they get a better mark-up from the distributor or manufacturer.

If they only offer you one option, ask them if they can give you costings for different brands of equipment that do the same thing.

For example, if you're getting a lighting quote, get them to quote with different brands of lighting. Where possible always ensure that some of them are well-known brands.

### Le Breton Patisserie, NSW

Following an energy audit, Le Breton Patisserie owner Dominic Le Breton started implementing his energy reduction plan which recommended that he focus on rationalising refrigeration – in doing so he achieved a 20% energy saving. “My advice to other businesses... is to work out your priorities,” he said.<sup>8</sup>

<sup>8</sup> [EnergyCut.info/breton-pat](http://EnergyCut.info/breton-pat)



Put your  
**plan**  
into **action**





## STEP 4

# Get your staff on board

**Creating a culture that promotes energy saving in your business is important, because employees tend to go with the flow of what everyone else is doing. If their colleagues leave equipment turned on at the end of the day, then so will they. You, as management, should lead by example.**

When you communicate your energy efficiency plan to your staff, the information needs to be practical and relevant. They also need to be trained about their role in implementing the plan.

Positive communication and good training will lead to better staff participation and better savings on your energy bills. Linking energy use reductions to staff performance reviews and bonuses is another way to maximise your savings.



# Did you know?

## Step 4: Staff

Linking energy use reductions to staff performance reviews and bonuses can help to maximise your savings.

See page 55

Positive communication and good staff training can lead to better staff participation and better savings on your energy bills.

See page 55

Set a target.

If you want to reduce energy use by 10%, be very clear about what you want to achieve. Your energy reduction targets also have to be 'SMART': Specific, Measurable, Achievable, Realistic and Time-based.

See page 60

Get your staff to design 'switch-off' messages that are printed onto adhesive stickers and placed next to light switches, hot water urns, monitors and other electrical devices.

See page 63



See page 59

**Computers need sleep too**



See page 64

**Pulling together as a team to save energy can help to improve collaboration skills and staff morale.**

See page 59

**When you're trying to get staff on board to reduce energy bills, remember to be patient – ingrained habits take time to unlearn.**

See page 65

**Lizards Early Learning Centre reduced their summer bills by educating all the children, staff and parents on energy efficient practices.**

See page 63

**Achieving results with your energy reduction plan tells stakeholders and clients that your company is well run.**

See page 61

**Switching off when you knock off...**



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# In this step

- ▶ **Creating an energy-saving culture in your team**
- ▶ **Rewarding and recognising your staff**
- ▶ **How to roll out your energy saving communication plan**
- ▶ **Distribute an energy saving info sheet to your staff**
- ▶ **Place 'switch-off' posters and stickers around your workplace**
- ▶ **Be patient and encouraging with your staff**





## Creating an energy-saving culture in your team

A strong focus on energy saving is a key part of running a SME efficiently. It's also a great way to build your team.

- Pulling together as a team to save energy can help to improve collaboration skills and staff morale.
- Invite your staff to submit their best energy saving ideas. Staff members who come up with ways to reduce your energy bills will encourage others to follow their example.
- If your staff learn how to reduce their energy use at home, they're more likely to reduce it at work. One initiative they can take part in is 'The 10% Challenge' at [10PercentChallenge.com.au](http://10PercentChallenge.com.au). This website shows your staff how to reduce their home energy bills by 10% or more.

## Rewarding and recognising your staff

Some companies provide financial bonuses for individuals or teams who help to reduce energy use. This can really boost staff morale.

- For staff members who are implementing your energy reduction plan, why not encourage them by linking their results to their performance reviews?
- You can also set up a staff bonus scheme that is linked to reductions in energy use.
- Finally, you should never underestimate the power of chocolate! If a member of staff turns off their computer when going out for lunch, leave a chocolate on their keyboard. It sends them the message that you've noticed and are grateful for their energy saving action.



# How to roll out your energy saving communication plan



When running an energy saving campaign with staff, there's a lot you can do.

- **Set a target** – be very clear about what you want to achieve. If you want to reduce energy use by 10%, then say so clearly to your staff. Your energy reduction targets also have to be 'SMART': Specific, Measurable, Achievable, Realistic and Time-based.
- **Put a deadline on your target** – challenge your staff to achieve the energy saving by a set date.
- **Use plain English** – don't use language that your staff won't understand. Make sure that your energy saving messages are easily understood by all.
- **Use effective communication** – how will you communicate with your staff?
  - A lighting campaign, for example, might be best served by placing signs near all light switches and posters by the exit doors.
  - You can also put energy saving reminders on all inter-company emails.
- **Put someone in charge** – who is going to manage and run your energy saving campaign? If someone reports a hot water leak or other problem, will this be the person who gets it fixed?



- **Give staff a feedback mechanism** – if you're putting up energy saving posters, tell people who to contact if they spot a problem. This could also be the person who staff go to if they have an energy saving idea.
- **Communicate the results** – when you save energy and money, tell your staff about it. It will demonstrate that everyone's effort is achieving something. It could also encourage people to become more involved.

## Pacific Restaurant Group

The Pacific Restaurant Group found that electricity and gas savings of up to 12% were coming from their restaurants that had undertaken training in reducing energy use.

As a result, they are now reporting energy saving results back to their staff on a monthly basis.<sup>1</sup>

- **Report your results** – why not report your energy saving results back to your stakeholders or customers? Achieving results with your energy efficiency plan tells others that your company is well run.
- **Let everyone know!** Who else needs to know? If you've achieved a very positive result, why not report it to your local newspaper? People like to hear energy saving success stories and it's good publicity for your business.

## Ferguson Plarre Bakehouses, VIC

An energy monitoring system enables 'real time' monitoring of electricity and gas consumption at Ferguson Plarre Bakehouses. By displaying this data on a screen in a high-traffic corridor, this raises staff awareness and motivates them to become even more energy efficient.<sup>2</sup>

<sup>1</sup> [EnergyCut.info/restaurants-cafes-case-study](http://EnergyCut.info/restaurants-cafes-case-study)

<sup>2</sup> [EnergyCut.info/ferguson-bakehouses](http://EnergyCut.info/ferguson-bakehouses)

## Distribute an energy saving info sheet to your staff

When your company is rolling out its energy reduction plan, your staff need to be fully aware of the things they can do to save energy.

When you have identified the energy saving actions that require staff involvement, put these actions into an easy-to-understand information sheet that you email or hand out.

### Craft Victoria, VIC

Craft Victoria implemented the following behavioural changes in order to ensure that energy efficiency practices became part of the organisational culture:

- forming staff teams
- reviewing and tracking monthly energy bills against goals and communicating them to staff
- placing stickers and signage around the office to encourage staff to switch off appliances when not in use, and
- including energy efficiency procedures as part of the new staff induction process.<sup>3</sup>

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<sup>3</sup> Sourced from a CitySwitch case study: [EnergyCut.info/craft-vic](https://www.energycut.info/craft-vic)



## Place 'switch-off' posters and stickers around your workplace

Placing energy saving posters and stickers around your workplace will act as a constant reminder to staff to switch off and save money.

Why not get your staff to design 'switch-off' messages that are printed onto adhesive stickers and placed next to light switches, hot water urns, monitors and other electrical devices?

### Lizards Early Learning Centre, QLD

Lizards educated all the children, staff and parents on energy efficient practices. "We have signs everywhere telling people to switch off lights, not to fill the kettle and to boil only what they need. Even with the CD player, we used to have music running all the time but now we only have it on when we're listening," says Centre Manager Kristen Fox.

Lizards Early Learning Centre has saved 35% on their summer energy bills. This has been achieved at very little cost.<sup>4</sup>



<sup>4</sup> [EnergyCut.info/childcare-centres-case-study](http://EnergyCut.info/childcare-centres-case-study)

<sup>5</sup> Poster courtesy of News Corp: [1degree.com.au](http://1degree.com.au)


## LJ Hooker, NSW

Following a voluntary audit, one of their top performing offices, LJ Hooker Mosman/Neutral Bay, achieved 19% savings in one year after implementing the recommended changes.

“One of biggest challenges was re-educating our staff and their thinking. Even simple things like switching lights off when leaving the office,” said Director Richard Harding. “One of the largest benefits to us is the reduction to our overheads. I see this program as the future. It’s not just a trend or fad.”<sup>6</sup>



LJ Hooker 3Ps  
**Paper Power Petrol**  
Driving Efficiency



- Turn off your computer and screen monitors at the end of the day
- Use scrap paper when printing in house
- Switch off any unused power points or lights

## Computers need sleep too



Putting your computer to sleep when you leave the office is one step you can take that adds up to big change



Find out what steps we are taking at [1degree.com.au](http://1degree.com.au)

<sup>6</sup> [EnergyCut.info/LJ-Hooker](http://EnergyCut.info/LJ-Hooker)

<sup>7</sup> Poster courtesy of News Corp: [1degree.com.au](http://1degree.com.au)



### Richmond Bakery, TAS

“We are encouraging our staff to develop ideas on how we can become more energy efficient in the business,” said Richmond Bakery owner David Kay. “Staff then feel more responsible about the business and enjoy it being part of their lives.” Richmond Bakery saved \$1,600 a year with this and other energy efficiency measures.<sup>8</sup>

## Be patient and encouraging with your staff

When you're trying to get your staff on board to reduce your energy bills, remember to be patient – ingrained habits take time to unlearn.

Encourage your employees in a very positive way. When you get a lower energy bill, make sure to thank and reward them for the result.

### Mittagong RSL, NSW

One of the methods by which Mittagong RSL saved 25% a year on energy was by appointing a third party to conduct a staff engagement process.

“This brought staff on board and gave them insight as to why this path was taken and what the goals were from a business point of view,” said Operations Manager Daniel Marmont. To keep staff motivated, management gives them regular updates about energy savings so that they're aware of the positive impact of their actions.<sup>9</sup>

<sup>8</sup> [EnergyCut.info/bakeries-case-study](https://www.energycut.info/bakeries-case-study)

<sup>9</sup> [EnergyCut.info/rsl-clubs-case-study](https://www.energycut.info/rsl-clubs-case-study)







## STEP 5

# Negotiate a better energy deal

**The quickest way to save money on your energy bills is to switch to a cheaper energy deal.**

This step will show you how to reduce the bills that you get from your energy retailer. This involves calling them up to see if they can improve your deal or switching to another retailer who can give you a better offer. This chapter lists the questions you need to ask to ensure that you come out on top.

This step also discusses lesser known billing issues such as ‘time-of-use’ pricing; and how the type of meter you have can make a difference to how you’re billed and how much you pay.

Finally, we give examples of how some small businesses have been overcharged through incorrect billing and what they did to rectify it.

**If you use more than 100MWh of power a year, it may pay to take advantage of the expertise of an energy consultant, especially when moving premises, reviewing or negotiating energy contracts or changing your business operations.**



# Did you know?

## Step 5: Negotiate

Discounts of up to 15% or more are available to SMEs who call up energy retailers seeking a better deal.

See page 71

The type of meter you have can make a difference to how you're billed and how much you pay.

See page 67

'Time-of-use' pricing is the energy industry's version of 'early bird parking'. If you use energy at a time of day when less people are using it, you'll be charged less.

See page 80

If you use more than 100MWh of power a year, it may pay to use an energy consultant, especially when moving premises, reviewing or negotiating energy contracts or changing your business operations.

See page 67

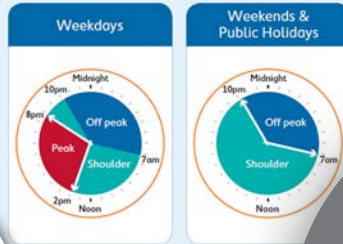


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**When calling up energy retailers, strengthen your negotiating position by telling them that you're shopping around for the best deal.**

**See page 71**



**See page 80**

**The owner of Jerilderie Motor Inn saved \$5,400 with one phone call to his energy company.**

**See page 73**

**If your energy retailer has you on the wrong tariff, you can end up paying charges that you don't need to pay. You should always check that you're being billed correctly.**

**See page 77**

**When you get your first energy bill after moving, compare the tariff on it with the last bill from your old premises. If you're operating in the same area and your operations are much the same, you should be paying the same tariff as before.**

**See page 75**

**Financial savings from switching energy retailers can be invested into energy efficiency improvements.**

**See page 73**



# In this step

- ▶ **Switching energy providers**
- ▶ **Questions to ask an energy provider**
- ▶ **Understanding your electricity and gas bills**
- ▶ **Understanding your energy contract**
- ▶ **Are you on the correct rates and tariffs?**
- ▶ **How meters can affect your bills**
- ▶ **Can you take advantage of 'time-of-use' pricing?**
- ▶ **How power factor control can reduce your bills**



## Switching energy providers

If you're not in a contract with your current energy retailer, then it pays to shop around for the best deal you can get. Discounts of up to 15% or more are available to SMEs who call up energy retailers seeking a better deal.

To get underway, gather up your bills from the last 12 months - this will enable you to answer any questions that they have about your previous energy use. When you've got a number of quotes, call your current energy retailer and see if they can better them.



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*When calling up energy retailers, strengthen your negotiating position by politely telling them that you're shopping around for the best deal.*

---

It's worth remembering that there's a 10-day 'cooling off' period when you sign a new energy contract. During this period you're entitled to change your mind and terminate the new contract at no cost.

After switching energy retailers, check your first bill to ensure you're billed the correct amount and receiving the promised discount.

To find a list of all the energy retailers in Australia, visit:

[EnergyCut.info/energy-made-easy-gov](https://www.energycut.info/energy-made-easy-gov)

### Guardian Early Learning Group, locations around Australia

By calling around different energy retailers, Guardian Childcare were able to get a 17% discount for each of their 50 childcare centres around Australia. Since then, they have begun an energy efficiency push that has so far reduced their overall energy use by 7%.<sup>1</sup>

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<sup>1</sup> [EnergyCut.info/dosomething-research](https://www.energycut.info/dosomething-research)

## Questions to ask an energy provider

**Important!** Before you call an energy provider or energy broker, make sure you read this chapter so that you fully understand concepts like tariffs and ‘time-of-use’ pricing.

When you’re ready to call, have one year of electricity and gas bills to hand. This will tell you how much you are currently spending and will be useful when it comes to negotiating a new energy rate. Here are the questions to ask.

### Energy efficiency questions:

- Can you help us to reduce energy use in our business?
- Can you give us a free energy audit and advice?
- Can you supply us with energy displays or ‘smart’ meters so that we can track our energy use in real time?
- Do you provide online energy monitoring?
- Can you supply or install energy efficiency measures that we pay for through our bills over a set period of time? For example, installing solar power, solar hot water, heat pump hot water systems or efficient lighting.
- Do you have other finance packages for installing equipment that reduces our energy bills?

### Contract and tariff questions:

- What are the best rates that you can offer our type of business? How many cents per kilowatt hour (c/kWh) for electricity and how many cents per megajoule (c/MJ) for gas do you charge?
- Do you offer ‘time-of-use’ tariffs or ‘off-peak’ rates where we pay less for energy that we use during non-peak times of the day? (See ‘*Can you take advantage of ‘time-of-use’ pricing?’*’ later in this step.)<sup>2</sup>
- Do we have to pay a peak capacity charge or maximum demand charge? (See ‘*Do you pay a peak capacity charge?’*’ later in this step.)
- How often will we be billed?

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<sup>2</sup> During certain hours, some energy providers can give you discounts on your energy costs. Specific sectors, such as bakeries that use much of their energy consumption early in the morning, can benefit from off-peak rates.



- Does the method of bill payment affect our costs? For example, if I pay our bill over the phone by credit card, will it cost more than paying it by direct debit?
- Are discounts available for paying our bill on time and do you charge extra for late payment? If our energy usage varies from before, can the plan charge us more in any way?
- Are there any connection or disconnection fees?
- Do we need to sign up to a contract? If so, for how long? Do we have to pay any fees if we want to terminate before the end of the contract period?
- What happens at the end of the contract period? Does the plan change in any way?
- What price can you pay for solar energy that is generated at our business?
- Will my current tariff change if I install solar?

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## *Financial savings from switching energy retailers can be invested into energy efficiency improvements.*

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### **Jerilderie Motor Inn, NSW**

In June 2015, David Green, the owner of Jerilderie Motor Inn, attended an Energy Cut speech by Jon Dee.

On returning to his motel, he called up his energy provider and told them his bill was too high and that he wanted to change to another energy company. He was immediately offered a significant discount.

"They said from today's date they would give us 18% off our bill for 24 months. I agreed to this as it is a great saving for my business," said David. "My power bill per year is \$15,000, so over the next 2 years that will give me a saving of \$5,400."

How much can you save just by calling up your energy company and asking for a better deal?

# Understanding your electricity and gas bills



The Australian Energy Regulator has created a useful guide that will help your business to understand its energy bills. If you're confused by energy fees and tariffs, visit [EnergyMadeEasy.gov.au](http://EnergyMadeEasy.gov.au).

This site is ideal for businesses that do not have a capacity charge on their bill (see 'Do you pay a peak capacity charge?' later in this step)

For information on how to read your electricity and gas bills:

**Electricity** - [EnergyCut.info/how-to-read-bill](http://EnergyCut.info/how-to-read-bill)

**Gas** - [EnergyCut.info/how-to-read-gas-bill](http://EnergyCut.info/how-to-read-gas-bill)

The Australian Energy Regulator also explains energy bills here: [EnergyCut.info/aer-energy-bills-explained](http://EnergyCut.info/aer-energy-bills-explained)





### What is a tariff?

A tariff is the price that you pay for your energy. It includes a fixed charge and a variable charge. The Australian Energy Regulator defines these charges as follows:

**The fixed charge:** also known as the 'service charge' or 'daily supply charge', is a charge that applies for supplying electricity or gas to your premises for each day of your billing period, regardless of how much electricity you use. It is often displayed as a daily rate on your bill in cents per day.

**The variable charge:** also known as the 'usage charge' or 'consumption charge', is listed as cents per kilowatt hour (c/kWh) for electricity and cents per megajoule (c/MJ) for gas.

When comparing offers, you should review both of these charges. The Energy Made Easy website also explains the different tariffs that can be included in the variable charge on your bill: [EnergyCut.info/eme-tariffs](https://www.energycut.info/eme-tariffs)

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*When you get your first energy bill after moving, compare the tariff on it with the last bill from your old premises. If you're operating in the same area and your operations are much the same, you should be paying the same tariff as before.*

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## Understanding your energy contract

**Energy and your business.** If you want to get the best deal or sort out a problem, the Australian Energy Regulator has a web site that helps your business to understand energy and the rules that ensure you get a ‘fair go’ from retailers: [EnergyCut.info/aer-energy](https://www.energycut.info/aer-energy)

**Switching energy contracts.** The Australian Energy Regulator has a guide that shows you how easy it is to switch your contract from one energy retailer to another: [EnergyCut.info/aer-switching-contracts](https://www.energycut.info/aer-switching-contracts)

**Compare small business energy deals.** The Australian Energy Regulator has a page that enables small businesses in some states to compare electricity and gas offers from different retailers: [EnergyCut.info/compare-offers](https://www.energycut.info/compare-offers)

**Victoria also has an energy offer comparison service.**

Victorian gas comparison: [YourChoice.vic.gov.au](https://www.yourchoice.vic.gov.au)

VIC electricity comparison: [mpp.switchon.vic.gov.au](https://www.mpp.switchon.vic.gov.au)

**Solar contracts.** When it comes to solar tariffs, do you know the difference between a net versus gross feed-in tariff? Not everyone does, but understanding it could save you a lot of money should you decide to install solar PV. The regulator has a useful guide here: [EnergyCut.info/eme-solar-offers](https://www.energycut.info/eme-solar-offers)

If you're planning to install solar, check with your energy retailer to see if it will result in any negative changes to your current electricity deal. If it does, shop around for a better deal.

### Elle & Stuart, VIC

Boutique clothing shop Elle & Stuart saved significantly by focusing more on energy reduction and by changing electricity providers. After beginning her energy saving push and switching providers, owner Maureen Bourke's winter bill was just \$336 – down from the previous autumn bill of \$522.

This was a saving of \$186, or 35.6% in one quarter alone. In real terms this is an even more significant saving, as the shop would have used more electricity for heating in winter than in autumn.<sup>3</sup>

<sup>3</sup> [EnergyCut.info/retailers-case-study](https://www.energycut.info/retailers-case-study)



## Are you on the correct rates and tariffs?

It's worth checking to see that you're not being overcharged. The 'Energy Hunter' scheme identified a number of small businesses that were not on the correct tariffs and rates.

"We've found several businesses misclassified as larger electricity users resulting in a capacity charge that they should not have been paying - around \$400 per month in some instances," said Adam Clarke from Energy Hunter.



He said that one business had been charged incorrect rates and tariffs over a number of years. "One small business has been paying at least \$1,000 per month too much going back to August last year, and going back to 2010 has been overcharged a very substantial amount."<sup>4</sup>

Another business using under 40MWh of electricity per year, was being charged as a 40MWh-160MWh customer.<sup>5</sup> By being classified as a large electricity customer, they were incorrectly paying a capacity charge and significantly higher daily supply charges.

### St Therese Catholic School, VIC

When monitoring energy bills through the 'Schools Environment Tracking System' database (SETS), St Therese Primary School noticed that the school's electricity bills had jumped \$12,000 within a year, with no explanation. When Gerard McCarthy from the school contacted their energy supplier, he discovered that they were on an incorrect rate.

"Because we were recording it, we knew that something wasn't right and by investigating it we realised we were paying a lot more than we should've been," said McCarthy. "Having that data allowed us to keep tabs on what we were using and what we were being billed."<sup>6</sup>

<sup>4</sup> [EnergyCut.info/fifth-estate-article](http://EnergyCut.info/fifth-estate-article)

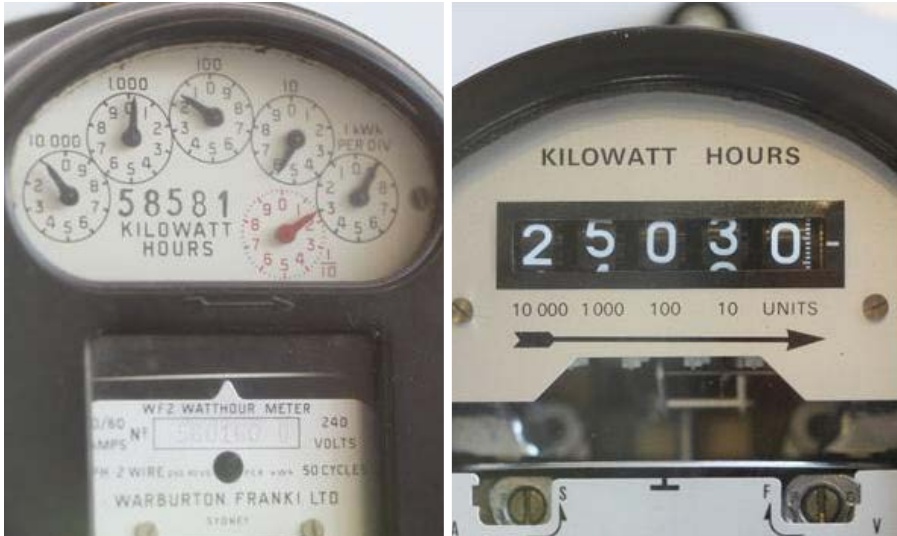
<sup>5</sup> [EnergyCut.info/aok-health](http://EnergyCut.info/aok-health)

<sup>6</sup> [EnergyCut.info/vic-primary-school](http://EnergyCut.info/vic-primary-school)

## How meters can affect your bills

Small businesses with a traditional ‘dial-display’ or ‘odometer-display’ meter get charged a flat rate for electricity. This is because these old-style mechanical meters cannot tell what time of day you’re using electricity – they only monitor accumulated electricity consumption.

This flat rate is currently the most common form of tariff, but over time this will change as more businesses have electronic meters installed on their premises.



*Dial-display meter and odometer-display meter*

Every half hour, these electronic ‘interval’ meters or ‘smart’ meters can record how much energy a business uses. This information is then sent from the meter to the energy retailer. With a smart meter, you’ll find that they can help to improve the way you monitor your ongoing energy use.



As these electronic meters can tell what time of day you're using electricity, it gives retailers the ability to offer different prices at different times of the day. This is called 'time-of-use' (ToU) pricing.

If your business is given the option to switch to a smart meter and ToU pricing, you need to firstly check that you can take advantage of cheaper off-peak power. Using an energy monitor or app, analyse your energy use throughout the day. Then check that against the ToU tariffs being charged in shoulder, peak and off-peak. After analysing how much ToU could change your bills, if it doesn't reduce them, stick with your current metre.

If ToU pricing can reduce your energy bills, ask your electricity retailer to install a smart meter.

In the coming years, more and more of these smart meters will be installed across Australia. If you're not familiar with them yet, it pays to understand how they work, as they could potentially change the size of your energy bill.



*Smart meter and interval meter*

## Can you take advantage of ‘time-of-use’ pricing?

‘Time-of-use’ pricing is the energy industry’s version of ‘early bird parking’.

If you park in the city when everybody else wants to, you pay the maximum price. But at off-peak times, car park operators want people to fill their parking spots, so they offer cheaper pricing.

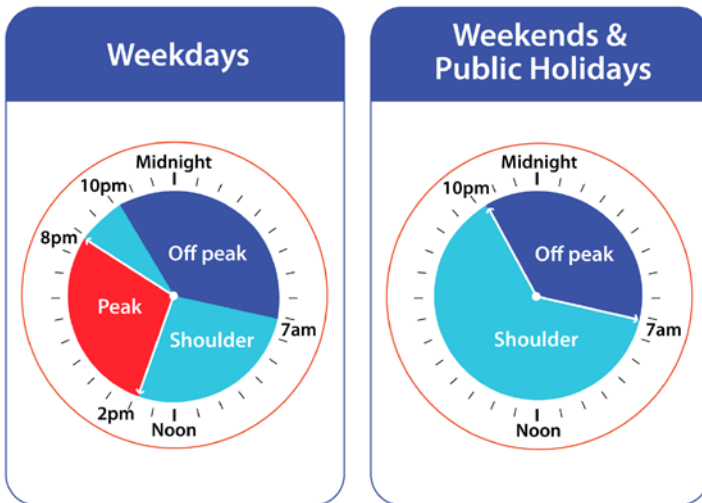
Energy companies are starting to operate in a similar way. If you use energy at a time of day when a lot of people are using it, then you’ll be charged more. If you can use energy when fewer people are using it, then you may be able to get it at a cheaper price.

For example, many bakeries typically start up their ovens any time between midnight and 3am for their first bake. This type of business would benefit from cheaper off-peak pricing.

This form of tariff is currently not available to all small businesses. That’s why it’s worth calling energy retailers to see if they can give you a time-of-use pricing plan.

### ‘Time-of-use’ pricing periods

‘Time-of-use’ energy pricing can break the day down into three periods. These times vary around Australia, but in NSW these are the times set by Ausgrid.<sup>7</sup>



<sup>7</sup> These are the time-of-use tariffs for Ausgrid in NSW. These times may be different in your local area - check with your energy retailer.



Electricity is at its most expensive during the ‘peak’ periods and at its cheapest during ‘off-peak’ periods. If your energy provider offers time-of-use pricing, you should try to shift some of your energy use to when the cost of energy is cheaper.

As an example, it is now standard operating procedure for Linfox to charge the batteries for their electric forklift trucks in off-peak times.

Ausgrid also reports that since The Royal Motor Yacht Club in Sydney adopted time-of-use pricing, they have reduced their energy bills by around \$60,000 per year.<sup>8</sup>

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*Plug-in timers can switch off air conditioners and heaters at the more expensive times of the day. If you're able to take advantage of time-of-use pricing, what other ways can your company reduce its power use during expensive peak periods?*

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If you need help, your energy retailer or EcoSmart Electrician can advise you about the best ways to take financial advantage of time-of-use pricing.

**'Off-peak' rates**

**If your company uses a hot water storage tank, are you heating the water overnight in the cheaper, off-peak period?**

**If you're not sure, call your energy retailer and take advantage of 'off-peak' rates.**

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<sup>8</sup> EnergyCut.info/ausgrid-report

## Do you pay a peak capacity charge?

If your business uses a lot of energy, you may have to pay a peak capacity charge / maximum demand charge on your bill.

The amount that you pay for your capacity charge is based on the highest level of electricity that you used in peak periods in the previous 12 months or the last month (depending on your network).

For companies that pay it, this charge should be an incentive to minimise the amount of energy that they use at peak times of the day, when energy is most in demand. At this time of day, you need to avoid excessive spikes where you turn on too much equipment all at once - this can lead to bigger capacity charges.

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*If you have a capacity charge on your bill, you should consider using the services of an energy consultant to get a better tariff.*

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## Want more information about flexible pricing?

The Victorian Government has detailed information regarding flexible pricing plans. This page gives you advice as to whether a flexible rate plan would be appropriate for your business: [EnergyCut.info/flex-pricing](https://www.energycut.info/flex-pricing)

## How power factor control can reduce your bills

If you're a large user of energy then this tip may be relevant to you.

If you pay a capacity charge and it is measured in kVA,<sup>9</sup> it may pay for you to look at improving your power factor.

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<sup>9</sup> kVA (kilo-volt Amperes) is a measure of your instantaneous demand for electricity and you are charged based on the highest demand during the billing period even if it only occurred for a short period of time. Retailers charge large energy users a demand charge as they need to design their networks to cater for the maximum demand on the system even if this rarely occurs.





### What is power factor?

In an electrical supply, a mysterious thing called ‘power factor’ comes into play. Power factor is simply a measure of how efficiently power infrastructure is being used. So, a power factor of 1 would mean 100% of the supply is being used efficiently. A power factor of 0.5 means only 50% of the supply is being used, which is very inefficient and wasteful. Typically a power factor correction unit will bring about reasonable savings in businesses that spend \$100,000 or more a year and have a power factor of less than 0.8.

Power Factor Correction has the effect of reducing the dollar amount on the kVA line item, which is one of the largest cost items on electricity bills.

### Breakers Country Club, NSW

Breakers Country Club is located in Terrigal on the NSW Central Coast. The club managers did not know if their bills were correct, how they were performing against budget, and what opportunities existed to reduce costs.

Breakers installed some power factor correction technology, which reduced the club’s energy use during peak demand periods. As we have explained in this step, peak demand charges can be one of the largest cost items in a commercial electricity bill.

By using the NRG Insight energy monitoring software, they were able to prove to their energy retailer that they had reduced their peak demand energy use. This enabled them to request a ‘demand reset’ from the energy distributor.

A ‘demand reset’ request is when the distributor is asked to review and potentially change the peak demand charge. In this instance, the request stopped Breakers from being overcharged and saved the club around \$3,500 over a 12 month period.

The detailed energy consumption data provided by the NRG Insight software also enabled Breakers to achieve a one-off \$15,000 annual saving in their electricity bill when they switched across to a new energy retailer.

Ken Pearson, the CEO of Breakers pointed to the cost saving benefits of monitoring energy use: “NRG Insight provides us with greater cost control of energy.”<sup>10</sup>

<sup>10</sup> [EnergyCut.info/breakers-country-club](http://EnergyCut.info/breakers-country-club)

**Does the peak demand charge automatically lower when you reduce energy use in peak periods?**

**No. It's a common misconception that lower energy use in peak demand periods will automatically result in reduced electricity bills.**

**Even when a company has reduced their energy use at this time of day, in some locations the same peak demand charge can appear on electricity invoices for up to 18 months afterwards.**

**This is an area where energy monitoring devices and/or the services of an energy consultant can save you money. They can help to request a 'demand reset' from the energy distributor - this is a move that can help to reduce the energy bills of large energy users.**







## STEP 6

# Switch off and save

**In small businesses and households, standby power can account for up to 10% of the electricity bill.<sup>1</sup>**

To cut this cost, the solution is simple. At the end of the day, most appliances can be turned off at the power point. Rather than reaching down behind every piece of equipment, you can turn things off with smartphone apps, remote-controlled power boards and switches. It can also be done with professionally installed isolation switches.

The first step is to create a 'switch-off list' of all appliances that can be turned off at the end of the day. This section will tell you how to automate some of these processes.

You'd be surprised at what can be turned off automatically. For example, newsagents and retailers with drinks fridges now use plug timers to turn them off overnight. To keep the drinks cold, the fridge is automatically turned back on before the shop opens. What is your equivalent to that example?

This step will show you how 'switching off' can save you money.

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<sup>1</sup> Sourced March 2015 from [Energyrating.gov.au](http://Energyrating.gov.au) - [EnergyCut.info/standby-power](http://EnergyCut.info/standby-power)



# Did you know?

## Step 6: Switch off

Research shows that many business premises are empty for 72% of the year. Despite this, lots of machines are left on standby when nobody is around.

See page 91

In small businesses and households, standby power can account for up to 10% of the electricity bill. That's why you need to switch things off at the power point.

See page 87

It is safe to completely switch off your WiFi unit as it automatically reconnects with the internet when you turn it back on. Most WiFi units take only 1–3 minutes to reconnect.

See page 92

Newsagents and retailers with drinks fridges now use plug timers to turn them off overnight. To keep the drinks cold, the fridge is automatically turned back on before the shop opens. What is your equivalent to this example?

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**UK research shows that a photocopier left on standby overnight wastes enough energy to make 30 cups of tea.**

[See page 92](#)



[See page 98](#)

**Metcash bought eight plug timers for \$9 each. They use these to automatically switch off their hot water boilers after-hours. This is saving them \$245 a year in reduced energy costs.**

[See page 93](#)

**If you have advertising signage outside your premises, use a timer to turn it off. Between 11pm–6am very few people will be around to see it.**

[See page 95](#)

**'Smart' power boards help to eliminate standby power use. They detect when your 'master' device (eg a computer) has been turned off and then shut down power to connected 'slave' devices (eg a printer and WiFi unit).**

[See page 97](#)

**Hard-to-reach plug boards and equipment can now be turned off with remote-controlled plugs as well as WiFi-enabled plugs that are linked to smartphone apps.**

[See page 96](#)



# In this step

## No-cost/low-cost tips

- ▶ How many hours of power do we waste?
- ▶ Save money by turning off your WiFi
- ▶ How inexpensive plug timers can save you money
- ▶ Create a simple switch-off list
- ▶ Identify your after-hours energy use
- ▶ Solutions for when you can't reach the plug
- ▶ Save money with a 'smart' energy saving power board
- ▶ Remotely controlling your appliances with WiFi-enabled plugs and smartphone apps
- ▶ No-cost ways to automate the switch-off process
- ▶ Do regular spot checks
- ▶ Place 'switch-off' posters and stickers around your workplace
- ▶ Keep a list of things that need to be left on





## How many hours of power do we waste?

Research shows that many business premises are empty for 72% of the year.<sup>2</sup> There are 168 hours in a week, but most premises are only used for 50–60 hours.

Despite this, lots of machines and appliances are left on standby when nobody is around. When you leave something on 24 hours a day, it can add up to 6,000 hours a year of wasted power.

This represents a very easy opportunity to cut energy costs.

Ensuring that all appropriate equipment is completely turned off after-hours is an easy way to reduce your energy bills and boost your bottom line.



**Take this tip home:** When it comes to standby power, think of what you leave on at home: microwaves, TV set, the DVD player, set-top box, WiFi and more. You can easily switch off and save money there too.

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*Research shows that many business premises are empty for 72% of the year. Despite this, lots of machines are left on standby when nobody is around.*

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<sup>2</sup> Source: EnergyCut.info/FM-magazine

## Save money by turning off your WiFi

Most businesses only use their WiFi eight hours a day, but they leave it on 24 hours a day, 365 days a year.

Leaving your WiFi unit on all the time means that it's using 8,760 hours of power every year. It's a waste of money.

It is safe to completely switch off your WiFi unit as it automatically reconnects with the internet when you turn it back on. Most WiFi units take only 1-3 minutes to reconnect.

You can turn it off manually or you can add it to your computer plug board and have it turned off automatically by a timer or smart phone app.



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***UK research shows that a photocopier left on standby overnight wastes enough energy to make 30 cups of tea.<sup>3</sup>***

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### **What do you leave on?**

**When their premises are closed, many companies unnecessarily leave on their air conditioners, exhaust fans, photocopiers, water-coolers, motors, audio-visual equipment, air compressors, computers and fax machines.**

### **What do you leave on?**

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<sup>3</sup> [EnergyCut.info/tea-photocopier](http://EnergyCut.info/tea-photocopier)



## How inexpensive plug timers can save you money

Water urns and boilers use a lot of energy. However, they're commonly left on at weekends when nobody is around. Switching them off after-hours is an easy way to reduce your power bills.

Metcash bought eight electrical plug timers for their distribution centre in Laverton and plugged their hot water boilers into them. They programmed the plug timers to:

- switch the water boilers off at the end of the working day
- turn them on just before people arrived at work
- switch all the water boilers off on weekends.

Each plug timer cost \$9. After buying eight for \$72, they are now saving \$245 a year in reduced energy costs.

Water-coolers, espresso machines, drinks fridges and vending machines are other pieces of equipment that can be turned off and on by a plug timer.

Where could you use a plug timer in your business?



### Lizards Early Learning Centre, QLD

Lizards Early Learning has saved 35% on their energy bills. They used to operate their air-conditioning from 6am–6pm, but they now turn it on at 8.30am and switch it off when they go outside at 3pm. This has reduced usage by 5–6 hours a day.

“Air-conditioning use has been almost halved in summer and there is absolutely no difference to the comfort levels for the children,” said Centre Manager Kristen Fox. To further save energy, they turn off any fans, lights and electrical appliances, like CD players, when they're not in use.<sup>4</sup>

<sup>4</sup> [EnergyCut.info/childcare-centres-case-study](http://EnergyCut.info/childcare-centres-case-study)

## Create a simple switch-off list

### Step 1: Create the switch-off/switch-on list

When it comes to minimising energy waste, the first step is to identify what can be turned off when your business is closed.

- When your business has finished for the day, visit every room and make a note of all the equipment that uses energy.
- Make a list of all the equipment that does not need to be running after-hours.
- This process can identify redundant equipment that is no longer needed. Unplug this equipment and remove it.
- Remember to update the list every time you buy new equipment.



### Bakers Delight Lane Cove, NSW

Baker's Delight Lane Cove saved \$1,000 a quarter by implementing a start-up and shut-down procedure.

Previously the bakers had switched the ovens on when they arrived at 2am even though they would not usually start baking until after 3am. As the ovens only require 30 minutes to be hot enough, this was wasting energy every morning, according to owner Joyce Aimond.<sup>5</sup>

### Step 2: Develop a switch-off protocol

Some equipment can be turned off before you close. Air-conditioning or heating, for example, can be turned off half an hour before closing time.

- When it comes to turning off equipment, do it in an order that maximises your energy savings. When you've identified the most efficient shut-down process, write it down and ensure that your staff implement it.
- If cleaners come in to your building after-hours, make it a 'term of trade' that they turn off all the lights and other equipment when they've finished.

<sup>5</sup> [EnergyCut.info/dosomething-research](http://EnergyCut.info/dosomething-research) & [EnergyCut.info/bakers-delight](http://EnergyCut.info/bakers-delight)



- Wherever possible, automate the things that can be turned off. If you have advertising signage outside your premises, use a timer to turn it off. Between 11pm–6am very few people will be around to see it. Internal and external lights can also be turned off using motion detectors and photosensors.
- An EcoSmart Electrician can advise on ways to automate the switching off of your equipment.

### Step 3: Develop a switch-on protocol

At the start of the day when equipment is being turned on, do it in an order that maximises your energy savings.

With equipment that needs to be turned on before your premises open, minimise the time that this equipment is operational before people arrive for work. Don't turn it on until you really need it.

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***If you have advertising signage outside your premises, use a timer to turn it off. Between 11pm–6am very few people will be around to see it.***

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#### Kinky Curly Straight Hair Salon, SA

“Our ‘end-of-day checklist’ instructs staff to switch off all power points, lights and equipment that is not required overnight,” said Kinky Curly Straight salon co-owner Mojca Bizjak-Mikic. “Our policy on energy efficiency also states that we turn off power points and lights during the day if they are not required.”<sup>6</sup>

<sup>6</sup> EnergyCut.info/dosomething-research

## Identify your after-hours energy use

When you've turned everything off, use an energy display to show how much energy is being used by the equipment that you have left on. Write this figure down and put it in a prominent place.

At the end of the day, if your energy display shows a higher reading than this, then:

- equipment has been left on that needs switching off, or
- equipment may be malfunctioning and is using higher than normal amounts of energy.

## Solutions for when you can't reach the plug

### Remote control plugs

Hard-to-reach plug boards and equipment can now be turned off with remote controlled plugs.

On leaving the workplace, hit the off button on the remote and it can turn off four power boards at once. Sticking the remote next to the exit door of your building makes this switch-off process nice and easy.



A range of remote control plugs have been released under various brand names (Efergy, Kambrook and ALDI's Bauhn brand are the best known).

Some of these packages offer four remote control plugs. Prices range from \$25-\$50. Belkin also sell the 'Conserve Switch AV Surge Protector' plugboard. Priced at \$130, this has six plug outlets that can be turned off with a remote control.

An EcoSmart Electrician can also give you professional advice about whether it makes financial sense to install a central electrical switch to turn off all your devices and appliances.

### The EcoSwitch

If a plug socket or power board is hard to reach, you can also buy an EcoSwitch plug.

The EcoSwitch is basically a long extension cord for plugboards and appliances. It has an on-off switch that you position in an





easy-to-reach place. This switch has a big green light on it, so it's hard to miss when your appliance or power board has been left on.

They're only \$20 each and pay for themselves in a short time. They're available from most hardware stores or via [EcoSwitch.com.au](http://EcoSwitch.com.au).

## The Efergy Foot Switch Power Board

If you need to have a power board in a hard-to-reach place, you may want to buy an Efergy Foot Switch Power Board. To turn it off, all you have to do is step on the foot switch. Prices range from \$40-\$50.



## Save money with a 'smart' energy saving power board

There are now a variety of 'smart' power boards on the market that help to eliminate standby power use. Primarily developed for home or small office use, they detect when your 'master' device has been turned off and then shut down power to connected 'slave' devices.

For example, if you turn off a computer, they will automatically cut power to connected 'slave' devices such as the monitor, printer and WiFi unit.

If you have devices like phones or answering machines that need to be on all the time, 'smart' power boards are available that let some devices remain fully on, but turn others off.



Visit your local hardware store or get professional advice from an EcoSmart Electrician as to what 'smart' power boards will work best for your business.

## The Ship Inn Hotel, QLD

Staff training was one of the key changes that helped the Ship Inn Hotel to reduce their energy bills by 21%. Staff were trained to turn off lights and appliances that didn't need to be in use. Their cleaner was also trained to turn off the lights when he had finished cleaning.<sup>7</sup>

<sup>7</sup> [EnergyCut.info/the-ship-inn](http://EnergyCut.info/the-ship-inn)

# Remotely controlling your appliances with WiFi-enabled plugs and smartphone apps

You can remotely control appliances in your business using smartphone apps that communicate with WiFi-enabled plugs.

## How do they work?

You plug your appliance or power board into the WiFi-enabled plug and put it into the wall socket. Using your WiFi network, you then pair the app with the WiFi-enabled plug. You give the appliance a name, choose a graphic for it and you can then remotely turn the appliance on and off using your phone or tablet.

You can be in your office or on the other side of the world. As long as you have an internet, 3G or 4G connection, you'll have remote control of your appliance energy use.

In addition to manually switching appliances on and off with these apps, you can also set schedules where you program your plugs to turn things on at any time of the day or night.



## What systems are available?

There are two high quality 'app and plug' systems on the market:

**Belkin's 'WeMo Switch':** [www.belkin.com/au](http://www.belkin.com/au)

**Efergy's 'Ego':** [www.efergy.com/au](http://www.efergy.com/au)

These apps are free and the WiFi-enabled plugs cost from \$60-\$70 for the Efergy Ego and \$60 for the WeMo Switch.







## No-cost ways to automate the switch-off process

In business hours, you can set computers to go into sleep mode when they're left idle for 10 minutes or more. A sleeping computer will save you money as it uses as little as 5% of full power. But do remember to totally switch them off at the end of the workday. In 'Step 11 - Cut your IT energy costs', we list the software that can automate this procedure.

You should also check the energy saving settings on all your other equipment, such as multi-function devices and photocopiers.

Many of these devices can be programmed to turn themselves off at the end of the workday and over weekends. If your existing equipment cannot do this, look out for this functionality when you come to replace it.

### The Good Loaf, VIC

The Good Loaf saved between eight and nine hours of energy per day, simply by fitting a timer on the baking oven so that it only operates when required. Previously it had been switched on the day before, so it was ready for use early in the morning. Now it switches on automatically between 3am and 4am.<sup>8</sup>

## Do regular spot checks

At regular intervals throughout the year, do spot checks for equipment that has been inadvertently left on after-hours.

If equipment has been left on, send a friendly note to staff asking for their assistance in turning off equipment at the end of the working day.

If the problem continues, you can raise the matter in a staff meeting or performance review.

<sup>8</sup> [EnergyCut.info/the-good-loaf](http://EnergyCut.info/the-good-loaf)

## Place 'switch-off' posters and stickers around your workplace

Place energy saving posters and stickers around your workplace to act as a constant reminder to your staff to switch off and save money.

Reminders can be printed onto adhesive stickers and then placed next to light switches, hot water urns, monitors and other electrical devices.



## Keep a list of things that need to be left on

You may want to use stickers to mark equipment and appliances that need to be left on.

These include security systems, security lights, fridges and freezers, fire safety systems and exit lighting.

Make a list of essential equipment that needs to be left on and email this to your staff. You may also want to discuss it in a staff meeting.

9 Poster courtesy of News Corp: [1degree.com.au](http://1degree.com.au)



TEMPERATURE

UP

DOWN

HEAT  
OFF



## STEP 7

# Watch your thermostat

Watching your thermostat levels is so important that it gets its own step.

How many times have you walked into a building and found it to be too hot or too cold? When this happens, it's because the thermostat is set incorrectly. When it comes to wasting energy, it's one of the most common mistakes that businesses make.

Having the correct settings on your thermostat can save you a lot of money. Every single degree you raise or lower your thermostat can increase your heating or cooling bills by up to 10%. Many organisations set their thermostats many degrees higher or lower than they should be and they get big bills as a result.

### What are the correct settings?

**Many workplaces set systems to a constant 20–24°C regardless of the weather and what people are wearing. However, your thermostat should be adjusted according to the season.**

**In summer your thermostat should be set between 24–27°C. If you set it at 27°C, this means your cooling will kick in only when the temperature goes above 27°C.**

**In winter your thermostat should be set between 18–20°C. If you set it at 18°C, your heating will switch on when the temperature goes down below 18°C.**



# Did you know?

## Step 7: Thermostat

In winter  
your thermostat  
should be set  
between 18-20°C.

See page 103

In summer  
your thermostat  
should be set  
between 24-27°C.

See page 103

Your thermostat  
might not read the room  
temperature correctly  
if it is in direct sunlight  
or near heat radiating  
equipment such as  
refrigerators.

See page 110

Every degree  
you raise or lower  
your thermostat  
can increase your  
heating or cooling  
bills by up to 10%.

See page 107



See page 109

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One of the no-cost ways that Lizard Early Learning Centre has saved 35% on energy bills is to ensure that the thermostat is always set at the correct level.

See page 111



See page 111

You can install a lock cover over your thermostat to stop people from changing the temperature. They are available from hardware stores for about \$20.

See page 109

If you have free standing heaters that don't have inbuilt thermostats, you can buy a plug in thermostat for about \$40 – it can save you up to \$120 per room over the winter season.

See page 111

Programmable thermostats can be programmed to different temperatures and can turn your heating or cooling on or off according to whether the building is occupied or not.

See page 108



See page 108



# In this step

## No-cost/low-cost tips

- ▶ The benefits of correct thermostat settings
- ▶ How to stop people changing the thermostat
- ▶ Make sure your thermostat is in the right place
- ▶ What to do if your heater or air-conditioning unit doesn't have a thermostat





## The benefits of correct thermostat settings

This is worth repeating. If you turn up your thermostat by just one degree in winter, and down by one degree in summer, your heating and cooling bills can increase by up to 10%.

In summer when temperatures are warm outside, coming into a building set at 24–27°C will feel cool.

In winter, when temperatures are low, 18–20°C inside will feel comfortably warm but not hot. You don't need it to be warmer than this – on their way to work, people will already be wearing winter clothing.

If the thermostats at your workplace are out by just a few degrees, you will needlessly be paying more for your heating and cooling.

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*Every degree you raise or lower your thermostat can increase your heating or cooling bills by up to 10%.*

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## Why you should install programmable thermostats

Programmable thermostats can be programmed to different temperatures and can turn your heating or cooling on or off according to whether the building is occupied or not.



You can also set them to turn your system on before people arrive at work and off just before they leave.

Programmable thermostats can have multiple temperature settings for different times of the day. If there is an unexpected change in the weather, these programmable settings can be manually changed without affecting the ongoing settings that you've programmed.



## How to stop people changing the thermostat

There's a well-known story of a company owner who got his electrician to install a fake thermostat. When his staff adjusted it, there were two benefits:

- They felt better even though they weren't actually affecting the heating and cooling settings.
- He got the benefit of lower HVAC costs.



If your staff keep changing your thermostat settings, you could also install a lock cover over it. This will stop them from changing the settings. You can buy them online or from select hardware stores for \$20.

### Other actions to take

Before you get to the point of installing a lock cover, try and find out why your staff want a different setting:

- You can state in your 'energy reduction plan' that the thermostat settings cannot be changed unless approval is given by the person who is in charge of energy reduction.
- It may be that there are draughts - fixing this will be far cheaper than having the wrong thermostat settings.
- Your thermostat may be located where it doesn't work properly. An EcoSmart Electrician can check this for you.
- It may be that staff are dressing inappropriately for the season. If it's winter, they should be wearing winter-appropriate clothing.
- Engaging with your staff will help you to arrive at a setting that maximises their comfort and productivity, and minimises your energy bills.

#### Could you use a fake thermostat?

**One company controls the thermostat on the air-conditioning centrally so that cooling and heating aren't excessive. Staff think they have full control of the thermostat which has a false dial from 18°C to 30°C, but it can actually only be set between 22°C and 24°C with a dial located elsewhere.<sup>1</sup>**

<sup>1</sup> [EnergyCut.info/dosomething-research](http://EnergyCut.info/dosomething-research)

## Whitford Property Real Estate, VIC

Whitford Real Estate Director Michael Ferris keeps winter air-conditioning costs down with a staff policy of maintaining the thermostat at an optimal temperature.

“People have the air-con on and think, ‘I’ll just crank it up and put my board-shorts on!’ But why not set it at 19°C and put a jumper on?” he said.<sup>2</sup>

## Make sure your thermostat is in the right place

Your thermostat may not read the room temperature accurately if it’s:

- near heat radiating equipment such as refrigerators
- in direct sunlight (from a window)
- in a draughty area (near a doorway)
- in an area with low air movement (behind an open door)
- on an external wall.

You can check the accuracy of your thermostat reading by using a thermometer. If the thermostat reading is incorrect, talk to your EcoSmart Electrician.

## Indulge Fine Belgian Chocolates, VIC

Based in Bendigo, Indulge Fine Belgian Chocolates manufactures and sells its own handmade confectionery and cakes.

They maintain the air-conditioning thermostat at 25°C or more in summer while in winter, excess heat from the chocolate equipment keeps the cafe warm.

In addition, staff keep doors shut and wear warm clothes so that the heating can remain switched off.

In the last four years, Indulge Fine Belgian Chocolates has grown by 20%, but its energy consumption has remained the same. This is equivalent to savings of around \$1,600 a year.<sup>3</sup>

<sup>2</sup> Information courtesy of IBSA: [EnergyCut.info/whitford-property](http://EnergyCut.info/whitford-property)

<sup>3</sup> Sourced from the Whyalla Vet Clinic website: [EnergyCut.info/indulge-choc](http://EnergyCut.info/indulge-choc)



## What to do if your heater or air-conditioning unit doesn't have a thermostat

If you have a radiant, fan, electric or column-style heater, it may not have a room temperature thermostat. Without an inbuilt thermostat, these types of heaters can overheat the room, costing you money in the process.

The solution is to buy a plug-in electronic thermostat called the HeaterMate. Costing only \$40 per unit, you plug a heater (or air conditioner) into the thermostat and then plug the thermostat into the wall socket.

When the room reaches the temperature on the plug-in thermostat, the unit automatically turns off the heater or air-conditioner.

The Australian inventor of this device claims it can save up to \$120 per room over the winter season. As such, they can pay for themselves in a short space of time.

They can be bought from [HeaterMate.com.au](http://HeaterMate.com.au).<sup>4</sup>



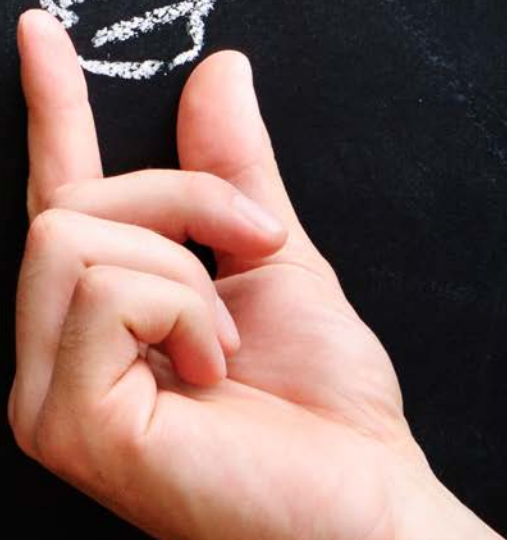
### Lizards Early Learning Centre, QLD

One of the no-cost ways that Lizard Early Learning Centre has saved 35% on energy bills is to ensure that the thermostat is set at the correct level. They removed all the remote controls as the children were playing with them and changing the thermostat settings.

“The children help out with our energy saving and they are rewarded with stickers,” said Manager Kristen Fox.<sup>5</sup>

<sup>4</sup> To watch a video of this device in action, visit [EnergyCut.info/heatermate](http://EnergyCut.info/heatermate)

<sup>5</sup> [EnergyCut.info/childcare-centres-case-study](http://EnergyCut.info/childcare-centres-case-study)





## STEP 8

# Cut your lighting bills

**Lighting accounts for up to 10–25% of the electricity bills for many businesses.<sup>1</sup> For some companies it can be as high as 50%.<sup>2</sup> That is why this step is so important.**

Fortunately, reducing your lighting bills is easy. By implementing the tips in this step, businesses can reduce their lighting energy use and running costs by up to 82%.<sup>3</sup>

Saving dollars can be as simple as:

- turning off lights
- maximising the use of daylight
- switching to more energy efficient lighting
- removing lights from overlit areas
- zoning your lighting
- getting the most out of your existing lighting.

This step will also show you that when you invest in energy efficient lighting, the payback can often be surprisingly quick. This means you start saving sooner.

<sup>1</sup> [EnergyCut.info/sustainability-victoria-factsheet](https://EnergyCut.info/sustainability-victoria-factsheet)

<sup>2</sup> [EnergyCut.info/oeh-lighting-costs](https://EnergyCut.info/oeh-lighting-costs)

<sup>3</sup> [EnergyCut.info/oeh-lighting-tech-report](https://EnergyCut.info/oeh-lighting-tech-report)





# Did you know?

## Step 8: Lighting

By implementing the tips in this step, businesses can reduce their lighting energy use and running costs by up to 82%.

See page 113

When you maximise the use of daylight you reduce the use of artificial light. It's a very simple way to cut your lighting bills.

See page 125

Fluorescent lighting emits UV rays and infrared radiation that can cause deterioration in food. Over time it can also cause fading in magazine covers, books and advertising displays. Energy efficient LED lighting does not have this problem.

See page 120

**Converting conventional lighting to LED alternatives will often have less than a two year payback, making investment a very simple decision.**

See page 121



See page 155



**Motion detectors and sensors that turn lights on and off, do cost money to install, however the ongoing energy savings are guaranteed.**

**See page 131**



**See page 152**

**Halogen downlights can get as hot as 370°C which makes them a fire risk. LED alternatives generate substantially less heat, so they're safer and can reduce air-conditioning costs.**

**See page 140**

**A LED downlight can last for up to 50,000 hours – this is up to 25 times longer than a halogen downlight and significantly reduces the amount of times a tradesperson has to go up a ladder to replace your lighting. They also reduce energy use by up to 83%.**

**See page 118**

**If an area is too brightly lit, find a light fitting with two fluorescent tubes and take one out. This is called delamping. If the lighting level is adequate afterwards, you've instantly halved the running cost of that light fitting.**

**See page 124**

**Maintain and clean your lighting. According to Ausgrid, dust diminishes lighting effectiveness and can reduce lighting output by half.**

**See page 123**



# In this step

## **Saving money on lighting**

- ▶ **The benefits of energy efficient lighting**
- ▶ **Take advantage of LED lighting developments**

## **No-cost quick results**

- ▶ **Save money by switching off lights**
- ▶ **How cleaning can cut your lighting bills**
- ▶ **Is it too bright? How delamping reduces your lighting bills**

## **Saving money with daylight**

- ▶ **Use photosensors and dimmers to adjust lighting levels**
- ▶ **Use skylights, transparent roof panels and light tubes to cut lighting bills**

## **Low-cost money-saving adjustments**

- ▶ **Zone your lighting**
- ▶ **Save money with motion detectors and timers**
- ▶ **Use reflectors to boost your usable light output**
- ▶ **Reduce your energy costs with task lighting**
- ▶ **Improve the energy efficiency of your signage**

## **Lighting alternatives that save you money**

- ▶ **Alternatives for standard incandescent globes**
- ▶ **Alternatives for T8 twin fluorescent tube lighting**
- ▶ **Alternatives for halogen downlights**
- ▶ **Alternatives for high-bay and low-bay lighting**
- ▶ **Alternatives for outside lighting**
- ▶ **Alternatives for exit and emergency lighting**

## **Making informed decisions**

- ▶ **How to buy good-quality LED lighting**
- ▶ **What questions should you ask a lighting expert?**

## **Audit your workplace lighting**

- ▶ **How to conduct a room-by-room audit of your existing lighting set-up**

# Saving money on lighting

## The benefits of energy efficient lighting

If you switch to energy efficient lighting, you'll save money. Here's how:

- **Energy efficient lighting is cheaper to run**

Switching to a LED light bulb that uses 83% less energy will cut the electricity bills from that light fitting by up to 83%.<sup>4</sup>

- **You don't have to buy light bulbs as often**

A LED downlight can also last for up to 50,000 hours – this is 25 times longer than a halogen downlight which lasts for only 2,000 hours. This means that buying a single high-quality LED downlight can do away with the need to buy up to 24 halogen downlights. Halogen downlights can cost \$5 each, so that's up to \$120 saved on purchase costs.

- **You use less electricity**

Energy efficient lighting uses lower wattage to give out the same amount of light. This reduces the amount of electricity that's needed.

- **Maintenance is cheaper**

When an energy efficient light lasts up to 50,000 hours, you significantly reduce the amount of times a maintenance person has to go up a ladder to replace your lighting. This saving is rarely taken into account when companies assess the financial case for switching to energy efficient lighting.

Check how much you pay someone to install new lighting. From this, you can work out your savings on maintenance replacement costs over the next 5-10 years. The savings can be considerable.

- **It makes running your air conditioner cheaper**

Energy efficient lighting can generate less heat, so they can reduce air-conditioning costs.

- **You might be able to get financial assistance to switch to energy efficient lighting**

Grants and assistance packages are sometimes available for companies who make the switch to energy efficient lighting. It's worth finding out whether your business is eligible.

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<sup>4</sup> EnergyCut.info/oeh-lighting-tech-report



## The Marriott Hotel, NSW

The Sydney Harbour Marriott Hotel is a 5-star hotel complete with a total of 563 rooms, including 45 suites and 21 meeting rooms. Although it's not a small business, their lighting changes show the money-saving potential of energy efficient lights.

Energy efficiency specialists, Easy Being Green replaced 9,975 conventional lights with energy efficient LEDs, saving the Marriott approximately \$250,000 per year in energy costs. Over the 10-year lifespan of the new LED lighting system, the hotel will save \$2.5 million at today's energy prices.

Sydney Harbour Marriott Hotel's Director of Engineering, Cyrus Tolentino, said, "Thanks to the long-life LED lighting that was installed, we also reduced our labour and material costs as we now need to change blown bulbs less frequently. We estimate that this saves us an additional \$130,000 per year over and above the energy savings."

The reduction in energy use from their new lighting set-up generated 'Energy Saving Certificates' under the NSW 'Energy Savings Scheme'. These certificates are worth money which Easy Being Green applied as an upfront discount reducing the Marriott Hotel's capital expenditure.

To check if a lighting upgrade would benefit your business, visit

[EasyBeingGreen.com.au](http://EasyBeingGreen.com.au).<sup>5</sup>



<sup>5</sup> [EnergyCut.info/marriott-hotel](http://EnergyCut.info/marriott-hotel)

## Take advantage of LED lighting developments

This step shows you a range of different lighting technologies that can all reduce your energy bills. One lighting technology that has been developing at a rapid rate in recent years is LED lighting.



*LED downlight*

Originally seen as a cost-saving alternative to halogen downlights, LED lights are now coming out in all shapes and sizes and can replace a range of different lighting types.

They last up to 50 times longer than the old incandescent globe and use up to 80% less electricity.<sup>6</sup> It's no wonder so many businesses are now installing them. They can save you a lot of money.

There are additional benefits to LED lighting that make them better than fluorescent alternatives:

- They reach immediate full brightness.
- They contain no mercury or lead.
- They generate very little heat, which reduces air-conditioning costs. It means they also work well in fridge and freezer cases.
- They emit no infrared radiation or UV rays. Unlike fluorescent lighting, led lighting doesn't cause deterioration in foods and won't fade books, magazines or advertising displays.
- They enhance the look of products in a retail setting, and provide uniform brightness and illumination.
- LED tubes are also very robust - unlike the conventional fluorescent tubes, they can be dropped without breaking.

Previously, LED lighting was not able to cope with high temperatures in rooftop areas. However, new LED products are now being released that have overcome this problem. As this chapter will show, LED lighting is now available for a wide variety of lighting applications.

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<sup>6</sup> [energycut.info/energy-gov-bulbs](http://energycut.info/energy-gov-bulbs)

**Busting lighting myths:****'Energy savers aren't as good as the old lights'**

When energy-saving lights first came out, they weren't as bright as the old globes and took longer to 'warm up'. As such, they got a reputation for being 'too cold' and not bright enough.

Today all that has changed. New-generation energy-saving lights are available in warm tones and every brightness level.

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*“Converting conventional lighting to LED lighting will most often have a less than two year payback, making investment a very simple decision.”*

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<sup>7</sup> Andrew Randall, Easy Being Green

## No-cost quick results

### Save money by switching off lights

Unnecessary lighting impacts your bottom line. Turning it off is the simplest way to save money.

#### Encourage people to switch off the lights

This can be encouraged by placing 'switch-off' stickers near light switches and building exits. See 'Step 6 - Switch off and save' for more detail.

If you have a lot of switches in one location, you might wish to label them so staff and contractors know what they're switching off.

If you only have one switch that turns on all the lights in an area, an EcoSmart Electrician may be able to re-zone the lighting and add more switches - that way you'll only need to turn on the lights that you need.

#### Turn off displays

Display cases and signs can be switched off at night and over weekends. If you have an illuminated advertising sign outside your business, you can use a timer to make it turn off between midnight and 6am (or you may be able to dim it, thereby reducing the amount of energy that it uses).

**If you have a stationery cupboard, have your electrician install a contact switch that turns on the light when you open the door and turns it off when you close it.**







## How cleaning can cut your lighting bills

Late at night, people often look at commercial buildings and wonder why they've left the lights on. In many cases, it's because the company has not instructed their cleaners to turn them off.

If you have a cleaner who comes into your building after-hours:

- make it part of their contract that they turn off the lights when they're finished
- make sure that they know where the switches are and how they can override any timed lights.



## Why your lighting should be kept clean

You or your cleaners should also keep your lighting fixtures clean and free of dust. According to Ausgrid, dust diminishes lighting effectiveness and can reduce output by half.<sup>8</sup>

Some LED lights have reflectors and last for 50,000 hours. It is a good idea to establish a regular maintenance program to clean these lights to ensure that you gain maximum benefit from your investment.

You should also set up a lighting maintenance program with your EcoSmart Electrician. That will maximise the energy and operational efficiency of your lighting set-up.

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***Maintenance can help to maximise the energy and operational efficiency of your lighting set-up.***

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<sup>8</sup> [EnergyCut.info/ausgrid-lighting-report](http://EnergyCut.info/ausgrid-lighting-report)

## Is it too bright? How delamping reduces your lighting bills

There may be some areas of your business where the lighting levels are too bright. You can lower the levels by removing some of the lights. This is called 'delamping'.

- Delamping saves money on powering your lights.
- It cuts the cost of replacing lights.
- Less lights mean less heat, so delamping also saves money on air-conditioning costs.
- Excessive lighting can affect concentration, cause eye strain, and affect productivity.

### The process of delamping is easy

- If an area is too brightly lit, find a light fitting that contains two fluorescent tubes and take one out. If the lighting level is still adequate afterwards, you've instantly halved the running cost of that light fitting. For more information on lighting levels, check out 'What are the recommended minimum light levels for your business?' later in this chapter.
- After you have removed the second tube, if the lighting level is not quite bright enough, you can get your electrician to add a reflector above the single tube. This can boost the brightness of that delamped light fitting by up to 30-40%.<sup>9</sup>
- When you delamp, make sure that you clean the remaining light and fitting.

### What are the best areas for delamping?

The areas near windows are a good place to start as they have lots more natural light. Other places are kitchens, bathrooms, storerooms, coolrooms, stairwells, corridors and meeting rooms.

When you've removed a light, put stickers or labels next to the fitting so people know the light has been deliberately delamped.

Save the bulbs or lighting tubes you've removed for later use. This will save you the cost of buying replacements when the other lights reach the end of their life.

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<sup>9</sup> [EnergyCut.info/rti-reflector](http://EnergyCut.info/rti-reflector)



## Saving money with daylight

Daylight is free, so take advantage of it.

- Keep your windows clean and clear of shading. If necessary, trim back vegetation that blocks the outside light.
- Plant deciduous trees outside your windows. They'll shade you from the hot summer sun, but when they lose their leaves, they'll let in light and warmth in winter.
- If you have window blinds to shut out glare, can they be opened at a time of day when this isn't a problem? If you do get glare, window film can help to minimise the problem.
- You should position your workspaces so that they make the most of available light sources. You should also look to relocate cupboards, screens and bookcases that block natural light.
- If your premises are not exposed to much natural daylight, install skylights, solar tubes or translucent roof sheeting to bring light in through the roof.
- Use light colours on walls, ceilings and benchtops as they can reflect and maximise the effectiveness of natural light.

When your business maximises the use of daylight, it reduces the use of artificial light. It's a very simple way to reduce your lighting bills.

### Heather Brae Shortbreads, VIC

At Heather Brae Shortbreads, they harnessed free light from the sun by installing skylights. This flooded the warehouse and offices with natural light and significantly reduced the need for artificial light.

In addition, they will replace all existing lights with LEDs at a cost of \$25,000. According to owner Bassam Wakim, the projected savings of \$10,000 a year will give them a payback period of only 2.5 years.<sup>10</sup>

<sup>10</sup> [EnergyCut.info/heather-brae-shortbreads](https://www.energycut.info/heather-brae-shortbreads)

# Use photosensors and dimmers to adjust lighting levels

## Photosensors

If a part of your business premises gets a lot of daylight, it may make financial sense to install photosensors.

Photosensors detect the amount of natural light in a room. When daylight is strong, they automatically decrease your artificial lighting levels. This can save you up to 15% on your lighting costs.<sup>11</sup>

You just need to ensure that the lighting you're using is capable of being gradually dimmed. For more advice, talk to an EcoSmart Electrician or a local electrician with experience in this area.

## Dimmers

If you're upgrading your lighting, you may want to install fixtures that use a dimmer. This will allow you to manually adjust your lighting levels. The lower the light level, the lower your lighting bill will be.

If you can't afford photosensors, give your employees the ability to manually dim the lighting where they work. When they're given this ability, one study found that up to 84% of people dim their lighting levels.<sup>12</sup>

### Tyres4U, Keysborough VIC

Tyres4U moved into a new facility that was more energy efficient than their old premises.

Translucent roof sheeting, motion sensors and T5 fluorescent lighting with dimmable ballasts has significantly reduced their energy bills. Even though their new facility is two and a half times bigger, their power bill has been reduced by 40%.

In addition to a smaller electricity bill, there have been other improvements. "The extra bonus for us is that our stocktake has become much more efficient," explained Jeremy Lane, Branch Manager for Tyres4U.<sup>13</sup>

<sup>11</sup> [EnergyCut.info/cc-photo-sensors](http://EnergyCut.info/cc-photo-sensors)

<sup>12</sup> [EnergyCut.info/motion-analysis](http://EnergyCut.info/motion-analysis)

<sup>13</sup> [EnergyCut.info/tyres4u-case-study](http://EnergyCut.info/tyres4u-case-study)



## Use skylights, transparent roof panels and light tubes to cut lighting bills



### *Skylights letting in natural light*

Installing skylights, transparent roof panels and light tubes can significantly cut the use of artificial lighting - particularly where the work environment is not able to take advantage of natural light.

According to the Victorian Employers' Chamber of Commerce and Industry (VECCI),<sup>14</sup> a skylight can admit more than three times as much light as a vertical window of the same size.<sup>15</sup> Depending on the type of building that you're in, this form of 'daylighting' offers significant potential to reduce lighting energy costs.

<sup>14</sup> [EnergyCut.info/vecci-home](http://EnergyCut.info/vecci-home)

<sup>15</sup> [EnergyCut.info/cc-skylights](http://EnergyCut.info/cc-skylights)

If your business has a warehouse, garage or workshop, transparent roof panels and skylights can significantly reduce the use of artificial light.

In addition to saving you money on electricity, natural daylight can often provide you with better quality light.

With professional advice and good design, a skylight system can also generate less heat than the electric lighting that it replaces. This can help to reduce air-conditioning costs.

- If you'd like to know more about the money-saving potential of skylights, the Skylight Industry Association has a useful guide here; [EnergyCut.info/skylight-info](https://www.energycut.info/skylight-info)
- To get professional advice on installing skylights and light tubes, you can find a member of the Skylight Industry Association here: [EnergyCut.info/skylight-installers](https://www.energycut.info/skylight-installers)

### What to look for when buying a skylight

When assessing different skylights, ask how much heat they let out and how much heat they block from coming in.

- The amount of heat the skylight lets out is measured as a 'U-value'. The lower the U-value, the better it is from a heat retention point of view.
- The amount of heat that the skylight blocks from coming in is measured as an 'SHGC value'. The lower the SHGC value, the better it is at blocking sun-generated heat from entering your premises.

When making a decision about skylights, try and buy the product with the lowest U-value and the lowest SHGC value.

## Whyalla Veterinary Clinic, SA

"Most of the time we work the sun is shining," said Dr. Andrew Melville-Smith of Whyalla Veterinary Clinic, referring to his clinic's innovative system of skylights. "Now instead of using electricity to light the interior of the clinic, the sunlight streams in through the skylights."<sup>16</sup>

<sup>16</sup> [EnergyCut.info/whyalla-case-study](https://www.energycut.info/whyalla-case-study)

### The world's first hybrid light tube

Solatube have invented a hybrid light tube that is supplemented by LED lighting, an occupancy sensor and a daylight sensor that continually monitors light levels.

When daylight is present, the light tube deactivates the LED lighting. When daylight wanes, it turns the lights on - but only if someone is present in the room!

This hybrid lighting system is an Australian invention that can cut lighting energy use by up to 94%.<sup>17</sup>



<sup>17</sup> [EnergyCut.info/solatube-hybrid](http://EnergyCut.info/solatube-hybrid)

# Low-cost money-saving adjustments

## Zone your lighting

If you have a single light switch for a large space, you can end up lighting areas where nobody is working. That can waste a lot of energy.

The solution to this is to split the large area into different zones and then allocate a new light switch to each zone.

That way, when an area is not being used, you can switch off the lighting for that space. This can be done without affecting the staff members in other areas.



When zoning an area in this way, there are issues that you need to take into account:

- If your light switches are poorly located, your electrician can advise you on the cost of installing new switches in more convenient positions.
- Do you have light switches located close to where people work? Doing this makes it easier for them to turn off the lights when they're not using them.
- Consider installing sensors that switch lights off after a period of inactivity. That way, your lighting will only operate when staff members are present.
- Do you have light switches near your exits? This can make it easier for people to turn off the lights when they leave the building.





## Save money with motion detectors and timers

Places like toilets, lunch rooms, coolrooms, storage rooms, warehouses, photocopying and meeting rooms are not consistently used throughout the day.

To cut the lighting bills in these rooms, why not install motion detectors or push-button timers that only turn on lights when someone is in the room?

The savings from motion detectors can be significant:<sup>18</sup>



<b>Open office:</b>	energy savings from 15–35%
<b>Meeting rooms:</b>	energy savings from 20–65%
<b>Toilets:</b>	energy savings from 30–90%
<b>Warehouses:</b>	energy savings from 50–90%
<b>Storage rooms:</b>	energy savings from 45–80%

Every time a member of staff visits the bathroom or has a meeting, the light coming on will remind them about your energy-saving push.

You can also rest safe in the knowledge that when there's nobody in these rooms, the lights are automatically turned off.

For advice regarding passive infrared, microwave, acoustic and ultrasonic detector sensors, talk to an EcoSmart Electrician or a local electrician.

**Did you know?** Modern motion detectors are far better than they used to be. In the past, you could be sitting in a meeting room and the lights would go out. This would result in people waving their arms to trigger the lighting back on.

That no longer needs to happen as some motion detectors can detect body heat or generate microwave pulses that pick up the presence of people in the room.

<sup>18</sup> EnergyCut.info/motion-analysis

## WT Sustainability, NSW

Using energy efficient lighting is just one of the ways that's helping WT Sustainability to use 78% less energy than a similar-sized tenancy. That's a saving of \$6,600 per year.

Their highly efficient Envirolite E1 fittings are dimmable and movement sensors control lighting in zones of 30sqm or less. If no occupancy is sensed after five minutes, the lights dim to 50%. After a further five minutes they turn off altogether. Sensor times in infrequently occupied areas, such as tea and photocopier areas, are even quicker.<sup>19</sup>

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***Motion detectors and sensors do cost money to install, however the ongoing energy savings are guaranteed.***

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## Use reflectors to boost your usable light output

When you install reflectors above your lighting, you can significantly boost the usable light output.

When you install them behind fluorescent tubes, you can boost light levels to the extent that you only have to use one fluorescent tube instead of two. This is the process that takes place during delamping - it can be a cost-effective way to improve the energy efficiency of your existing lighting.

Talk to a lighting expert to see whether reflectors can play a role in improving the energy efficiency of your lighting set-up.



*CFL light with reflector behind it*

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<sup>19</sup> [EnergyCut.info/office-pro-case-study](http://EnergyCut.info/office-pro-case-study)



## Reduce your energy costs with task lighting



Overhead lighting can be reduced in specific areas when it's supplemented by desk lamps and other forms of task lighting.

- Task lighting individual work spaces allows you to reduce the amount of overhead lighting you're using.
- Task lights can also be combined with dimmable space lighting. Dimmable energy-saving Compact Fluorescent Lamps (CFLs) and LEDs are now available for overhead lighting.
- If staff members work after-hours, encourage them to use task lighting so the main lights can be switched off.

## Improve the energy efficiency of your signage

If you use translucent signage, it pays to line the inside of the light box with reflective material. This can improve the lighting output of the signage.

If the reflective material makes the signage too bright, simply remove or reduce the lighting levels in the box. This will correct the lighting level and reduce your running costs at the same time.

If you're not sure how to do this, talk to your electrician the next time they visit.

**Your electrician may also be able to install energy efficient LED lighting in your signage. Talk to them for advice on whether this is a cost-effective move for your business.**

### McDonald's signage savings

Each McDonald's 'arch' used to consume a large amount of electricity due to the number of T8 lighting tubes required. However, they are now retrofitting their arches with 50,000-hour lifespan LEDs.

In addition to major reductions in lighting electricity use, the new LED lighting increases the time between lamp replacements which leads to decreased maintenance costs. This results in a significant saving. Indeed, McDonald's report that "maintenance savings outweigh energy savings".

The retrofits being undertaken do not alter the look of the signs as only the light fittings are upgraded. McDonald's reported that the LED lighting "actually improves uniformity" and that the payback period was 1.6 years.<sup>20</sup>



<sup>20</sup> Sourced from the McDonald's 2013 EEO report.



## Lighting alternatives that save you money

Want to upgrade your lighting, but you're not sure which lights to choose? The NSW OEH has developed a tool that will help you to identify the most energy efficient alternatives to your current lighting set up.

It's called 'Calculight - the energy efficient lighting upgrade calculator'. This tool can:

- help you to identify appropriate, cost-effective energy efficient lighting upgrades for common types of lighting
- show you a number of options and help you to make the best choice for your business
- compare lighting upgrade options and lets you sort the results by annual energy savings, capital costs and payback periods
- give you generic technical specifications, so that you can confidently approach lighting suppliers and contractors.

**Tip:** When using this tool, in the column marked 'Current price of ESC' type "0".

The Calculight tool can be found here: [EnergyCut.info/lighting-tool-app](https://EnergyCut.info/lighting-tool-app)

### Alternatives for standard incandescent globes

Although traditional incandescent globes were phased out back in 2010, some businesses still use them. Given that they use up to 85% more power than their energy efficient alternatives, it makes sense to replace them sooner rather than later.

Incandescent globes only last for 750–1,000 hours, but an LED globe can last for up to 50,000 hours. The savings that you'll make by switching to 'Compact Fluorescent Lamp' (CFL) or LED globes are listed below.



*Incandescent globe*

Alternative lighting	Estimated lifespan	Estimated running cost reduction <sup>21</sup>
Halogen GLS	2,000 hours	up to 30%
CFL	8,000–15,000 hours	up to 80%
LED	25,000–50,000 hours	up to 85%

<sup>21</sup> Source: DoSomething. Stat compares a 75W incandescent to a 15W CFL and an 11W LED. Savings also depend on the quality of lighting you buy.

If you want to check out and compare the full range of LED lamps and CFLs, the best place to do so is at a specialist lighting shop. Unlike the energy efficient lamps of yesteryear, they now come in a wide range of sizes and they give out a wonderful quality light.



*Left to right: incandescent, CFL and LED globes. LED lights last longer and use less energy than CFL and incandescent globes.*

### **‘Watt’ to look for when replacing incandescent lights**

When it comes to replacing incandescent globes, it’s important to know what lighting will give you the same amount of brightness.

The brightness of a light is measured in ‘lumens’. This table shows you what to look out for when replacing incandescent globes with CFL and LED lighting.

<b>Lumens (Brightness)</b>	<b>Ordinary Incandescent Globe</b>	<b>CFL</b>	<b>LED</b>
250	25W	7W	4W
400	40W	9W	6W
600	60W	11W	8W
800	75W	15W	11W
1,050	100W	20W	14W
1,300	120W	23W	18W

*When your CFL globes expire, replacing them with LED will reduce your energy use.*



*CFL globe*



## Alternatives for T8 twin fluorescent tube lighting

A significant number of small to medium sized businesses use fluorescent lighting.

The most commonly used are the recessed troffers that contain twin T8 (36W) tubes (the 'T' tells you that the light is tubular and the 8 tells you the lamp is  $8 \times \frac{1}{8}$  of an inch in diameter or 26mm).



*T8 tubes*

When it comes to installing alternatives to T8 tubes, talk to your EcoSmart Electrician, local electrician or lighting store about what you can do yourself and what needs to be professionally installed.

## How much can you save by replacing T8 (36W) twin fluorescent tubes?

Many businesses have replaced their T8 fluorescent tubes with LED tubes and T5 fluorescent tubes that use the same fixtures and fittings.

However there are a range of options that you may want to consider. The following table shows the main energy-saving alternatives to T8 (36W) twin fluorescent tubes.<sup>22</sup>

Alternative lighting options	Estimated lifespan of new lighting	Estimated running cost reduction <sup>23</sup>
Install new reflector, electronic ballast and lampholders/wiring harness; use only 1 T8 tube	Goes from 2 tubes to 1. Remaining T8 tube lasts for 12,000–16,000 hours	50–70%
T8 to T5 tube (28W) conversion kit <sup>24</sup>	16,000–20,000 hours	20–50%
New twin T5 (28W)	16,000–20,000 hours	30–40%
New single T5 (28W)	16,000–20,000 hours	60–67%
Pair of linear LED replacement lamps (2x19W)	Up to 50,000 hours	50–70%
New 30W integrated LED luminaire <sup>25</sup>	30,000–50,000 hours	60–67%



The standard T8 fluorescent tubes can now be replaced with T5 tubes that use less energy. However, LED lighting tubes can last longer than both T8 and T5 tubes.



LED lighting tube

22 A more detailed version of this table is available on page 25 of the NSW OEH 'Energy Efficient Lighting Technology Report': [EnergyCut.info/oeh-lighting-tech-report](http://EnergyCut.info/oeh-lighting-tech-report)

23 This is dependent on the quality of lighting that you buy.

24 If you do make modifications to an existing light be sure to check who is responsible for the product warranty. The original manufacturer may no longer cover the product if changes are made.

25 This is the recommended option in the NSW OEH 'Energy Efficient Lighting Technology Report'.





## Paperbark Merchants, WA

Paperbarks newsagency and bookshop upgraded all their inefficient fluorescent lighting to LED tubes.

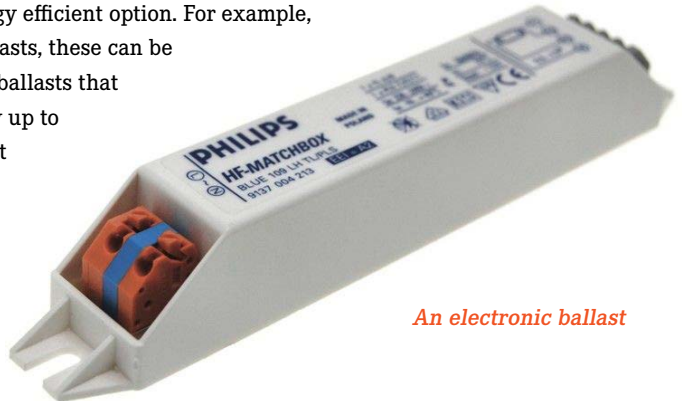
In addition to reducing their energy bills by thousands of dollars, the LEDs have had other benefits for the business. The brighter light meant Manager Hamish Cameron was able to delamp by over 30%. As the LEDs emit less heat, they also reduced their air-conditioning costs.

Furthermore, unlike fluorescent tubes, the new LED lighting does not cause any fading or discoloration of magazines and books.<sup>26</sup>

## Save money by changing the lighting ballast

Sitting alongside your fluorescent tubes is a ballast. This component controls how much electricity goes to the fluorescent tubes.

Ask your EcoSmart Electrician whether your ballasts can be upgraded to a more energy efficient option. For example, if you have magnetic ballasts, these can be replaced with electronic ballasts that can reduce energy use by up to 17–25% and increase light levels by 10%.<sup>27</sup>



*An electronic ballast*

<sup>26</sup> Source: DoSomething

<sup>27</sup> Source: EcoSmart

## Alternatives for halogen downlights

Halogen downlights are one of the most common forms of lighting in Australia.

They are often used by SMEs in showrooms, reception and retail areas, but are also used in normal office environments, for which they are extremely unsuited.

A halogen light (50W) will only last for up to 1,000-2,000 hours.<sup>28</sup> In stark contrast, LED downlights can last for up to 50,000 hours.

In addition to using up a lot of electricity, halogen downlights give out lots of heat – they can get as hot as 370°C. This contributes to an increase in the running costs of your air-conditioning and it also poses a fire risk.<sup>29</sup>

Where halogen lights are used, they often get used in large numbers. This can increase the cost of your lighting and air-conditioning bills. The following table will show you the money-saving alternatives to this form of lighting.



*Halogen downlight*

### Ebony Hair, NSW

Ebony Hair is a busy hairdressing salon in Manly. They replaced all 60 of their 50W halogen downlights and replaced them with 6W LED downlights. This action will save an estimated \$3,300 per year on their energy bills.<sup>30</sup>

<sup>28</sup> [EnergyCut.info/led-compare](http://EnergyCut.info/led-compare)

<sup>29</sup> [EnergyCut.info/nsw-fire-halogen](http://EnergyCut.info/nsw-fire-halogen)

<sup>30</sup> [EasyBeingGreen.com.au](http://EasyBeingGreen.com.au)



## How much can you save by replacing 50W halogen downlights?

The following table shows the main energy-saving alternatives to 50W halogen downlights.<sup>31</sup>



LED  
downlight<sup>32</sup>

Alternative lighting	Estimated lifespan of new lighting	Estimated running cost reduction <sup>33</sup>
35W infrared coating (IRC) halogen lamp (without an electronic transformer) <sup>34</sup>	up to 2,000 hours <sup>35</sup>	31%
35W infrared coating (IRC) halogen lamp (with an electronic transformer)	up to 6,000 hours <sup>36</sup>	42%
15W compact fluorescent lamp	up to 16,000 hours	70–80% <sup>37</sup>
New 13W compact fluorescent luminaire	up to 16,000 hours	70–80%
16W LED luminaire replaces existing luminaire and power supply with brand new components <sup>38</sup>	up to 50,000 hours	60–80%
7W LED retrofit replacement lamp (no new equipment needed) <sup>39</sup>	up to 50,000 hours	60–83%



31 A more detailed version of this table is available on page 52 of the NSW OEH 'Energy Efficient Lighting Technology Report': [EnergyCut.info/oeh-lighting-tech-report](http://EnergyCut.info/oeh-lighting-tech-report)

32 Image source: [www.internationalleds.co.uk](http://www.internationalleds.co.uk)

33 This is dependent on the quality of lighting that you buy.

34 The 35W infrared coating (IRC) halogen lamp (without an electronic transformer) can be placed into the existing halogen fitting. Similarly, the 10W LED lamp can also fit into the existing halogen fitting. Check with your lighting technician to see if it's more cost-effective to totally replace the existing light fittings.

35 This is dependent on the brand. Some cheap halogen downlights can last for only 1,000 hours.

36 This is dependent on the brand. Many cheaper varieties will not last this long.

37 According to the NSW OEH, CFL 'light output may be very low and not at all like the existing output'.

38 "This is the recommended option in the NSW OEH 'Energy Efficient Lighting Technology Report'.

39 Check the LED retrofit lamp is compatible with the existing transformer in the ceiling. If you are dimming the new LED, check the compatibility with the dimmer as well.

When it comes to installing these alternatives, talk to an EcoSmart Electrician, your local electrician or a specialist lighting store about what you can do yourself and what needs to be professionally installed.

### The benefits of LED downlights

When it comes to replacing a 50W halogen downlight, a LED downlight is your best money-saving solution. In addition to lasting up to 50,000 hours, they give out a high-quality light and use up to 83% less energy. They can also be dimmable.

### Kerry's Automotive Group, NT

Kerry's Automotive have saved more than \$25,000 a year by making extensive changes to their lighting. They have switched from high-intensity halogen lights to more energy efficient LEDs.

They're also using a timed electrical system that turns off the lights when they're not in use. The Systems Manager, Corey Heuvel, says the LEDs are not only saving money, but providing 'cleaner light' too.<sup>40</sup>

### Fire and halogen downlights

If they are not properly installed, maintained and insulated, halogen lights can be dangerous.

Fire and Rescue NSW have stated that there have been a significant number of fires relating to halogen downlights over the last five years.

That's why it makes sense to replace halogen lights with a low-heat LED alternative.

For more information on the risks of halogen lights visit: [EnergyCut.info/-halogen-nsw-fire](https://www.energycut.info/-halogen-nsw-fire)



<sup>40</sup> [EnergyCut.info/garages-mechanics-case-study](https://www.energycut.info/garages-mechanics-case-study)

## Alternatives for high-bay and low-bay lighting

High-bay and low-bay lighting is traditionally used in warehouses, workshops, fitness centres and other premises with high ceilings.

Installing long-life energy efficient lighting in these areas doesn't 'just' save money on energy costs.



The cost of hiring a technician to come out and change expired lighting with a scissor lift platform can be time-consuming and expensive. As such, long-life lighting can help to reduce the maintenance costs that come with replacing failed high-bay or low-bay lights.

When choosing high-bay and low-bay lighting, get independent advice from an EcoSmart Electrician or specialist lighting technician with experience in this area.

- ▶ **How much can you save by replacing 400W mercury vapour lamps?**
- ▶ **How much can you save by replacing 400W metal halide luminaires?**
- ▶ **Install an 'active reactor' ballast on existing high-bay lighting**
- ▶ **Saving money with high-bay and low-bay induction lighting**

### Newcastle Auto Electrics, NSW

Newcastle Auto Electrics are saving \$12,000 a year after an energy assessment revealed their lighting was outdated and inefficient and accounted for a large percentage of their overall electricity use. They replaced 192 T8 fluorescent tubes with LED tube lighting. This achieved an 80% reduction in energy use. They also replaced their existing 400W high-bay lights with a 150W LED alternative.<sup>41</sup>

#### Put in place a maintenance program

**When you upgrade high-bay and low-bay lighting, put in place a maintenance program. This will maximise the efficiency of the new lighting.**

<sup>41</sup> [EnergyCut.info/newcastle-auto](http://EnergyCut.info/newcastle-auto)

## How much can you save by replacing 400W mercury vapour lamps?



Mercury vapour lamp<sup>43</sup>

The following table shows the main energy-saving alternatives for high-bay and low-bay 'mercury vapour' lighting.<sup>42</sup>

An EcoSmart Electrician or lighting professional can tell you which of the following are the best options for your organisation.

Alternative lighting	Estimated lifespan of new lighting	Estimated running cost reduction <sup>44</sup>
New 250W metal halide luminaire	10,000 hours	30-40%
New 200W induction lamp luminaire	60,000 hours	40-51%
New 4x54W fluorescent luminaire	12,800 hours	45-55%
New 110W LED luminaire <sup>45</sup>	50,000 hours	55-75%



### What is the difference between a lamp and a luminaire?

The actual light source is called a lamp or illuminant. The light fitting with the lamp is called a luminaire.<sup>46</sup>

## Neata Glass and Aluminium, NT

Neata Glass and Aluminium in Alice Springs replaced 24 mercury vapour high bays (400W) with 14 induction high bays (250W). The capital cost was \$6,085 and the payback is \$5,689 a year. Over the lifetime of the new lights, they will save tens of thousands of dollars on their lighting costs.<sup>47</sup>

<sup>42</sup> A more detailed version of this table is available on page 69 of the NSW OEH 'Energy Efficient Lighting Technology Report': [EnergyCut.info/oeh-lighting-tech-report](http://EnergyCut.info/oeh-lighting-tech-report)

<sup>43</sup> [www.crompton.com.au](http://www.crompton.com.au)

<sup>44</sup> This is dependent on the quality of lighting that you buy.

<sup>45</sup> This is the recommended option in the NSW Govt OEH 'Energy Efficient Lighting Technology Report'.

<sup>46</sup> [EnergyCut.info/hera-lighting](http://EnergyCut.info/hera-lighting)

<sup>47</sup> [EnergyCut.info/neata-ds](http://EnergyCut.info/neata-ds) & [EnergyCut.info/neata-asc](http://EnergyCut.info/neata-asc)



## How much can you save by replacing 400W metal halide luminaires?

The following table shows the main energy-saving alternatives for high-bay and low-bay 'metal halide' lighting.<sup>48</sup>

An EcoSmart Electrician or lighting professional can tell you which of the following are the best options for your organisation.



*Metal halide lamp*

Alternative lighting	Estimated lifespan of new lighting	Estimated running cost reduction <sup>49</sup>
New 320W pulse-start metal halide luminaire	32,000 hours	20-30%
New 300W induction lamp luminaire	60,000 hours	30-40%
New 210W LED luminaire <sup>50</sup>	50,000 hours	40-54%



<sup>48</sup> A more detailed version of this table is available on page 79 of the NSW OEH 'Energy Efficient Lighting Technology Report': [EnergyCut.info/oeh-lighting-tech-report](http://EnergyCut.info/oeh-lighting-tech-report)

<sup>49</sup> This is dependent on the quality of lighting that you buy.

<sup>50</sup> This is the recommended option in the NSW OEH 'Energy Efficient Lighting Technology Report'.

## Install an ‘active reactor’ ballast on existing high-bay lighting

The ‘active reactor’ is an electronically controlled magnetic ballast that’s designed to reduce the running costs of existing high-bay metal halide or high-pressure sodium lamp lighting.

It can reduce the running costs of metal halide lighting by up to 17.5% and up to 22.5% for standard high-pressure sodium lamps.<sup>51</sup>

As an additional benefit, retrofitting it onto your existing lighting set-up can extend the life of your metal halide lighting by a third. It can also extend the life of high-pressure sodium lamps by at least half.

The active reactor can also be used on brand new lighting. It needs to be installed by an EcoSmart Electrician or a suitably-qualified local electrician. Talk to them for more advice about this option.

For more information, visit [ActiveReactor.com.au](http://ActiveReactor.com.au).



*The Active Reactor*

### Halifax Holiday Park, NSW

Halifax Holiday Park reduced their energy bills by almost a quarter with various measures, including extensive lighting changes. They replaced electric powered park lighting with solar bollards and installed efficient LEDs in all cabin garden beds.

Timers control the exterior park lighting in public areas and sensors activate lighting in the laundry and amenities only when required. “Having seen how well it’s working, we will now continue to replace all lighting with LEDs and solar,” said Park Manager, Robert Robinson.<sup>52</sup>

<sup>51</sup> [EnergyCut.info/vecci-active-reactor](http://EnergyCut.info/vecci-active-reactor)

<sup>52</sup> [EnergyCut.info/caravan-holiday-parks-case-study](http://EnergyCut.info/caravan-holiday-parks-case-study)





## Saving money with high-bay and low-bay induction lighting

### The Good Guys, NT



The Good Guys outlet in Darwin made the switch to energy efficient induction lighting for its bay lighting. Over the lifetime of this lighting, the store's owners expect to reduce their energy costs by up to \$900,000. This more than covers the \$75,000 upfront cost.

Given the high temperatures in their warehouse roof area, the company went with induction lighting instead of LED. There was concern that LED lighting would not cope long-term with the higher roof temperatures in this Darwin retail outlet.

Induction lighting is high quality and has long warranties of 5 years or more. Because induction lighting can last for 60,000–100,000 hours, maintenance costs associated with light replacement are significantly reduced. The lesser heat output also results in reduced air-conditioning costs.<sup>53</sup>

#### Funding an induction lighting upgrade

**The high upfront costs of induction lighting may be prohibitive for some organisations. However, financing options are available where some companies cover the cost of installation in return for a share of the generated savings.**

**Alternatively, you may be able to apply for grant assistance.**

<sup>53</sup> [EnergyCut.info/dosomething-research](https://www.energycut.info/dosomething-research)

## Alternatives for outside lighting

Many small businesses are unaware that there are energy efficient alternatives for outside lighting.

This section will show you how to reduce the energy costs associated with lighting for security, car parks, entry areas, walkways and building illumination.

In addition to switching to energy efficient lighting, you should also look to install:

- **Motion detectors** - where these are appropriate, they stop outside lighting from being left on for extended periods. They can enhance security whilst helping to reduce lighting costs.
- **Daylight sensors** - linking a daylight sensor to the lights on the perimeter of your building ensures that they remain off during the daytime.

### Using solar for outside lighting

**If you have an outdoor pathway that needs to be lit at night, install solar lights. They don't have to be installed by an electrician and during the day they get recharged by the sun.**

## Cutting the cost of halogen floodlights

Halogen lighting for outside use can be very cheap to buy, but it uses a lot of energy and might only last for up to 2,000 hours.

The following table shows the main energy-saving alternatives when it comes to replacing an outside 500W halogen floodlight.<sup>54</sup>

An EcoSmart Electrician or lighting professional can tell you which of the following are the best options for your organisation.



*Halogen floodlight*

<sup>54</sup> A more detailed version of this table is available on page 87 of the NSW OEH 'Energy Efficient Lighting Technology Report': [EnergyCut.info/oeh-lighting-tech-report](http://EnergyCut.info/oeh-lighting-tech-report)



Alternative lighting	Estimated lifespan of new lighting	Estimated running cost reduction <sup>55</sup>
New 150W metal halide floodlight	10,000 hours	66%
New 110W LED floodlight <sup>56</sup>	50,000 hours	82%



## Easy Carwash, NT

Easy Carwash in Alice Springs replaced 25 metal halide floodlights (250W) with 150W induction lamps. The instant 'strike and re-strike' nature of induction lighting also enabled them to install motion sensors, which generated further savings. The capital cost was \$12,265 and the payback is \$4,127 a year. Given the long life of induction lighting, the eventual savings will add up to many thousands of dollars.

If they had installed LED floodlights, the savings could have been even bigger still.<sup>57</sup>

## Cutting the cost of PAR lamp floodlights

Some floodlighting uses halogen PAR lamps. These can be replaced by CFL or LED floodlights.<sup>58</sup>

Installing CFL or LED floodlights brings about cost savings due to their longevity and the efficient way they use energy.

- CFL floodlights can reduce energy running costs by up to 60%.
- LED floodlights can reduce energy running costs by up to 73%.<sup>59</sup>



PAR lamp

<sup>55</sup> This is dependent on the quality of lighting that you buy

<sup>56</sup> This is the recommended option in the NSW OEH 'Energy Efficient Lighting Technology Report'.

<sup>57</sup> EnergyCut.info/dosomething-research & EnergyCut.info/easycarwash-asc

<sup>58</sup> EnergyCut.info/par-floodlight-replacement

<sup>59</sup> NSW OEH 'Energy Efficient Lighting Technology Report'

## Alternatives for exit and emergency lighting

Exit signs are often on 24 hours a day. A simple way to save money on their running costs is to replace them with energy efficient LED exit signs.

The savings can be significant.

- A normal exit sign uses one or two 10W T8 tubes, which only last for up to 5,000 hours.
- New energy efficient exit signs using LED lighting can last for up to 50,000 hours. At the same time, they reduce energy use by 50-70%.<sup>60</sup>



In addition to saving on your energy costs, they also save you on the maintenance costs of replacing the T8 lighting tubes.

When undertaking changes to your emergency and exit lighting, ensure that all work done meets Australian Standard AS 2293.1-2005.<sup>61</sup> For more advice, talk to an EcoSmart Electrician or a local electrician with experience in this area.

### Emergency lighting

**If your business needs advice on energy efficient emergency lighting, you can get it from page 94 of the [‘Energy Efficient Lighting Technology Report’](#) from the NSW Office of Environment and Heritage.**

**It is downloadable from here: [EnergyCut.info/oeh-lighting-tech-report](http://EnergyCut.info/oeh-lighting-tech-report)**

<sup>60</sup> More information is available on page 94-95 of the NSW OEH ‘Energy Efficient Lighting Technology Report’: [EnergyCut.info/oeh-lighting-tech-report](http://EnergyCut.info/oeh-lighting-tech-report)

<sup>61</sup> [EnergyCut.info/aust-standard](http://EnergyCut.info/aust-standard)

# Making informed decisions

## How to buy good-quality LED lighting

When LED lighting first came out, quality assurance was poor and some lights expired well before their claimed lifespan. Over the last few years, however, the quality and duration of LEDs has significantly improved. But how do you know if an LED product will last as long as it claims?



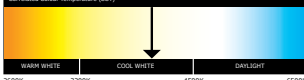
### Look out for the ‘Solid State Lighting (SSL) Quality Scheme Label’

Lighting Council Australia have created an easily searchable database of LEDs that carry the ‘SSL Quality Scheme Label’. This label tells you that an LED lighting product should perform as per the claims of the supplier.

If an electrician offers to install a brand of LED lighting in your business, search the database to see if the product is part of the SSL Quality Scheme:

[EnergyCut.info/ssl-quality-scheme](https://www.energycut.info/ssl-quality-scheme)

To participate in this SSL Quality Scheme, companies also have to be members of Lighting Council Australia.

Lighting Council AUSTRALIA		Brand Name: ABC Company Supplier/Product ID: 001/001
<b>LED Performance</b> Solid State Lighting Luminaire		
<b>Luminous Flux</b>	<b>865 lm</b>	
<b>Luminous Efficacy</b>	<b>58 lm/W</b>	
<b>INPUT POWER</b> TEST VOLTAGE 240V AC		<b>15 W</b>
<b>Colour</b> Correlated Colour Temperature (CCT)		4000 K
Colour Rendering Index (CRI, Ra)		85
<b>LIGHT COLOUR</b> Correlated Colour Temperature (CCT) <b>[4000K COOL WHITE]</b>		
		
Visit <a href="http://www.lightingcouncil.com.au">www.lightingcouncil.com.au</a> for the Label Reference Guide <small>The specifications above are contained in certified or accredited reports provided to Lighting Council Australia Ltd by the manufacturer/supplier of this product. Lighting Council Australia makes no representation as to the product's specification or suitability.</small>		
<input checked="" type="checkbox"/> Dimmable		<input type="checkbox"/> Non-dimmable

## Look for LED lighting that comes with a guarantee

Good quality brands offer guarantees on their LED lighting products. For LED lamps claiming to last 25,000 hours or longer, Lighting Council Australia recommends that you look for a guarantee of at least 2–3 years.

If a manufacturer claims that their LED light will last for 50,000 hours, they recommend that you look for a longer guarantee of up to 5 years.



LED lamp

## Want more information?

Lighting Council Australia have put together ‘A consumer guide to buying good quality LEDs’. This can be downloaded from [EnergyCut.info/led-consumer-guide](https://www.energycut.info/led-consumer-guide)

### Coles, locations around Australia

For cross-aisle lighting, Coles replaced existing fluorescent tubes with LED tubes and changed their orientation so that they were placed across the aisles. In addition to reducing energy use, this approach means the number of lights required can be reduced by 20%. The changed orientation also allows the floor space to be used more flexibly.



In freezer and coolrooms, they replaced existing (typically 1.2 m 36W) fluorescent tubes with efficient (18W) LED lights resulting in an energy saving of approximately 50%. The lighting is also brighter and has a longer life leading to a significant reduction in maintenance (relamping) costs. Less relamping also means fewer disruptions to operations.<sup>62</sup>

<sup>62</sup> [EnergyCut.info/dosomething-research](https://www.energycut.info/dosomething-research)



## What questions should you ask a lighting expert?



The following questions are a useful starting point. Have them to hand for your first meeting with an electrician or lighting advisor:

- What changes can we make without replacing our existing lighting?
- How can we make our existing lighting set-up more energy efficient?
- Are you able to advise on different lighting brands? (Bringing in someone who only represents one brand of lighting may not give you the best outcome.)
- Do you offer guarantees on the lighting you recommend?
- Do you have any case studies that show how you have helped similar companies to upgrade the efficiency of their lighting?
- Can we talk to someone who can vouch for the quality of your advice and service?

# Audit your workplace lighting

## How to do a room-by-room audit of your existing lighting set-up

If you want to cut the lighting bills in your business, you need to know:

- the types of lighting that are currently being used
- whether you have the correct lighting levels in all parts of your business
- the types of energy efficient lighting that could replace your current lighting set-up.

Once you have this information, you'll be better-placed to make improvements to your lighting set-up. You need to end up with the right lighting levels at the lowest cost. This section will show you how.

Download the 'Energy Reduction Plan' template here: [EnergyCut.info/erp-template](https://www.energycut.info/erp-template) and use the 'Room by room lighting audit' worksheet in Appendix E.

### Getting under way

To start your lighting audit, you, your tradesperson or lighting expert should start with a floor plan for your premises. If you don't have one, you can draw one by hand, or use software such as 'Floorplans Pro' for the iPad or 'Floor Plan Creator' for Android devices.

Make sure that you mark up your work stations, reception, meeting rooms, bathrooms, amenities, walkways, storeroom and kitchen etc.

You'll then be able to begin your room-by-room lighting audit.

- ▶ **How to do a basic room-by-room lighting audit**
- ▶ **Why should you measure lighting levels?**
- ▶ **What are the recommended minimum lighting levels for your business?**





## How to do a basic room-by-room lighting audit

Depending on the size of your lighting set-up, you may want to engage a lighting expert to do an audit for you. Alternatively, you could collect the basic information yourself, then take it to a specialist lighting shop and get replacement recommendations from the lighting expert there.

If you choose to collect the audit information yourself, go from room to room of your premises and do the following:

- **Make a list of your existing lighting set-up**

Make a note of the types and number of lights that you have in each area, eg. incandescent, halogen, T8/T5 fluorescent tubes, CFL globes, LED etc.

You can use the worksheet in Appendix E of the the 'Energy Reduction Plan' template to make your list. Download here: [EnergyCut.info/erp-template](https://www.energycut.info/erp-template)

In your list, make sure you write down the wattage level and the light type (CFL, incandescent etc) for each light (this tells you how much power it uses).

A lighting expert can use this list to give you money-saving recommendations for more efficient lighting alternatives.

- **Write down the current lighting level for each area**

To measure the lighting level for each area, you will need a 'lux' meter. Use this to measure the lux level reading for each room, then write this down on your floor plan.

This will tell you whether each area is above or below the recommended Australian Standard lighting levels. These are detailed in the next point.



*Lux meter*

### Buying a lux meter

You can buy a quality lux meter on eBay for a little as \$15-\$40: [EnergyCut.info/lux-meters](https://www.energycut.info/lux-meters). You can also download lux meter apps for iPhones and Android phones, however a proper lux meter will give you the most accurate result.

## Why should you measure lighting levels?

The lighting levels that you need throughout your business can vary – for example you need more light to read than you do to visit the bathroom.

However, if you have a room that is brighter than it needs to be, you are wasting money on excess lighting.

Measuring the lighting levels of your premises will enable you to see which parts of your business are set too high or too low.

Excess lighting affects your energy bills, but poor quality lighting can also affect the productivity and well-being of your staff. It can also negatively impact on customer experience.

### Queens SUPA IGA, WA

Queens SUPA IGA uses timers to automatically turn their lighting off at 10pm and on at 4am. Changes have also been made to the way they use their light switches.

They move to ‘half-lighting’ mode during out-of-hours, stocking and baking times. Switching off half their lights during these periods saves them a lot of energy.

In the out-of-hours period they also move to departmental-only lighting. That way when the bakery team come in, they only turn on the lighting for their section. Colour-coded light switches make it easier for the different teams to know which lights apply to their department.

These simple measures are saving the business about \$3,000 a month – around \$36,000 per year.<sup>63</sup>

## What are the recommended minimum lighting levels for your business?

The following table shows the recommended lighting levels for different work environments. The following table can be downloaded and used while you do your walk-around audit: [EnergyCut.info/lighting-table](https://EnergyCut.info/lighting-table)

On your floor plan, mark up the current lighting levels, and the ones that are recommended for each area of your business.

This could tell you where you can save money by reducing your lighting levels. For example, the lighting levels in an office environment should be an average of 320 lux, but it’s often higher. When that happens, the energy bill will be higher too.

<sup>63</sup> [EnergyCut.info/queens-iga](https://EnergyCut.info/queens-iga)



## LIGHTING LEVEL TABLE

Minimum Illuminance (Lux)	Task difficulty and examples
40	<ul style="list-style-type: none"> <li>• corridors</li> <li>• walkways</li> </ul>
80	<ul style="list-style-type: none"> <li>• change rooms</li> <li>• loading bays</li> <li>• toilets</li> <li>• cleaners' rooms</li> <li>• locker rooms</li> <li>• bulky storage</li> <li>• internal stairs</li> </ul>
160	<p>Simple tasks:</p> <ul style="list-style-type: none"> <li>• general cafeteria area</li> <li>• general kitchen area</li> <li>• entrance halls</li> <li>• bathing rooms</li> <li>• lobbies</li> <li>• foyers</li> <li>• waiting rooms</li> <li>• rough bench work</li> <li>• general fabrication</li> </ul>
240	<p>Moderately easy tasks:</p> <ul style="list-style-type: none"> <li>• food preparation areas</li> <li>• training and seminar rooms</li> <li>• photocopying</li> <li>• medium woodworking</li> </ul>
320	<p>Moderately difficult tasks:</p> <ul style="list-style-type: none"> <li>• normal office work</li> <li>• meeting rooms</li> </ul>
400	<p>Moderately difficult tasks:</p> <ul style="list-style-type: none"> <li>• fine woodwork</li> </ul>

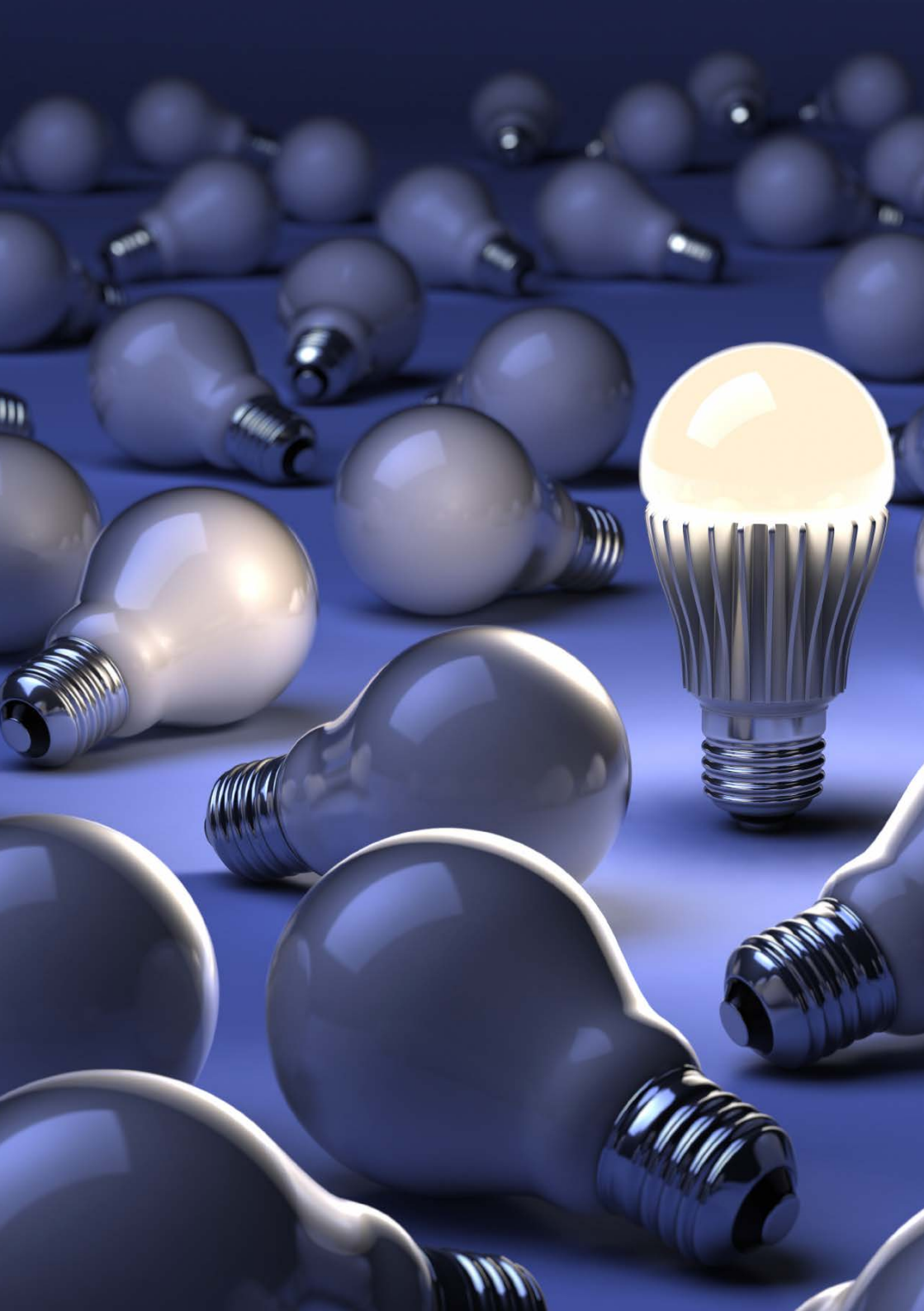
[continued >>](#)

Minimum Illuminance (Lux)	Task difficulty and examples
600	Difficult tasks: <ul style="list-style-type: none"> <li>• drawing boards</li> <li>• laboratories</li> <li>• inspection tasks</li> <li>• fine machine work</li> <li>• fine painting</li> <li>• colour matching</li> </ul>
800	Very difficult tasks: <ul style="list-style-type: none"> <li>• fine inspection tasks</li> <li>• colour matching of dyes</li> </ul>
1200	Extremely difficult tasks: <ul style="list-style-type: none"> <li>• graphic arts inspection</li> <li>• extra fine bench work</li> </ul>
1600	Exceptionally difficult tasks: <ul style="list-style-type: none"> <li>• jewellery</li> <li>• watch making</li> </ul>

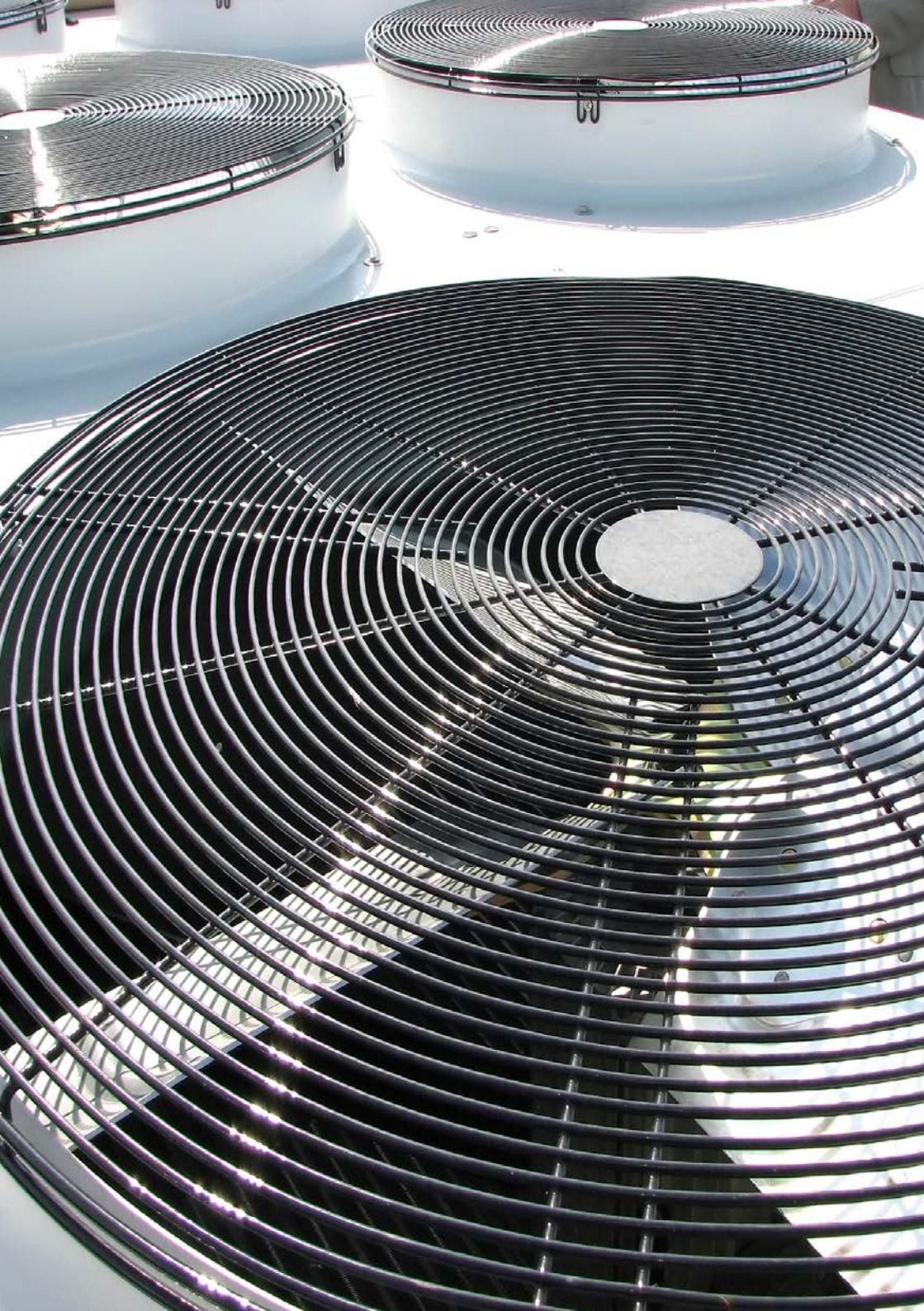
*Extract from Table 3.1 AS/NZS 1680.1:2006 – Interior and workplace lighting recommended maintenance illuminances for various tasks, activities or interiors  
Adapted from: CitySwitch and Sustainability Victoria ‘The Lighting Design Hierarchy’*

### Acknowledgement and thanks

Much of the information in this lighting step is based on the research in the NSW OEH ‘Energy Efficient Lighting Technology Report (Second edition 2014)’. We would like to thank David Malicki and the authors of this report, as it proved invaluable in the preparation of this chapter.









## STEP 9

# Lower your heating, ventilation and air-conditioning costs

**In 2012, air-conditioning-related energy bills cost Australians \$9 billion. We also spent nearly \$3.3 billion purchasing and installing new air-conditioning equipment.<sup>1</sup>**

If that \$3.3 billion had been spent on energy efficient equipment, then the \$9 billion running costs could have been significantly reduced.

The amount of energy being used by HVAC systems is enormous:

- Depending on how the building is being used, it's estimated that 40-52% of total energy consumption in commercial buildings is being used by HVAC systems.<sup>2</sup>
- It's also estimated that HVAC is responsible for 43% of the electricity used in office buildings.<sup>3</sup>

These days, energy efficient HVAC equipment utilises innovations such as reverse-cycle capability, inverters, natural refrigerants, heat recovery systems and inbuilt thermostats. However, technology is not always the answer.

Reducing your HVAC costs can be as easy as turning off air conditioners and extraction exhaust fans at the end of the working day. As this section will show, there is a wide range of equipment and behavioural changes that you can make to reduce your HVAC energy bills.

1 Cold Hard Facts 2, p.85, prepared by 'The Expert Group' on behalf of the DCCEE.

2 Cold Hard Facts 2, p.73, prepared by 'The Expert Group' on behalf of the DCCEE.

3 Cold Hard Facts 2, p.75, prepared by 'The Expert Group' on behalf of the DCCEE.



# Did you know?

## Step 9: HVAC

In 2012, air-conditioning-related energy bills cost Australians \$9 billion. We also spent nearly \$3.3 billion purchasing and installing new air-conditioning equipment.

See page 161

A one-degree difference on your thermostat setting can increase your heating or cooling bills by up to 10%.

See page 168

Poorly maintained HVAC equipment can increase its energy consumption by up to 30%.

See page 170

Turning down the thermostat as low as it can go doesn't speed up the cooling of your premises. Turning it up very high won't heat it faster either. Taking this approach will increase your bills as you will be overcooling or overheating your premises.

See page 168



See page 195

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**Fans only cost about two cents an hour to run and they can use up to 50 times less energy than air-conditioning units.**

**See page 176**



**See page 193**

**Newer heating and cooling systems can be 20–40% more efficient than older ones – even more if the old system has not been well maintained.**

**See page 183**

**Some radiant heaters can use up to 2,400W of electricity, so if you are buying one, it's best to buy one with multiple settings that are lower than this, eg 400W, 800W or 1,200W.**

**See page 179**

**Every extra star on an air conditioner can reduce your running costs by up to 10%.**

**See page 186**

**Many businesses waste money by using heaters when all they need to do is improve their insulation, eliminate draughts, use ceiling fans, and better utilise the warmth of the sun.**

**See page 194**



# In this step

## No cost/low cost

- ▶ The six HVAC rules that will save you money
- ▶ Using natural sources of heating, cooling and ventilation
- ▶ Watch your thermostat!
- ▶ Turn off your HVAC when it's not needed
- ▶ How maintenance saves on HVAC running costs
- ▶ Use a qualified technician to maintain your HVAC equipment
- ▶ Positioning your air conditioners for maximum efficiency
- ▶ Start your air conditioner earlier on a hot day
- ▶ Don't heat or cool areas that don't need it
- ▶ Consider the time of day you're using HVAC
- ▶ Install a timer on your air conditioner
- ▶ Where is it cheaper to work late?
- ▶ Use fans to cut your heating and cooling bills
- ▶ Keep your windows, vents and doors shut when using air-conditioning
- ▶ Save money by restricting the use of non-thermostat radiant heaters
- ▶ What to do if your heater or air conditioner doesn't have a thermostat?
- ▶ How floor mat heaters can save money

## **Invest & save**

- ▶ **How to save money when upgrading your air-conditioning systems**
- ▶ **Assessing running costs when buying cooling systems**
- ▶ **'Inverter' air conditioners and variable speed drives – why they're more energy efficient**
- ▶ **How to save money when upgrading your heating systems**
- ▶ **Can your business use heat recovery?**
- ▶ **Save money by zoning your ducted HVAC**
- ▶ **Further information on the energy efficient operation of HVAC systems**

# No cost/low cost

## The six HVAC rules that will save you money

When it comes to heating or cooling your business, there are six basic rules to follow:

- Get as much of your heating, cooling and ventilation as possible from natural sources.
- Watch your thermostat. Having the wrong settings can make a really big difference to your energy bills.
- Keep doors, windows and vents closed when your air-conditioning is on. Having them open can put more pressure on your HVAC system.
- Ensure that your HVAC system is properly maintained. This maximises its longevity and efficiency. Your EcoSmart Electrician or HVAC technical service provider can advise you on the best strategy.
- Take the ‘Goldilocks’ approach when buying HVAC equipment. You don’t want it too big or too small. You need a system that’s ‘just right’ for your operations.
- Get the most from your HVAC system. When you’ve got the system that’s ‘just right’ for your business, make sure that you use it in the most efficient way possible. Don’t turn it on unless you really need to.

### Gelato Blue, NSW

Gelato Blue saved \$2,000 a year after taking part in a state government energy efficiency program which advised them to improve their refrigeration and air-conditioning systems.

Insulation covers were specially developed for the ducted air-conditioning so that less energy was needed for cooling and heating the store. “The results exceeded our expectations,” said owner Constantinos Platis. “We have saved approximately 13% on our energy bills from the previous year.”

Inspired by the savings from the initial changes, they also installed a roof air ventilator for a more energy efficient way of cooling.<sup>4</sup>

<sup>4</sup> [EnergyCut.info/oeh-gelato-blue](http://EnergyCut.info/oeh-gelato-blue)



### Use the economy cycle

When it's cool outside, use the economy cycle on your air conditioner.

This brings in cooler air from outside and circulates it in your building.

This air is not artificially cooled so it reduces your air-conditioning bills.

## St Andrew's Cathedral School, NSW

At one of their two buildings, St Andrew's Cathedral School implemented an economy cycle on air conditioning units and switched them to 'manual' during school holidays, so they can be turned off when not in use.<sup>5</sup>

## Using natural sources of heating, cooling and ventilation

When it comes to HVAC, there is one simple way to maximise your savings – use natural sources of heating, cooling and ventilation as much as possible.

The more you use your 'artificial' heating, cooling and ventilation equipment, the more you'll pay for your energy bills.

**Natural ways to cool:** If it's cool outside and hot inside, all you have to do is open the windows and doors – ideally on opposite sides of your building – to facilitate cross ventilation. Just remember to turn off the air conditioner.

**Natural ways to heat:** Keeping warm is as simple as maximising the winter sun coming through windows; using the thermal mass of your building to store heat; closing the office blinds at night; and increasing insulation to keep heat in.

For more ideas on how to use nature to cool and warm your premises, check out 'Step 10 - Get comfortable with insulation'.

**It's surprising how many people open the windows during the hottest part of the day to 'cool down' their premises. Doing so only brings in hot air and makes the air conditioner work harder, increasing cooling costs.**

**If it's a hot day and the air-conditioning is on, make sure your staff are trained to keep the windows shut. You should only open windows when there is a cool change that can bring cooler air into your building. When you do this, you should turn off the air-conditioning.**

<sup>5</sup> EnergyCut.info/schools-case-study

## Watch your thermostat!

This has already been mentioned in our Step 7 thermostat section, but it can't be stressed enough.

Many workplaces set systems to a constant 20–24°C regardless of the weather and what people are wearing. However, your thermostat should be adjusted according to the season.



**Summer settings:** In summer your thermostat should be set to 24–27°C. If you set it at 27°C, this means your cooling will kick in only when the temperature reaches above 27°C. If that's too warm for your premises, adjust it down till you get a temperature that maximises staff comfort and energy savings.

**Winter settings:** In winter your thermostat should be set to 18–20°C. If you set it at 18°C, your heating will switch on when the temperature goes down below 18°C.

A one-degree difference on your thermostat setting can increase your heating or cooling bills by up to 10%. So if you're a few degrees over, you can be paying far more than necessary for your heating and cooling needs.

**More information:** For details on the important role that thermostats play in reducing your HVAC costs – see 'Step 7 - Watch your thermostat'.

### **Busting the thermostat myth**

**Turning down the thermostat as low as it can go will not speed up the cooling of your premises.**

**Similarly, when you come in from the cold, don't set the thermostat really high in the hope that it quickly warms up your workplace.**

**Doing this runs the risk of overcooling or overheating your premises. That just ends up increasing your energy bill.**

**The solution is simple. Just set the thermostat at the temperature you want it to get to and leave it there.**



## Turn off your HVAC when it's not needed

Turn off your HVAC systems overnight and on weekends when your building is not occupied. Using an automatic on/off timer to control your system facilitates this. These are provided as standard with most modern units, so if you have a timer, use it.

If a few people are working outside of normal operating hours, consider using efficient portable heaters or air coolers to ensure that the temperature is comfortable for them. This saves you having to heat or cool the whole building.

If your staff are working after-hours, encourage them to wear clothing that is temperature appropriate. For example, if it's winter, suggest they wear jumpers and scarves rather than automatically turning up the heating.

If your workers wear a uniform, ensure season-appropriate options are available.

Taking this approach can bring about significant savings in your HVAC bills.

### First National Framptons, NT

The First National Framptons real estate agency in Alice Springs asked their air-conditioning contractor to change the air conditioner start and finish times by just 30 minutes. This meant it started half an hour later in the morning and finished half an hour earlier at night. It may not seem like a lot, but this reduced the annual usage by 260 hours. The result is a saving of around \$850 a year.<sup>6</sup>

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*UK research shows that air-conditioning an office for an extra hour a day uses enough energy in a month to power a TV set for a year.<sup>7</sup>*

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<sup>6</sup> [EnergyCut.info/framptons](http://EnergyCut.info/framptons)

<sup>7</sup> [EnergyCut.info/cc-aircon](http://EnergyCut.info/cc-aircon)

## How maintenance saves on HVAC running costs

Poorly maintained HVAC equipment can increase its energy consumption by up to 30%.<sup>8</sup>

In order to minimise your HVAC running costs, you need to ensure that your equipment is regularly serviced in line with the manufacturer's recommendations. Your HVAC technical service provider or EcoSmart Electrician can advise you on the best ways to maximise the savings from your existing HVAC system.

From an efficiency point of view, you should regularly:

- clean your condenser coils, evaporators, and fans
- clean or change air-filters
- check valves, belts, refrigerant levels and insulation
- check that your economiser is working correctly
- check the bearings, motors and speed drives. When there are issues with your bearings, the motor has to work harder
- make sure any power outages have not affected your thermostat clock
- ensure that your dampers are operating correctly. This will stop hot or cold air coming in to your building when it's not required
- make sure the outside air grills are not blocked with plastic bags or other materials
- lubricate fan bearings
- fix refrigerant gas leaks. Your technician must have an ARCTick license to handle refrigerant
- fix any air leaks in your ducting.

Cleaning should be carried out on a quarterly basis as grime can build up in your HVAC coils, evaporators and fans. Finally, make sure your maintenance provider knows that energy saving maintenance is a strong focus for you. They may have additional ideas that will maximise your energy savings.

When filters are blocked, not enough air flow will get through. The motor will then have to work harder which increases its energy use and your bills. A blocked filter may also reduce the amount of conditioned air that ends up in your premises. A properly maintained filter is therefore critical to the efficient operation of your HVAC system; so

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<sup>8</sup> EnergyCut.info/cc-hvac





it's important to clean or regularly replace your filters. For many small systems, replacing filters is an easy task.

In addition to saving you money, maintaining your equipment will make it more efficient and reliable. It will also prolong its service life and the time until replacement.

## Use a qualified technician to maintain your HVAC equipment

HVAC costs are a big expense for many businesses. That's why you need to have your systems maintained on a regular basis. There are a number of technicians who can provide this service.

### Australian Refrigeration Council (ARC)



To find an authorised business in your area, check out this searchable database from the Australian Refrigeration Council (ARC):

[EnergyCut.info/arc-search](https://www.energycut.info/arc-search)

When you book a technician to install or fix your air conditioner, fridge or freezer, you can also check they hold a valid licence: [EnergyCut.info/arc-licence](https://www.energycut.info/arc-licence)

### The Australian Institute of Refrigeration, Air-conditioning and Heating (AIRAH)

AIRAH is a specialist organisation which represents over 10,000 air-conditioning, refrigeration, heating and ventilation professionals across Australia.

Members of AIRAH can help you with advice relating to:

- maintenance
- recommissioning
- retro-commissioning
- controls tuning
- advice on equipment replacement.



When calling around, ask if the service provider is an AIRAH member or look for M. AIRAH on their business card. For more information about AIRAH, visit [airah.org.au](https://airah.org.au). For advice on your cooling options and products, you can also use their [FairAir.com.au](https://FairAir.com.au) website.

## EcoSmart

An EcoSmart Electrician is a licensed electrical contractor who has undertaken additional training to become certified and accredited in energy efficiency.

They can give you professional assistance with your HVAC needs. You can search for a local EcoSmart Electrician by typing in your postcode at:

[EnergyCut.info/eco-smart](http://EnergyCut.info/eco-smart)



EcoSmartElectricians™

### Want to know more?

The Australian Refrigeration Council has published a free air-conditioning guide: [EnergyCut.info/arc-aircon-guide](http://EnergyCut.info/arc-aircon-guide)

## Positioning your air conditioners for maximum efficiency

With split-system air conditioners, the cooling and heating condensing unit is placed outside your business. This should be placed where it is least exposed to the sun, as direct sunlight will make the unit less efficient. If possible, you should also shade the unit and ensure that it's in a well-ventilated area.

Inside your business, make sure the air-conditioning fan unit is mounted high up on the wall or in the ceiling. Cool air sinks and hot air rises, so placing it higher up will make it more effective in cooling your premises. Ceiling or free standing fans are an effective supplement to air-conditioning, as they help to move the cool air around.

Access for future maintenance is also an important location consideration, for both outdoor (roof, wall, alley) and indoor (false ceiling, wall, plant room) units. To maintain your equipment, you have to be able to access it easily.



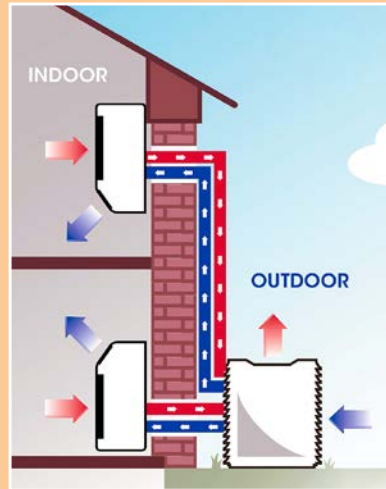


## What's the difference between split- and multi-split-systems?

**Split-system air conditioner:** this system has a fan unit mounted inside the building – a single condensing unit that generates the temperature changes is located outside. This type of air conditioner can cool or heat one or more adjoining rooms.

**Multi-split system:** this system also has one outdoor condensing unit, but this is linked to multiple internal fan units. Some brands can simultaneously heat or cool a number of rooms in your premises.

Split system air conditioners are the most commonly purchased type of air conditioners. But when buying one, make sure that it has an inverter, as this makes it cheaper to run. Some split-system air conditioners now come with a 7-star 'super efficiency' rating. This ensures a substantial reduction in running costs compared to older systems.



*A split-system air conditioner*

## Start your air conditioner earlier on a hot day

If you know that it's going to be a very hot day, you can start the air-conditioning slightly earlier while the air is still cooler.

Chilling cooler air uses less energy than cooling it at a later time when it's hotter. This gives you a head start on cooling your workplace on hot days.

You can do this manually or you can set your system timer to come on earlier just before people come to work.

**This approach should only be used on exceptionally hot days.** During regular weather, at the start of the day you should turn on your air-conditioning as late as possible.

## Don't heat or cool areas that don't need it

Try to avoid heating and cooling little-used areas. Block off the ducting outlets in areas that are unoccupied, and reduce the heating and cooling of areas that are used only for a short time, such as toilets and storerooms. Also don't forget to close the internal doors of rooms being heated or cooled.

Consult your HVAC technical service provider or EcoSmart Electrician before you block off outlets. This will ensure that you are not creating too much back pressure for the compressor, or putting other parts of the system under undue pressure.

### Rewire your restrooms

**If you have fans in your restrooms, why not rewire them so that they only come on when the lights are switched on? If the room has natural light, such as a window or skylight, a motion sensor may work better.**

**This will reduce the amount of energy that they use.**

**Before implementing this, check with your EcoSmart Electrician as to how much this will cost and how much energy it could save.**

### Wynnum North Newsagency, QLD

Wynnum North Newsagency reduced their energy bills by 33%, or \$1,759, by switching off air-conditioning and other measures. They had previously used two air conditioners as well as two air curtains over the front door, to cool the shop during Queensland's hot summer days.

They have now permanently switched off the air curtains and operate only one air conditioner in winter when necessary. They only use both air conditioners on hot summer days and only when the internal store temperature rises above 24°C.

According to owner John Allen, this has resulted in no loss of comfort inside the store.<sup>9</sup>

<sup>9</sup> [EnergyCut.info/newsagencies-case-study](http://EnergyCut.info/newsagencies-case-study)



## Consider the time of day you're using HVAC

If you're on a flat rate electricity contract where you pay the same rate throughout the day, then it pays to minimise the use of HVAC at all times.



However, if you're on a 'time-of-use' contract with your energy provider, you'll be paying more for electricity during 'peak' periods.<sup>10</sup> If this is the case, it pays to minimise the use of your HVAC equipment during late afternoon 'peak' times, as this is when electricity is at its most expensive.

If you have to use HVAC, try to do so during 'off-peak' or 'shoulder' times of the day when the energy is cheaper, or offset the cost by switching off other equipment.

## Install a timer on your air conditioner

When you connect a timer to your air conditioner, you can significantly cut its energy use. This enables it to switch on and off at set times.

You can also install a push button timer. With this, the air-conditioning only comes on when the button is pressed and the inbuilt timer ensures that the system turns itself off after a set period. This stops the air conditioner accidentally being left on during mild days, after-hours and on weekends.

A push button timer for your air-conditioning unit has to be installed by an EcoSmart Electrician or a licensed technical services provider. The cost of the push button and installation will be about \$300.<sup>11</sup>

However, it's an investment that can get returned in the form of ongoing energy savings and lower running costs.



<sup>10</sup> If you're on 'time-of-use' pricing this can be between 2-8pm, but check with your energy provider for the times in your area.

<sup>11</sup> [EnergyCut.info/vecci-aircon-timers](http://EnergyCut.info/vecci-aircon-timers)

## Where is it cheaper to work late?

If you own your own business and you're going to work late then there are two options to reduce your heating bills:

- Your home is usually heated on cold evenings, so if you're going to work late, you could save money on heating costs by working from home.
- If you're staying back at work, is there a small office where you can shut the door to keep the heat in?

## Use fans to cut your heating and cooling bills

Fans only cost about two cents per hour to run<sup>12</sup> and they can use up to 50 times less energy than air-conditioning units.<sup>13</sup>

They're also very versatile - you can mount them on your ceiling, on your walls or move them from room to room. Regardless of what type of fan you use, they're an extremely cheap way to reduce your HVAC bills.

### Using fans in summer

You can use ceiling, wall, or free-standing fans to increase the cooling efficiency of your central air-conditioning.

The evaporative, or 'wind-chill' effect of air movement from fans means that people can feel just as cool with the thermostat set a number of degrees higher than normal.



### Using fans in winter

Because hot air rises, in winter you should set your ceiling fan on a low speed in a 'clockwise' direction. This sends warm air near the ceiling back down to where you and your staff are. It's a very cheap way to redistribute heat and can potentially reduce your heating costs by up to 10%.<sup>14</sup>



<sup>12</sup> [EnergyCut.info/compare-appliance-costs](https://www.energycut.info/compare-appliance-costs)

<sup>13</sup> [EnergyCut.info/fan-energy](https://www.energycut.info/fan-energy)

<sup>14</sup> Savings can vary according to fan size and how the fan is used. Stat from [EnergyCut.info/fan-tips](https://www.energycut.info/fan-tips)



### Encourage temperature-appropriate clothing

In winter, it's also appropriate to expect your staff to wear winter clothes. If someone is wearing a T-shirt and complains that it's too cold, why not send an email reminder to all staff to wear winter-appropriate clothing to work?



### Fans on high ceilings

If you have very high ceilings in your premises, for example in a warehouse, you may want to invest in thermal destratification fans.<sup>15</sup> These can blow warm air back down to where people are sitting or walking around. It's estimated that these can reduce heating energy use by up to 20%.<sup>16</sup>

If your ceiling is excessively high, you may also want to install a hanging ceiling.

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***When you leave a room, you should always turn off the lights. Make sure you do the same with your ceiling fans!***

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### Greener Cleaner, NSW

Greener Cleaner saves energy by only using air-conditioning in the peak months of December and January. In shoulder times they use two large extraction exhaust fans which owner Kris Anderson says is a much more energy efficient way to cool the shop.

“They just need to be appropriately sized for the space – in our 80 square metre shop we have two two-foot extraction fans [around 0.6 metres] and we use one and then two depending on how hot it is,” said Kris. “The cost is negligible compared to the cost of running air-conditioning, so we save a lot.”<sup>17</sup>

<sup>15</sup> [EnergyCut.info/fan-savings](http://EnergyCut.info/fan-savings)

<sup>16</sup> [EnergyCut.info/carbon-trust-hvac](http://EnergyCut.info/carbon-trust-hvac)

<sup>17</sup> [EnergyCut.info/dry-cleaners-laundromats-case-study](http://EnergyCut.info/dry-cleaners-laundromats-case-study)

## Keep your windows, vents and doors shut when using air-conditioning

It really pays to keep the doors and windows shut when you're cooling or heating your building.

If you're using air-conditioning on a hot day and someone leaves the windows or doors open, it can significantly increase your cooling costs. All that expensive cold air is literally going out the door.

One simple way to guarantee that your doors stay shut is to put an automatic door closer on your outside doors. This reduces air conditioner costs and helps to improve security.

If you have lots of people continually coming in and out of your premises, here are just some of the available door options:

### Vinyl strip doors (also known as vinyl strip curtains/barriers)

Installing vinyl strip doors is one way to reduce this type of leakage.

They can be used in the front of shops, and entrances through to coolrooms, walk-in freezers and warehouse facilities.



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*An automatic door closer*

### High-speed insulating doors (also known as 'rapid roll doors')

High-speed insulating doors and low-speed insulating doors operate like insulated, motorised roll-up garage doors. These are very useful for temperature controlled warehouses and the like.

Although they're more expensive than strip doors, they can save you money on your heating and cooling bills.

If you have vehicles coming in and out of your building, high-speed insulating doors don't just save on heating and cooling costs – they improve productivity, as drivers are not held up by doors that open too slowly. Plus they also improve security.

18 Image courtesy of [EnergyCut.info/strongarmstore](http://EnergyCut.info/strongarmstore)





## PVC impact doors

Other door options include PVC impact doors. These are flexible doors that you can drive carts or forklifts directly at, and through.

Although these fixtures come in for a fair amount of abuse, they save money with heating and cooling bills by keeping the temperature more even in the area where they're situated.

## Save money by restricting the use of non-thermostat radiant heaters

Open fires and fireplaces warm people who are sitting directly in front of them. This is called radiant heat.

Electric radiant heaters operate on the same principle. They are useful when it comes to heating a person who is sitting in front of one, but they're not good when it comes to heating a whole room. If you use a radiant heater to heat a room, then you'll waste money as the running cost will quickly outweigh its purchase cost.



If you are using radiant heaters, you should try and restrict their usage to after-hours when you want to keep an employee warm, but you don't want to heat the whole room.

Radiant heaters are often cheap to buy but they can be expensive to run. Some of these heaters can use up to 2,400W of electricity, so if you are buying a radiant heater, it's best to buy one with multiple settings that are lower than this, eg 400W, 800W or 1,200W.

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*The lower the watt setting, the more money you'll save.*

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## How much can these heaters cost to use?

If your business is paying 25 cents per kWh, using a single heater for 20 hours a week could lead you to paying the following amounts:

WATTAGE OF HEATER UNIT	WEEKLY (20 hours)	MONTHLY	WINTER (3 months)
2,400W	\$12	\$52.00	\$156.00
1,800W	\$9	\$39.00	\$117.00
1,200W	\$6	\$26.00	\$78.00
800W	\$4	\$17.33	\$52.00
400W	\$2	\$8.67	\$26.00
75W (heat mat)	38c	\$1.64	\$4.92

If you have more than one of these radiant heaters in your business, the cost can really add up over the winter months.

When it comes to heating a room (and not just a single person), reverse-cycle air conditioners are more energy efficient.

As these units can both heat and cool, do remember to get a reverse-cycle air conditioner that has a high energy efficiency rating for both heating and cooling.

These units can be found at the Energy Rating website: [EnergyCut.info/aircon-ratings](http://EnergyCut.info/aircon-ratings)



## What to do if your heater or air conditioner doesn't have a thermostat?

Without an inbuilt thermostat, a stand-alone heater can easily overheat a room. Likewise, an old air conditioner without a thermostat can overcool the room. Both will increase your energy bills.

The solution is to buy a plug-in electronic thermostat called a HeaterMate. Costing only \$40 per unit, you plug a heater or air conditioner into this thermostat and then plug the thermostat into the wall socket.

When the room reaches the temperature you set on the HeaterMate, the unit automatically turns off the power to the heater or air-conditioning appliance.

This functionality enables the devices to pay for themselves in a short space of time. For more information visit [HeaterMate.com.au](http://HeaterMate.com.au).<sup>19</sup>



### Parap Veterinary Hospital, NT

Parap Vet Hospital was able to save more than \$400 per month by retiring their old 'dinosaur' air conditioner and replacing it with a more energy efficient model - ideal to battle the harsh conditions of a Darwin summer. Do you have an old air conditioner that you could replace?<sup>21</sup>



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<sup>19</sup> To watch a video of this device in action, visit [EnergyCut.info/heatermate](http://EnergyCut.info/heatermate)

<sup>20</sup> Image courtesy of Patrina Malone.

<sup>21</sup> [EnergyCut.info/vets-case-study](http://EnergyCut.info/vets-case-study)

## How floor mat heaters can save money

If you just want to heat one person, then you may want to get a floor mat heater. An energy efficient mat heater can use only 75W, so they are an efficient way of keeping an individual warm. They're also cheap to buy - expect to pay only \$50-\$75.

Although they're meant for your feet, they're far more effective if:

- you put them on your seat and sit on them, or
- you put them between you and the back of your chair.



They are useful for people who work after the main heating has been switched off after-hours, or for people who work alone. For more information visit: [EnergyCut.info/floor-mat-heater](https://www.energycut.info/floor-mat-heater)

### AIRAH Industry Directory online – the definitive HVAC resource

AIRAH is a specialist organisation which represents over 10,000 air-conditioning, refrigeration, heating and ventilation professionals across Australia.

If you need to find a brand stockist or anything to do with air-conditioning equipment, then you need to visit the AIRAH online Industry Directory.

The directory enables you to:

- find a company
- find a product or service
- find the supplier of a brand.

Their Industry Directory is a detailed resource for everything to do with air-conditioning and refrigeration. If you need air curtains, a heat pump, an access door, a heater or filter, then you'll find these and more at [EnergyCut.info/airah-industry](https://www.energycut.info/airah-industry). You can also check out their website at [airah.org.au](https://www.airah.org.au).





## Invest & save

### How to save money when upgrading your air-conditioning systems

If you're still using an old window-box air-conditioning unit or your air conditioner is more than 10 years old, then it's time to upgrade to an energy efficient split-system, or reverse-cycle inverter air conditioner.

Newer heating and cooling systems can be 20–40% more efficient than these older ones – even more if the old system has not been well maintained.<sup>22</sup> For many businesses, upgrading your air-conditioning can save you hundreds, if not thousands of dollars a year.

Before buying any air-conditioning equipment, it pays to get good independent advice. A good source is CHOICE at [EnergyCut.info/choice-reviews](https://www.energycut.info/choice-reviews).

When it comes to air-conditioning your business premises, here are the things that you need to consider.

- ▶ **When should you retire an air-conditioning system?**
- ▶ **Questions to ask before purchasing cooling equipment**
- ▶ **Look for the money-saving stars on air conditioners**
- ▶ **How 'natural refrigerant' air conditioners can reduce your running costs**
- ▶ **Air-conditioning economisers**
- ▶ **Installing sensors**
- ▶ **Are you eligible for a PeakSmart payment?**
- ▶ **Evaporative air cooler systems**
- ▶ **Do you need an energy management system?**

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***Before you buy a new air-conditioning unit, maximise your draught-proofing, shading and insulation.***

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<sup>22</sup> [EnergyCut.info/systems-efficiency](https://www.energycut.info/systems-efficiency)

## When should you retire an air-conditioning system?

Maintaining an old air-conditioning system may keep it working, but it won't lower your energy bills like an energy efficient replacement.

Given that it costs money to upgrade your air-con, you should replace your unit when it reaches the end of its economic life. According to the NSW OEH:

- a single-room air-conditioning unit (up to 10kW) has an economic life of 7-10 years
- a standalone packaged air-conditioning unit (10kW-100kW) has an economic life of 10-15 years.<sup>23</sup>

If your air conditioner is becoming inefficient or hard to maintain, you may need to replace it before this time. Your HVAC technician or EcoSmart Electrician can advise you on this.

There are 11 million split-system air-conditioning systems in Australia. Each year, 500,000 of them reach the end of their life.<sup>24</sup> Replacing your air-conditioning units with energy efficient alternatives represents an excellent opportunity to save money.

## Questions to ask before purchasing cooling equipment

Before you buy any cooling equipment, you first need to stop your business from getting hot in the first place. This can be achieved by:

- insulating and draught proofing your premises (see 'Step 10 - Get comfortable with insulation')
- shading and ventilating your business (see earlier in this chapter).

If you're thinking of buying cooling equipment, CHOICE recommends that you ask the following questions:



### **Q1: Are you uncomfortable for more than just a few days during summer?**

**No:** No action required.

**Yes:** If you've insulated, draught-proofed and shaded your premises, but it's still getting too hot, you may need a cooling appliance. Go to Question 2.

<sup>23</sup> EnergyCut.info/aged-care-tool-kit

<sup>24</sup> Cold Hard Facts 2, p.23, prepared by 'The Expert Group' on behalf of the DCCEE.

**Q2: How big is the area you want to cool?**

**Personal space or desk:** Consider a portable fan.

**Room/office:** Go to Question 3.

**Whole premises:** Go to Question 4.

**Q3: (Single room/office) What type of climate do you live in?**

**Dry:** Consider a portable or fixed room evaporative air cooler.

**Humid:** Consider a ceiling fan or a pedestal fan. If that doesn't suffice, consider:

- a portable air conditioner
- a wall based split-system refrigerative air conditioner.
- a window base air conditioner (see below).

**Q4: (Whole premises) What type of climate do you live in?**

**Dry:** Consider a ducted evaporative air cooler.

**Humid:** Consider a ducted refrigerative air conditioner.

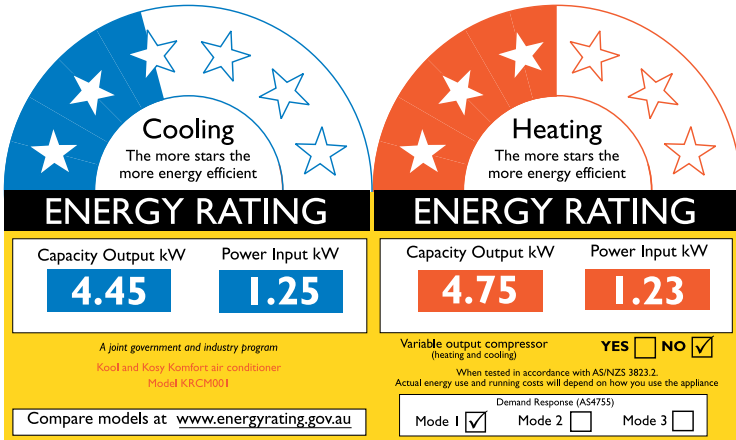
When choosing to install a window based air conditioner, bear in mind that it can block natural light. A wall based air conditioner will leave your windows unobstructed. One advantage of window based air conditioners, however, is that businesses who rent their premises can easily take them away at the end of their lease.<sup>25</sup>

**Window-based air conditioners versus split-system**

**Window based air conditioners are naturally less efficient than split-systems. This is because they are always cooling/heating air drawn from the outside of the building. They also introduce draughts into the building, so should only be used as a last resort. A split system heats/cool the air already inside the building so they are a better option.**

<sup>25</sup> Adapted with permission from CHOICE

## Look for the money-saving stars on air conditioners



Buying new energy efficient equipment eradicates the need to maintain old equipment that uses too much energy.

When purchasing new air conditioners, take notice of the energy-rating label. The more stars, the lower the heating and cooling bills.

- Every extra star on an air conditioner can reduce your running costs by up to 10%.<sup>26</sup>
- The star rating for air conditioners can go as high as 10 stars.
- If possible, buy a unit that has at least 4.5 stars.
- The blue stars show you how efficient the machine is at cooling. If an air conditioner has the same star rating, look at the number in the blue 'Power Input' box. The lower it is, the cheaper your cooling costs will be.
- If you have a reverse-cycle system, the red stars will show you how efficient the machine is at heating. After you've settled on the size of the unit that you need, look for the lowest possible number in the red 'Power Input' box.
- To compare the running costs of new air conditioners, go to the federal government's Energy Rating website: [EnergyCut.info/aircon-ratings](http://EnergyCut.info/aircon-ratings)

<sup>26</sup> Source: Sustainability Victoria 'Smarter Choice' leaflet





## How 'natural refrigerant' air conditioners can reduce your running costs

Refrigerants such as hydrocarbons, carbon dioxide and ammonia are called 'natural refrigerants' because they occur in nature. Used as cooling agents in air conditioners, hydrocarbon natural refrigerants are more energy efficient than traditional synthetic HFC refrigerants.

The fact they reduce energy bills is not the only reason why they're becoming more popular. Many countries are looking to phase out high GWP HFCs and many major companies are pledging to switch to natural refrigerants. Next time you're buying an air conditioner, look for a product that uses natural refrigerants or low GWP synthetic refrigerants.

## Air-conditioning economisers

People, computers, lighting, photocopiers and other machinery increase the internal temperature of buildings. At times, the temperature can increase to the point where the outside air is actually cooler.

At these times, an economiser brings the outdoor air into the building and does the cooling for you. Having an economiser on an air-conditioning unit can reduce its energy use by up to 15%.<sup>27</sup>

Talk to an EcoSmart Electrician or technical service provider about whether an economiser could work for your business. As some A/C systems provide conditioned outdoor air for ventilation and some do not, when you purchase a new air conditioner, also ask them how you can best integrate ventilation with the A/C unit.

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<sup>27</sup> [EnergyCut.info/3eproject-hvac](http://EnergyCut.info/3eproject-hvac)

## DoSomething, NSW

When the DoSomething charity moved to the Blue Mountains town of Katoomba, the winter chill made their new office extremely cold.

To keep their energy bills down, they decided to consider a Pioneer split-system reverse-cycle air conditioner because it was said to be very energy efficient. It uses state of the art electronics and engineering with a variable speed drive and the inverter required for heating and cooling reverse-cycle air-conditioning.

Prior to buying the split system, they had the supplier carry out a test on the system to compare alternative refrigerants. They tested the Pioneer system using R410a (a synthetic refrigerant) and compared it to the same equipment using a hydrocarbon refrigerant (also referred to as a 'natural refrigerant').

The test showed that the system on standard R410a refrigerant cost more to run than the same machine running on natural refrigerant. The running costs were 37% less when using the natural refrigerant. In addition, the Pioneer air-conditioning unit with natural refrigerant was comparable in price to a conventional split-system air conditioner.

When it comes to replacing your air-conditioning system, talk to your suppliers to see if they can provide you with a unit that uses energy efficient natural refrigerant.

For further information, watch: [EnergyCut.info/pioneerair](https://www.energycut.info/pioneerair) or visit [PioneerAir.com.au](https://www.pioneerair.com.au)<sup>28</sup>



<sup>28</sup> [EnergyCut.info/dosomething-research](https://www.energycut.info/dosomething-research)



## Installing sensors

Talk to your EcoSmart Electrician or technical service provider to see if sensors can be cost-effectively added to your air conditioning set-up:

- Some sensors or switches can automatically detect and turn off the air-conditioning when someone opens the doors or windows.
- An infrared occupancy sensor can turn off an air conditioner after it detects that nobody has been in the room for a set period of time. After going into energy-saving mode, it turns back on as soon as someone comes back into the room.
- Temperature sensors can turn an air conditioner on and off depending on what temperatures you have programmed into the unit.
- When you install CO<sub>2</sub> sensors and motorised dampers, you can match the number of people in your premises with the amount of outdoor air entering the building.<sup>29</sup> This is useful when you get significant variations in the numbers of people coming in and out of your facilities.

All of these sensor solutions reduce running costs and can help to maximise the energy efficiency of your HVAC set-up.

## Are you eligible for a PeakSmart payment?

If you're buying a new air conditioner, it's worth contacting your electricity company to see if they offer financial rebates for businesses that buy 'PeakSmart' enabled air conditioners.

A PeakSmart enabled air conditioner is able to receive a signal via the power lines from the energy company. This signal makes it use less electricity during times of peak energy demand.

When the energy company triggers the PeakSmart capability in the air conditioner, it still cools the premises, but to a lesser degree. Using less power in this way helps to reduce the stress on the power grid and also reduces peak demand energy bills.

<sup>29</sup> [EnergyCut.info/ardent-leisure](http://EnergyCut.info/ardent-leisure)

**PeakSmart air-conditioning**  
The simple, comfortable choice

Buy a PeakSmart air conditioner for your home or business and be rewarded\*

**POSITIVE PAYBACK**  
A REAL DEAL FOR REDUCING YOUR PEAK DEMAND ENERGY BILLS

\*terms and conditions apply

*The PeakSmart leaflet*

At the moment, not all energy companies are offering PeakSmart incentives. However, in Queensland, the energy company Energex is currently paying the following one-off amounts when you buy PeakSmart enabled equipment and sign up to the scheme:

Cooling capacity	Reward available
Less than 4kW	\$100
4kW but less than 10kW	\$200
10kW or more	\$400

Businesses in this Queensland scheme can currently claim up to five PeakSmart rewards per premises for any type of PeakSmart enabled air-conditioning system. Many major air-conditioning brands are now PeakSmart eligible, so if your energy company offers these rewards, you'll have plenty of choice.

To check out the list of PeakSmart eligible air conditioners, visit [EnergyCut.info/peak-smart-aircon](https://EnergyCut.info/peak-smart-aircon)

For more information on the Energex PeakSmart scheme, visit their website at [EnergyCut.info/peak-smart](https://EnergyCut.info/peak-smart) or watch the video at [EnergyCut.info/peaksmart-video](https://EnergyCut.info/peaksmart-video).

## Evaporative air cooler systems

If your business is based in a drier and less humid part of Australia, you may want to check out evaporative cooling systems as these use up to 75% less energy than normal refrigerative air conditioners.<sup>30</sup>

Evaporative coolers pull in hot air through wet filter pads that are kept that way by the water tank in the base of the unit. The water from the wet pads evaporates, chilling the air, which is then blown out into the workspace. According to Sustainability Victoria:

- portable units cost 2 to 3 cents per hour
- window/wall-mounted units cost 6 to 7 cents per hour
- ducted units (medium size) cost 12 to 28 cents per hour.<sup>31</sup>



<sup>30</sup> [EnergyCut.info/eme-options](https://EnergyCut.info/eme-options)

<sup>31</sup> Source: Sustainability Victoria - [EnergyCut.info/evaporative-coolers](https://EnergyCut.info/evaporative-coolers)



With this type of cooling unit, you need to keep some windows and doors open in the rooms that are being cooled. Not having them open reduces the performance and efficiency of the unit.

For more info on evaporative coolers, visit [EnergyCut.info/evaporative-coolers](https://EnergyCut.info/evaporative-coolers)

### **The Good Loaf, VIC**

At the Good Loaf Bakery, an energy efficient evaporative cooler has been chosen over a split-system air conditioner. Sun-screening blinds fitted to the north-eastern side of the building, keep the heat out on hot days and reduce the demands on the air conditioner.<sup>32</sup>

## **Do you need an energy management system?**

If your air-conditioning set-up uses a lot of power, then you may need to install an energy management system (EMS).

According to Ausgrid, when it comes to large complex systems, an EMS has the potential to reduce air-conditioning costs by a quarter.<sup>33</sup>

### **The Doomadgee Store, QLD**

An energy audit at the Doomadgee Store identified opportunities to improve energy efficiency, especially in relation to air-conditioning and refrigeration which accounted for 75% of their total annual electricity consumption. They reduced running costs by 35% by installing a new control system to regulate the air-conditioning system.<sup>34</sup>

<sup>32</sup> [EnergyCut.info/the-good-loaf](https://EnergyCut.info/the-good-loaf)

<sup>33</sup> [EnergyCut.info/ausgrid-report](https://EnergyCut.info/ausgrid-report)

<sup>34</sup> [EnergyCut.info/doomadgee-store](https://EnergyCut.info/doomadgee-store)

## Assessing running costs when buying cooling systems

When making a decision about the type of system that you want to install, it's good to know the approximate running costs of the cooling system that you're going to use.

To get a definitive figure on the cooling costs for air conditioners, use the cost calculator at [EnergyCut.info/aircon-ratings](https://EnergyCut.info/aircon-ratings)

Meanwhile, here are Sustainability Victoria's approximate costs for keeping cool.<sup>35</sup>

Room size	Suitable cooler type	Energy star rating	Annual Energy cost*
Small room 10m <sup>2</sup>	Electric split system air conditioner 2.5 kW output	★ ★ ↘	\$34.00
		★ ★ ★ ★ ★	\$27.00
	Portable or ceiling fan	N/A	\$4.00 to \$6.00
Medium room 35m <sup>2</sup>	Electric split system air conditioner 5.5 kW output	★ ↘	\$86.00
		★ ★ ★	\$74.00
	Portable or ceiling fan	N/A	\$4.00 to \$6.00
Large area 60m <sup>2</sup>	Electric split system air conditioner 8 kW output	★ ↘	\$125.00
		★ ★ ★	\$108.00
	2 portable or ceiling fans	N/A	\$9.00 to \$12.00
Small business premises (equivalent in size to a home) 166m <sup>2</sup>	Ducted air conditioning 20 kW (not zoned)	Standard efficiency	\$383.00
		High efficiency	\$349.00
	Ducted air conditioning 20 kW (zoned)	Standard efficiency	\$287.00
		High efficiency	\$262.00
	Evaporative cooling 16 kW	Standard	\$54.00
		Inverter	\$37.00
4 portable or ceiling fans	N/A	\$19.00 to \$24.00	

<sup>35</sup> [EnergyCut.info/cooling-costs](https://EnergyCut.info/cooling-costs). Approximate cost per annum, based on 300 hours usage and a 60% duty cycle for air conditioners. Based on electricity tariff of 28c/kWh.



## **‘Inverter’ air conditioners and variable speed drives – why they’re more energy efficient**

Traditional air conditioners have one fixed speed and when the room reaches a certain temperature, they stop the compressor.

That’s not as energy efficient as it could be as the compressor is constantly stopping and starting to keep the room temperature at the set level.

An ‘inverter-type’ air conditioner, however, has a variable speed drive. This means that the inverter air conditioner can adjust the speed of the compressor motor up or down to match the temperature change that’s needed.

The impact that this has on the unit makes it far more energy efficient and it keeps the room temperature more constant.

This ability to reduce the fan speed in ducted HVAC systems by 20% can also reduce energy consumption by up to nearly 50%.<sup>36</sup> So it’s worth looking at your options with this equipment when upgrading.

If you want professional advice on inverter-type air conditioners versus conventional air conditioners, talk to an EcoSmart Electrician or a technical service provider with HVAC experience.

### **Want more information?**

The variable output compressor column in the government’s E3 energy rating guide will tell you which air conditioners have these variable output compressors:

[EnergyCut.info/aircon-ratings](https://www.energycut.info/aircon-ratings)



<sup>36</sup> EnergyCut.info/air-dist-systems p.16, prepared by Energy Star

## How to save money when upgrading your heating systems

Many businesses waste money by using heaters when all they need to do is improve their insulation, eliminate draughts, use ceiling fans, and better utilise the warmth of the sun.

If you've done this but still need additional warmth, then you need to assess whether or not everywhere in your business requires heating, or just a small part of it, such as a meeting room or office. It's always more cost-efficient to heat the smallest area possible.

The following section has adapted heating advice from the SA.gov.au website.<sup>37</sup> Take this information into consideration when you're assessing your heating set-up:

- ▶ **Look for the money-saving stars on gas heating systems**
- ▶ **How to cost-effectively heat a person or a small room**
- ▶ **Heating a large room or open-plan area**
- ▶ **Heating the whole premises**

**Many businesses waste money by using heaters when all they need to do is improve their insulation, eliminate draughts, use ceiling fans, and better utilise the warmth of the sun.**



<sup>37</sup> [EnergyCut.info/efficient-heating](https://www.energycut.info/efficient-heating)



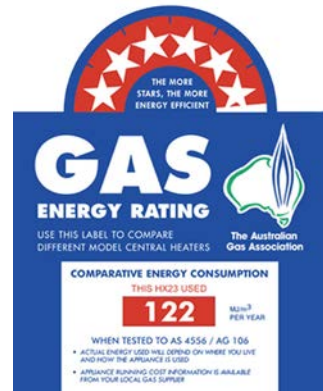


## Look for the money-saving stars on gas heating systems

Electrical goods are not the only appliances with energy-rating stars. Gas heating systems such as ducted heating and gas space heaters have them too (they're also on gas water heaters).

Gas labels give you a star rating for energy efficiency – they also give you the annual energy consumption of the product with a MJ (megajoules) per year figure.

Look out for gas heating appliances that have a maximum number of energy-rating stars and the lowest MJ figure.



Each extra star on a gas heater will save you around 10% on running costs. If your business is investing in a gas space heater or a ducted gas heating system, make sure that it has a minimum 4-star rating.<sup>38</sup> Super-efficient systems are now available that have a 6-star rating.<sup>39</sup>

If you are buying a ducted gas heating system, you can maximise the cost efficiency of the system by insulating the ducts.

### Further advice on gas heating

You can also download a gas heater advice leaflet from Sustainability Victoria here:

[EnergyCut.info/heating-flyer](https://EnergyCut.info/heating-flyer)

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***Each extra star on a gas heater will save you around 10% on running costs.<sup>40</sup> Look out for gas heating appliances that have a maximum number of energy-rating stars and the lowest MJ figure.***

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<sup>38</sup> [EnergyCut.info/heating-flyer](https://EnergyCut.info/heating-flyer)

<sup>39</sup> [EnergyCut.info/six-star-heating](https://EnergyCut.info/six-star-heating)

<sup>40</sup> [EnergyCut.info/heating-flyer](https://EnergyCut.info/heating-flyer)

## How to cost-effectively heat a person or a small room

When it comes to heating a person or a small room, these are the options available to your business:

- **Portable electric radiant heater.** These are good for directly heating people after-hours but if you use them to heat the room, you can waste a great deal of money.
- **Fan-forced portable electric convection heater.** These can heat a room but not if it has high ceilings. Buying a model with a thermostat will save you money on running costs.<sup>41</sup>
- **Oil-filled column heaters.** These can be used for slightly larger rooms with higher ceilings. Buying a model with a thermostat will save you money on running costs.

## Heating a large room or open-plan area

When it comes to heating a large room or open-plan area, these are the options available to your business:

- **Reverse-cycle air conditioner.** When it comes to heating a room – and not just a single person – a reverse-cycle air conditioner is more energy efficient than the options above. One of the other advantages of a reverse-cycle unit is that it provides cooling as well as heating. But when purchasing one, make sure you buy a unit that has the most energy-rating stars – this is a guaranteed way to reduce your running costs. Buying one with natural refrigerant will be more energy efficient too.
- **Off-peak electric storage heater (also known as 'heat banks').** Storage heaters use cheap off-peak energy at night to heat up a special heat-retaining material (usually bricks). It then releases this heat during the day.<sup>42</sup> This is a very economical way of heating a room. However, you may need an additional heater for the evening if the stored heat has run low.<sup>43</sup>

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41 [EnergyCut.info/yh-heat-cool](http://EnergyCut.info/yh-heat-cool)

42 [EnergyCut.info/choice-heating-advice](http://EnergyCut.info/choice-heating-advice) - this page gives advice on heating options that can be applied to small business premises.

43 [EnergyCut.info/offpeak-storage](http://EnergyCut.info/offpeak-storage)



- **Flued or unflued natural gas heater.** Flueless gas heaters require ventilation, so bear this in mind if you're choosing this option. Also check if there are restrictions in your area on using flueless gas heaters.

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*Hot air rises, so you should aim your heater's louvres towards the floor. This will maximise the area affected by the heat.*

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## Heating the whole premises

When it comes to heating your whole premises, these are the options available to your business:

- **Zoned ducted reverse-cycle air conditioner.** Zoning your central heating means that you can heat specific areas of your business and not just the whole premises. This will save you money. To maximise energy efficiency, make sure that this type of system is custom-designed specially for your building.
- **Ducted central gas heating.** With ducted central heating, gas is currently the best option. If you're purchasing this system, take into account gas price increases when assessing lifetime running costs. If gas is not available, you can use electricity too.

## Further information on heating systems

The YourHome.gov.au website has a good PDF booklet about heating. Although focussed on home heating, much of the information is relevant for small businesses:

[EnergyCut.info/yh-heat-cool](https://www.energy.gov.au/yh-heat-cool)

Sustainability Victoria has a very useful table that gives approximate annual running costs for a range of different heating options. You can check it out at [EnergyCut.info/heating-costs](https://www.energy.gov.au/heating-costs). They also have a useful guide to choosing heaters at [EnergyCut.info/choosing-heaters](https://www.energy.gov.au/choosing-heaters).

## Can your business use heat recovery?

Many companies are now collecting and reusing the wasted heat that's generated by their operations.

Some are using it to heat their premises, while others are using it to heat water, generate power or preheat combustion air for ovens, boilers and furnaces. This recovered heat can be used in a range of industrial processes.<sup>44</sup>

Regardless of how these companies reuse this wasted heat, the outcome is the same. It reduces energy consumption and makes the company more energy efficient.

### Heat recovery ventilation

If your business has a lot of heat-generating processes, you may want to consider using a heat recovery ventilation system.

A heat recovery ventilation system takes the cold air from outside, drawing it in through a heat exchanger. The heat exchanger captures the heat from warm, outgoing, stale air to pre-heat the incoming outdoor air.

In colder climates, these units help to retain heat inside a building. They can also reduce the heat load on cooling systems in warmer climates.

The process is so efficient that it can recover up to 80% of the heat from the outgoing air.<sup>45</sup> If you need to regularly change over the air in your business, then this is a highly efficient way to do so.

Companies who distribute or install heat recovery ventilation systems can advise you on the payback and cost-saving potential of these units.

### Heat Shifters

Heat shifters are basically a duct with a fan that transfers warm air from a heated room to another unheated part of your business. They're inexpensive to install and operate and can transfer heat to another area up to 12 metres away.<sup>46</sup>

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<sup>44</sup> [EnergyCut.info/heat-recovery-guide](https://EnergyCut.info/heat-recovery-guide)

<sup>45</sup> [EnergyCut.info/heat-recovery-guide](https://EnergyCut.info/heat-recovery-guide)

<sup>46</sup> [EnergyCut.info/heat-shifters](https://EnergyCut.info/heat-shifters)



They can take heat from an upstairs part of your premises and bring it back downstairs. They can also take excess heat and place it in areas that don't require constant heating (such as toilets).

When installing a heat shifter, a qualified electrician needs to be used to install the fan.

### Eastern Road Quality Meats, NSW

Strategic use of ventilation is helping Eastern Road Quality Meats to achieve energy savings of around 25% by reducing the need for air-conditioning. A simple extraction exhaust fan on the back wall and ventilation located behind the fridges and cool rooms removes warm air from the shop.

“These don't cost much to run but it means that six other motors, on the fridges and the air-conditioning, don't have to work so hard, resulting in a very significant impact on energy consumption,” said owner Allan Waldon.<sup>47</sup>

## Heat recovery checklist

If you want to assess the potential for heat recovery in your business, there is a checklist that you can utilise: [EnergyCut.info/heat-recovery-ct](https://EnergyCut.info/heat-recovery-ct)

Further information on heat recovery: [EnergyCut.info/info-heat-recovery](https://EnergyCut.info/info-heat-recovery)

### Heather Brae Shortbreads, VIC

At Heather Brae Shortbreads, the baking and packaging area was designed so that the heat from the ovens is recovered and used to keep the work area warm, eliminating the need to heat this area. This, and other measures, are saving around 10–15% on their annual energy bills.<sup>48</sup>

<sup>47</sup> Source: DoSomething, Better Business Partnership: [EnergyCut.info/butcheries-case-study](https://EnergyCut.info/butcheries-case-study)

<sup>48</sup> [EnergyCut.info/heather-brae-shortbreads](https://EnergyCut.info/heather-brae-shortbreads)

## Save money by zoning your ducted HVAC

With a properly-designed ducted HVAC system, you can have ducts delivering air-conditioning in different rooms across your premises, all controlled by a single panel. These systems can be zoned, giving you the option to heat or cool one area and not another.

When it comes to implementing this type of system, you need to be aware of the following:

- Make sure your zoning is implemented correctly, otherwise you can end up with some areas being too hot and others too cold. Getting this wrong will lead to bigger energy bills.
- When setting up your HVAC zoning for the first time, it pays to get advice from a company with experience in installing ducted HVAC systems.
- The air from your heating and cooling system travels through the ducting system before it reaches you. So make sure you use high insulation ducting that has an R value of at least 1.5 / 2.0.
- These systems can have timers that turn off the heating or cooling when it's not needed at night or over the weekend.
- Some air-conditioning systems enable you to add additional ducts. One system allows you to add eight zones from the one unit.<sup>49</sup> When you're buying a new air-conditioning system, this flexibility should be taken into consideration if your business is going to grow and take on new staff.
- Some multi-split systems also give flexibility for a growing small business. With these systems, one outdoor unit can power up to four indoor units at the same time, but remain energy efficient just powering one indoor unit.<sup>50</sup>
- You can program the thermostats to turn on the heating or cooling at a set time before people come to work.



<sup>49</sup> [EnergyCut.info/zone-control](https://www.energycut.info/zone-control)

<sup>50</sup> [EnergyCut.info/air-con-multi](https://www.energycut.info/air-con-multi)



- When it comes to heating and cooling, you should try to reduce airflow and avoid undersized ducts.
- You should install a system that allows you to shut off the ducts in rooms that don't need heating or cooling. When it comes to this option, you should consult your HVAC technical service provider or EcoSmart Electrician.

**When buying a ducted reverse-cycle air-conditioning set-up for your business, make sure your supplier designs it to minimise energy use.**

## Further information on the energy efficient operation of HVAC systems

Maintaining and operating HVAC systems at their peak efficiency will save you money. The Department of Industry and Science has a best practice guide for operators and users of non-residential HVAC systems.

'Guide to Best Practice Maintenance & Operation of HVAC Systems for Energy Efficiency': [EnergyCut.info/hvac-best-practice-guide](https://EnergyCut.info/hvac-best-practice-guide)

### Spot cooler information

Also known as 'Portable Air Conditioners', efforts are being made by the government to reduce the amount of energy that these units use: [EnergyCut.info/spot-coolers](https://EnergyCut.info/spot-coolers)









## STEP 10

# Get comfortable with insulation

**When you mention insulation, most people think of batts in the roof. But it's more than that.**

It involves anything that:

- keeps the heat in during winter
- keeps excessive heat out during summer.

Without insulation, a significant amount of the energy that we use to heat or cool our business premises can be lost.

By properly insulating and draught-proofing your premises, you can reduce your heating and cooling bills by up to 40%.<sup>1</sup>

In addition to reducing costs, insulation can also make your working environment more comfortable.

This section will show you how insulation, draught-proofing and energy efficient windows can help to cut your running costs.

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***Insulation and draught-proofing can reduce winter heating costs by up to 70%.<sup>2</sup>***

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<sup>1</sup> [EnergyCut.info/wall-insulation](https://www.energycut.info/wall-insulation)

<sup>2</sup> [EnergyCut.info/insulation-draught](https://www.energycut.info/insulation-draught)



# Did you know?

## Step 10: Insulation

By properly insulating and draught-proofing your premises, you can reduce your heating and cooling bills by up to 40%.

See page 203

During winter, draughts can be responsible for up to 25% of heat loss from your business. Australian buildings leak 2-4 times as much air as North American or European buildings

See page 213

Insulation and draught-proofing can reduce winter heating costs by up to 70%.

See page 203

Bulk insulation is like a big quilt in your ceiling and walls. In summer it stops the hot air outside from getting in, and in winter it stops the heat inside your building from getting out.

See page 210



See page 216

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&



Insulate 'like a thermos'  
in **WINTER**

Insulate 'like an esky'  
in **SUMMER**

See page 209

Painting a roof white or a pale colour, maximises the solar reflectance of a roof – this reduces the amount of heat that is transferred to the building below.

See page 226

In summer, a lack of shade around an insulated building can lead to what is called 'the oven effect'. After the sun's radiant heat passes through the glass and into the building, the heat inside the building increases. This can lead to a spike in your cooling costs.

See page 217

A business can lose up to 40% of its heat through windows, leading to an increase in heating costs. It can also gain up to 87% of its heat through windows, leading to an increase in cooling costs.

See page 234



See page 219



See page 224



# In this step

## Insulation – the basics

- ▶ How much money can you save with insulation?
- ▶ What types of insulation are there?
- ▶ What's the difference between 'R-values' and 'U-values'?
- ▶ Insulation and safety

## Low-cost solutions

- ▶ Draught-proofing your business
- ▶ Saving money with exhaust fans and vents
- ▶ How shading your premises can save you money
- ▶ Cutting drafts with a chimney balloon

## Invest & Save

- ▶ What should you ask an insulation installer?
- ▶ Use the right insulation levels for your area
- ▶ Keeping your roof spaces cooler
- ▶ The benefits of a cool roof
- ▶ Insulating underneath flooring and signs
- ▶ Garage door insulation
- ▶ Air curtains, revolving doors and automated doors

## **Insulation and windows**

- ▶ **How home-based businesses can save money with the 'Windows Energy Rating Scheme' (WERS)**
- ▶ **What should you look for when buying windows for commercial premises?**

## **Further information**

- ▶ **Ceiling insulation and halogen downlights**
- ▶ **Further information on insulation**

# Insulation – the basics

## How much money can you save with insulation?

Many SMEs do not have adequate insulation in their premises. With 69% of Australian homes now insulated,<sup>3</sup> the financial savings are well documented:

- Ceiling/roof insulation – savings of up to 45%.<sup>4</sup>
- Floor insulation – savings of up to 5%-10%.<sup>5</sup>
- Wall insulation – savings of up to 20%.<sup>6</sup>
- Hot water storage tanks and pipe insulation – savings of up to 30%.<sup>7</sup>
- Duct insulation – saves money by minimising heat leakage.
- Shading the outside of a building – can block up to 90% of the sun's heat.<sup>8</sup>
- In winter, up to 40% of heat can leak out through windows.<sup>9</sup> Using double glazing or 'low E' glass and window film can reduce this problem.
- During winter, draughts can be responsible for up to 25% of heat loss from your business.<sup>10</sup>

### Tudor House, NSW

By installing insulation in their walls and ceiling, the Tudor House motel in Glenn Innes saved \$476 a year on power bills. The insulation reduced air-conditioning use and brought about a 7% a year reduction in their power bills.

The savings were not just financial. Temperatures in Glenn Innes reach over 40°C in summer, but the new insulation made the hotel more comfortable to be in.<sup>11</sup>

3 [EnergyCut.info/abs-energy-use](http://EnergyCut.info/abs-energy-use)

4 [EnergyCut.info/insulation-installation](http://EnergyCut.info/insulation-installation)

5 [EnergyCut.info/floor-insulation-install](http://EnergyCut.info/floor-insulation-install)

6 [EnergyCut.info/wall-insulation-install](http://EnergyCut.info/wall-insulation-install)

7 [EnergyCut.info/yh-hot-water-service](http://EnergyCut.info/yh-hot-water-service)

8 [EnergyCut.info/yh-shading](http://EnergyCut.info/yh-shading)

9 [EnergyCut.info/window-heat-leak](http://EnergyCut.info/window-heat-leak)

10 [EnergyCut.info/ivdp-home](http://EnergyCut.info/ivdp-home)

11 [EnergyCut.info/tudor-house](http://EnergyCut.info/tudor-house)



### Why energy efficient windows are so important

During winter, a home-based business can lose up to 40% of heat through its windows leading to an increase in heating costs.<sup>12</sup>

In summer, windows can allow a lot of heat into the building, leading to an increase in cooling costs.

## What types of insulation are there?

There are two main types of insulation – bulk insulation and reflective insulation. You may also have heard of a third type – composite insulation. This combines the benefits and properties of both bulk and reflective insulation.

All of them will save you money. This section explains the difference between them.

An Australian government table that sets out the properties, uses and benefits of the above insulation types can be found at this site: [EnergyCut.info/yh-insulation-info](https://www.energycut.info/yh-insulation-info)

13

WARM INSIDE

Insulate 'like a thermos'  
in **WINTER**

&

COOL INSIDE

Insulate 'like an esky'  
in **SUMMER**

<sup>12</sup> [EnergyCut.info/window-heat-leak](https://www.energycut.info/window-heat-leak)

<sup>13</sup> Thermos and esky image from Sustainability Victoria

## Bulk insulation

Bulk insulation is like a big quilt in your ceiling and walls. In summer it stops the hot air outside from getting in, and in winter it stops the heat inside your building from getting out. This type of insulation includes:

- glasswool
- wool and rockwool batts
- rockwool
- polyester
- wool and cellulose fibre loose-fill
- extruded polystyrene (styrofoam)
- expanded polystyrene (EPS).



## Reflective insulation

Reflective insulation such as reflective foil can reflect up to 95% of outside radiant heat.<sup>14</sup> This type of insulation includes:

- reflective foil
- multi-cell foil batts
- concertina-type foil batts.



### The Manningham Centre, VIC

To cope with the need for more office space, the Manningham Centre purchased a customised, modular energy efficient building.

Features of the building include double-glazed windows and external doors, high thermally-rated ceiling (R3.5 glasswool batts) and wall (R2.5 rockwool soundcheck batts) insulation and EnviroSeal Wall Wrap to external walls. This insulation saves on future heating and cooling costs.<sup>15</sup>

<sup>14</sup> EnergyCut.info/lsqld-insulation

<sup>15</sup> EnergyCut.info/dosomething-research





## Composite insulation

Composite insulation combines the benefits and properties of both bulk and reflective insulation.

This type of insulation is used for foil-backed batts, foil-faced boards and foil-faced blankets.



## What's the difference between 'R-values' and 'U-values'?

'R-values' and 'U-values' are measurements used to judge the effectiveness of different types of insulation. They are the insulation equivalent of the energy stars on washing machines and fridges.

The R value measures the ability of your insulation material to resist the flow of heat.

The 'U-value' helps you to judge the effectiveness of window insulation. It's the measure of how much heat can be transferred through the window.

When it comes to installing insulation or windows:

- with insulation go for the highest 'R' rating
- with windows go for the lowest 'U' rating.

If in doubt, consult your local insulation and window expert.



*Look for the 'R' rating when buying insulation*

# Insulation and safety

Many small business owners are concerned about the safety risks of installing insulation, particularly with regard to reflective foils and the risk of electrocution.

According to the Australian Government,<sup>16</sup> your installer should:

- ensure that thermal insulation in roof spaces is clear of electrical fittings
- follow Australian New Zealand Standard AS/NZS 3000:2007 Electrical Wiring Rules which provide guidance on the separation of electrical equipment and insulation materials. Electricians and insulation installers working in the roof space of your house must follow these guidelines.
- ensure that they minimise fire risk. Installers should install all bulk insulation in compliance with Australian insulation installation standard AS 3999. The installer should follow a strict set of guidelines to keep insulation away from heat sources such as halogen downlights or hot flues.
- ensure that an installer certificate is issued.

## How to get insulation installed safely

**Given the media coverage in recent years about insulation safety, how do you ensure that it's installed safely?**

**Dangers including electric shock, fall hazards and toxic dust can be avoided by making sure that any insulation is installed in accordance with the Building Code of Australia and the relevant Australian standards.**

**If you are considering putting in foil insulation, the Australian Government advises that: "Reflective foil insulation should not be placed on top of ceilings or ceiling joists, nor under floors, as it is electrically conductive. Any such insulation must also be secured with non-conductive staples."**

**To find out how to find one in your state, visit [EnergyCut.info/licensed-insulation](https://www.energycut.info/licensed-insulation). When you go to hire someone, read 'What should you ask an insulation installer?' later in this chapter.**

<sup>16</sup> [EnergyCut.info/safety-insulation](https://www.energycut.info/safety-insulation)



## Low-cost solutions

### Draught-proofing your business

During winter, draughts can be responsible for up to 25% of heat loss from your business<sup>17</sup>. It's a bigger problem than many business people realise. [YourHome.gov.au](http://YourHome.gov.au) states that Australian buildings leak 2-4 times as much air as North American or European buildings.

Draught-proofing your business is a cheap way to save on your winter heating bills and your summer cooling costs.

### Finding the gaps and draughts in your building

You can spot draughts by dampening your hand and moving it over the following:

- gaps around windows
- gaps around doors
- gaps between ceilings, cornices and architraves
- gaps near skirting boards
- gaps between walls and floors
- gaps in flooring or floorboards
- gaps where HVAC equipment or piping enters your building
- gaps around commercial acoustic ceiling systems
- gaps in vented skylights and cooling outlets
- gaps around vented or recessed downlights.

It may be worth hiring a thermal imaging camera. This will allow you to see exactly where the heat is escaping.



*Thermal imaging camera*

<sup>17</sup> [EnergyCut.info/ivdp-home](http://EnergyCut.info/ivdp-home)

## How to reduce or fix draught problems

Here are the simple ways to fix or reduce draughts:

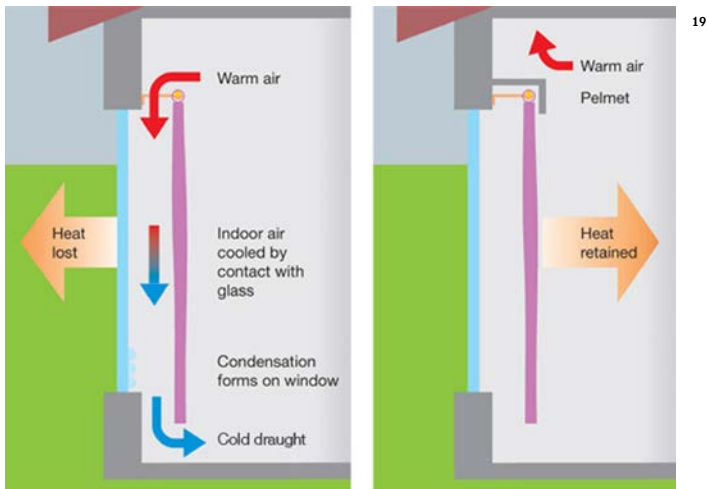
1) **Attach double-sided draught excluders or door seals to the base of your doors.**

Easy to install and far more effective than a 'door snake', these are available at your local hardware store.



2) **Use window blinds or well-fitted thermally-backed curtains with a pelmet above them.**

This traps the air between the curtains and the window, helping to reduce your heating and cooling bills. In summer, as the window heats up, it also heats the air between the curtain and the window. The pelmet stops this hot air from rising and getting into your premises. In winter, the curtains and pelmet combine to keep the warm air inside.<sup>18</sup>



<sup>18</sup> [EnergyCut.info/pelmets](http://EnergyCut.info/pelmets)

<sup>19</sup> Image source: [Coolgreen.com.au](http://Coolgreen.com.au)



### 3) Seal gaps and cracks with filler and caulk.

Expanding foam is good for large hollow gaps. Gap fillers and caulk are good for filling in the gaps between two surfaces such as a wall and a cornice, or a wall and a skirting board. Caulk is also useful for filling in small gaps around windows and door frames. There are a variety of available types of filler and caulk – your local hardware store can give you advice on the best solutions for your needs.<sup>20</sup>



### 4) Fit weather sealing strips to windows and doors.

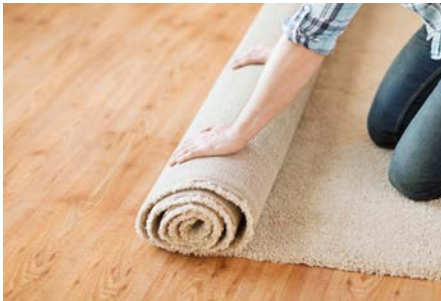
Weather strips are self-adhesive polyester strips and come in a range of thicknesses. Installing them is as simple as peeling off the adhesive strip and sticking the strips to the frames of your windows and doors.



They are a cost-effective way to block the small draughts that come in via your windows and doors.

If you're not sure what to do, use your phone to take a photo of your doors and windows and show it to a salesperson at the hardware store – they'll advise you on the kind of weather stripping that you need.

### 5) Put rugs on wooden floorboards



**If you want to 'do it yourself' when draught-proofing your business, your local hardware store will stock a range of products and can give you good advice.**

<sup>20</sup> [EnergyCut.info/gap-filler](https://www.energycut.info/gap-filler) & [EnergyCut.info/caulking-guide](https://www.energycut.info/caulking-guide)

## Saving money with exhaust fans and vents

When an exhaust fan or vent is not in use, it should snap shut. If it doesn't, hot or cold air can move in and out of the business. This can lead to heat loss or heat gain which can impact on heating and cooling bills.

If your exhaust fan doesn't automatically shut itself, an EcoSmart Electrician or insulation expert can install a self-closing damper or filter on it. This will stop air escaping or entering when it's not in use.

**Ask a qualified electrician or insulation expert to reduce unwanted airflow via your fans and vents**

### Using a DraftStoppa with a ceiling exhaust fan

One Australian SME has invented the DraftStoppa®. It's an innovative and inexpensive self-seal cover for ceiling exhaust fans that you can install yourself.

It has a set of balanced shutters which open when the fan is turned on – these then close under their own weight when the fan is turned off. It's an Australian-designed and manufactured product that stops hot or cold air from entering business premises via the ceiling exhaust fan.



The DraftStoppa is simple to install, requires little maintenance and can be retrofitted into established premises. According to the company that makes it, the benefits of the DraftStoppa® include:

- prevention of polluted air or cooking smells from entering into other parts of the home or workplace
- it also fits most standard 3-in-1-type ceiling exhaust fans
- it's simple to install and opens and closes effortlessly without loading-up your ceiling exhaust fan motor.

Where possible, installing venting (with dampers) to the outside of a business is recommended. Prolonged venting of moisture into the ceiling space can cause mould build up and damage to building structure. For more information: [EnergyCut.info/draftstoppa](https://www.energycut.info/draftstoppa)



## How shading your premises can save you money



*A retractable awning helps to reduce heat gain from the sun.*

### Avoiding ‘the oven effect’

Insulation needs to be coupled with shading and draught-proofing.

In summer, a lack of shade around an insulated building can lead to what is called ‘the oven effect’. After the sun’s radiant heat passes through the glass and into the building, the heat inside the building increases. This can lead to a spike in your cooling costs.

The easiest way to prevent this problem is to have external shading such as eaves, shutters, shade cloths or retractable awnings. These solutions offer a quick way to reduce heat gain from the sun.

The shade cover should be placed on the side of your building that is most exposed to the hot summer sun – typically, the north- and west-facing walls.

Shading your outside air-conditioning unit will also ensure that it operates more efficiently and cost-effectively.

### Alice Springs Helicopters, NT

An audit at Alice Springs Helicopters recommended the installation of shade by the east and west walls of their building. Doing this reduces air-conditioning costs as shade can reduce summer heat load on a building.<sup>21</sup>

<sup>21</sup> [EnergyCut.info/alice-springs-heli](http://EnergyCut.info/alice-springs-heli)

## Shade Planting

A long-term but effective way to shade your building is to also plant trees and shrubs outside your premises. Speak to your local nursery about the best kinds of plants to choose.

If your business is based in a hot humid climate (and some hot dry climates), it pays to plant evergreen trees. For all other climates (particularly cold climates), you should plant north-facing deciduous trees and vines.

This leaf-cover will help to minimise the heat impact from the summer sun. This can reduce cooling costs as the greenery shades the glass from unprotected heat gain.

When their leaves drop in winter, the bare branches let in the warmth of the winter sun. This can help to reduce heating costs.

Deciduous and evergreen trees can also be planted to the east and west of your building. Where relevant, you can also use shrubs to shade your windows.

## More information

[YourHome.gov.au](http://YourHome.gov.au) has an excellent fact sheet that shows how shading stops heat build-up and reduces heating and cooling costs. It also has more detail on where to plant trees and shrubs.

Although written for homes, the information is equally relevant for business premises: [EnergyCut.info/yh-shading](http://EnergyCut.info/yh-shading)

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***Direct sun can generate the same heat as a single bar radiator over each square metre of a surface; but effective shading can block up to 90% of this heat.<sup>22</sup>***

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<sup>22</sup> [EnergyCut.info/yh-shading](http://EnergyCut.info/yh-shading)





## Cutting drafts with a chimney balloon

If your business is located in an older building, there's a good chance that you'll have a chimney. Chimneys don't just bring drafts into a building, they also suck out a lot of the air that's been heated or cooled by your air conditioner.

The cheap and easy way to reduce this problem is to buy a chimney balloon. You place it inside your chimney and blow it up. If you want to use the fireplace, you simply deflate it for reuse later.

Depending on the size of your chimney, they will cost you \$44-\$55 from [www.chimneyballoons.com.au](http://www.chimneyballoons.com.au). Given how much they reduce heating and cooling losses, they pay for themselves in a short period of time. They also make your building more comfortable.

Further information: [EnergyCut.info/chimney-block](http://EnergyCut.info/chimney-block)



# Invest & save

## What should you ask an insulation installer?

When it comes to getting insulation quotes, check that your insulation installer is accredited and qualified.

Also make sure that they're familiar with the relevant building and safety standards required to insulate your business. This ensures that they'll do the job properly and safely.

When it comes to getting a quote, ask about the following:

### 1) 'R-value' ratings

When you get quotes from different installers, make sure they tell you the R-value rating of the insulation that they're proposing to install.

This will enable you to properly compare their quotes - the higher the 'R' rating, the better the insulation will be when it comes to keeping your business warm in winter and cool in summer.

Make sure that the insulation meets the minimum recommended R-values for your local area. For more information, refer to 'Use the right insulation levels for your area' later in this step.

At the very least, your ceiling should be insulated to a minimum R-value of 4.1 and your walls should be insulated to a minimum of 2.8.

### 2) What insulation are they proposing to use?

When getting a quote, make sure they specify the type of insulation that they're going to use. This will be bulk insulation, reflective insulation or composite insulation. When you find that out, ask them why they are recommending it for your building. You should also check that the product complies with Australian Standard AS 4859.1.

### 3) Is the product fire-resistant?

There are two Australian Standards that rate the fire performance of insulation. The best performance for insulation under the AS 1530.1 standard for combustibility is a pass. With regards to the AS 1530.3 standard, the best insulation score for the flammability, ignitability, heat evolved and smoke developed tests is zero for each. Ask for the test certificates for these standards.



#### 4) **Guarantees and warranties**

Find out who manufactures the insulation and what guarantees and warranties are available with the product. You may want to find out how long the insulation is expected to last and when it needs to be replaced.

#### 5) **How long have they been in business and what experience do they have?**

When hiring an insulation installer, make sure that they have experience. Where possible, use a local company that's been long established in your area.

#### 6) **Get references**

A good insulation installer will always have references. To make sure you're not dealing with a 'fly-by-night' operator, ask for references from their customers that are local to your area.

#### 7) **Are they insured?**

Make sure that they have public liability insurance and workers compensation in case one of their staff gets injured on your premises.

#### 8) **Recycled content insulation**

If you would like to use recycled content, then there are a number of options available.

Glasswool insulation uses old windscreens, window glass and glass bottles in its ingredients; polyester insulation can use recycled plastics; and cellulose fibre insulation uses old phone books and newspapers.

#### 9) **Installer declaration**

Make sure they are able to provide an installation certificate at the end of the job. This should contain all the information about the installer, their company and the insulation products that were installed. It may be useful for future reference.

#### 10) **DIY insulation installation**

If you install your own insulation, there are sources available to help you install it safely and effectively:

- Follow the on-pack instructions.
- Look for instructions and videos on the manufacturer's website.
- Download the ICANZ 'Insulation Handbook Part 2' from [EnergyCut.info/icanz-insulation-guide](https://www.energycut.info/icanz-insulation-guide)

## For more information

If you need more advice, talk to your insulation installer or visit the website of ICANZ – the Insulation Council of Australia and New Zealand.



Their members include Bradford Insulation, Fletcher Insulation and Knauf Insulation. Together they directly employ over 1,000 people in Australia and New Zealand and distribute over 1,200 insulation product lines to a wide range of industries: [icanz.org.au](http://icanz.org.au)

## Use the right insulation levels for your area

Different types of businesses can have different insulation needs, depending on the kind of business they're in. Different climate zones also require different levels of insulation.

For example, a business in Darwin will require different insulation, heating and cooling than a business in Hobart.

In some areas, reducing heat loss is the insulation priority. In other areas, it's reducing heat gain. In yet other places, reducing heat loss and gain have an equal priority. There is no 'one-size-fits-all' solution.

The following table from the Building Council of Australia gives an indication of the minimum levels of insulation required for the following locations and types of climate.

Climate Type and Example Locations	Total 'R' Value Levels			
	Roof / Ceiling*		Wall	
	Residential	Commercial	Residential	Commercial
<b>Cool Temperate and Alpine</b> <b>Reducing heat loss is the main priority</b>				
Melbourne, VIC	4.6	3.2	2.8	2.8
Canberra, ACT	4.6	3.7	2.8	2.8
Hobart, TAS	4.6	3.7	2.8	2.8
Mt Gambier, SA	4.6	3.2	2.8	2.8
Ballarat, VIC	4.6	3.7	2.8	2.8
Thredbo, NSW	6.3	4.8	3.8	3.8
Katoomba, NSW	4.6	3.2	2.8	2.8



Climate Type and Example Locations	Minimum Insulation Levels (Material or Total R-values)			
	Roof / Ceiling*		Wall	
	Residential	Commercial	Residential	Commercial
<b>Hot &amp; Dry and High Humidity</b>				
<b>Reducing heat gain is the critical priority</b>				
Darwin, NT	4.1	3.2	2.8	3.3
Cairns, QLD	4.1	3.2	2.8	3.3
Broome, WA	4.1	3.2	2.8	3.3
Marble Bar, WA	4.1	3.2	2.8	3.3
Mt Isa, QLD	4.1	3.2	2.8	3.3
Tennant Creek, NT	4.1	3.2	2.8	3.3
Townsville, QLD	4.1	3.2	2.8	3.3
<b>Warm/Mild Temperate and Warm &amp; Humid</b>				
<b>Reducing heat loss and heat gain are equally important</b>				
Brisbane, QLD	4.1	3.2	2.8	3.3
Perth, WA	4.1	3.2	2.8	2.8
Alice Springs, NT	4.1	3.2	2.8	3.3
Bourke, NSW	4.1	3.2	2.8	2.8
Sydney, NSW	4.1 - 4.6	3.2	2.8	2.8
Adelaide, SA	4.1	3.2	2.8	2.8

\* According to the Building Council of Australia, these minimum insulation levels will be higher if your roof has an upper surface 'absorptance value' of more than 0.4<sup>23</sup>

23 Source: ICANZ

## Keeping your roof spaces cooler

In summer, the temperature of roof areas can get up as high as 60–70°C.<sup>24</sup> In addition to insulation and roof ventilation, the colour of the roof can play a key part in keeping your roof spaces cooler.

This section shows you how to keep the roof cool in your business premises.

### How do whirlybirds work?

A roof-mounted whirlybird uses wind power to remove hot air from enclosed attic and rooftop spaces. When they expel the hot air, the whirlybirds rely on the vents in your eaves to draw in the cooler outside air.



Many business have used whirlybirds over the years, but some companies are now replacing them with solar-powered roof-cavity ventilators.

### Solar-powered roof-cavity ventilator

Solar-powered roof-cavity ventilators have proven to be very effective in removing heat from enclosed roof spaces. The small solar panel drives the fan motor, which gives it a significant performance boost over the whirlybirds:

- The average whirlybird moves approximately 100m<sup>3</sup>/h (Cubic Metres of Air Per Hour).
- Depending on the make and model, the manufacturer claims that a single solar-powered ventilator is “10-30 times more powerful” than a whirlybird.<sup>25</sup>

It is far more effective in reducing the heat build up in your roof space. This can lead to lower air-conditioning cooling costs.

One advantage of these units is that you can link them to a roof thermostat that starts to extract the air only when the temperature reaches a certain level.



*The Solar Whiz roof-cavity ventilator with heat extraction functionality<sup>25</sup>*

<sup>24</sup> [EnergyCut.info/whirlybird-specs](http://EnergyCut.info/whirlybird-specs)

<sup>25</sup> [EnergyCut.info/which-whirlybird](http://EnergyCut.info/which-whirlybird)

<sup>26</sup> [EnergyCut.info/whirlybird-specs](http://EnergyCut.info/whirlybird-specs)



This ensures that the unit doesn't kick in on colder winter days, when you need the warmth to stay in your roof cavity.

An EcoSmart Electrician can give you professional advice about the various solar-powered and powered roof-cavity ventilator options for your roof space.

## Matching ceiling vents to roof-cavity ventilators

Within a business environment, there are many factors and appliances that generate heat. Rather than fully relying on your air conditioner, you can partially extract this heat using:

- a solar-powered ventilator on your roof
- ceiling grille vents in your business premises.



*A ceiling grille vent*

During hot summer days, these ceiling grilles can be left open. The hot air in your premises rises through the open ceiling grilles and the powered ventilator on your rooftop sucks the hot air out.

During winter, you can shut the ceiling grilles to keep the heat in. The thermostat can switch off the heat extractor on the solar-powered or powered ventilator during colder weather – this helps to keep any warm air in the roof space.

Hybrid Wind Ventilators with smart controls are able to monitor conditions inside and outside to make sure that you are not accidentally bringing in hot air. This ensures that your ventilation system is only bringing in cooler air from outside. In winter it has a reverse setting which can bring in warmer air from outside when the conditions are right.

### Ventilation and heat extraction systems

**Australian-designed solutions that ventilate buildings and extract heat from the roof space include:**

[www.Ventis.com.au](http://www.Ventis.com.au)

[www.SmartBreeze.com.au](http://www.SmartBreeze.com.au)

[www.SolarWhiz.com.au](http://www.SolarWhiz.com.au)

[www.Edmonds.com.au](http://www.Edmonds.com.au)

[www.Odyssey.com.au](http://www.Odyssey.com.au)

**These products can make your premises more comfortable and will potentially cut your heating and cooling bills at the same time.**

## Duct insulation

In a lot of small businesses, the cooling ducts from the air-conditioning are located in hot roof spaces and are poorly-insulated. This can affect the cooling efficiency and running costs of the air-conditioning system.

If you have air-conditioning ducts in your roof space, the way to solve this problem is to:

- improve the insulation on your air-conditioning ducts – this needs to be applied to the outside surface of the duct
- ensure that there are no air leaks from the ducts
- have a solar-powered ventilator to remove heat from the roof space.



## The benefits of a cool roof

On a sunny day, the inside of a black car will be hotter than a white car. It's similar with a roof. The darker the roof, the more heat it absorbs and the hotter it will be inside your premises.

Painting a roof white or a pale colour, maximises the solar reflectance of a roof – this reduces the amount of heat that is transferred to the building below.

Reflecting heat away from your rooftop can make a significant contribution to preventing heat build-up in your roof space.







According to researchers from the University of South Australia, painting your roof a light colour or choosing a new one that is light in colour, could reduce annual heating and cooling costs by between 4-8%.<sup>27</sup>

Many businesses in Australia have dark-coloured rooftops. These absorb a lot of heat from the sun. In turn, this heats up the workplaces beneath the roofs.

Light coloured roofs can reflect up to 70% of summer heat gain.<sup>28</sup> According to [YourHome.gov.au](http://YourHome.gov.au), this is around 50% more than a dark roof. According to Dulux, this has the potential to reduce rooftop surface temperatures by as much as 20-35°C.<sup>29</sup>

This in turn reduces air-conditioning costs as less heat gets transmitted into the business premises below. This is particularly the case when you have air-conditioning ducts running through your roof cavities.

In workshops or warehousing with no air conditioners, having a lighter coloured roof can also make the workplace far cooler and more comfortable for staff.

### Australian Ethical Investments (AEI), ACT

With the retrofit of their building, Australian Ethical Investments (AEI) reduced their energy use by 52%, saving approximately \$20,000 a year.

They utilised double glazing which cut heating demand by around 8% and installed new insulation which reduced the cooling load by 24%.

AEI's Director Howard Pender said, "The existing building was akin to keeping milk fresh by storing it in a cardboard box. The refurbished building is an esky."<sup>30</sup>

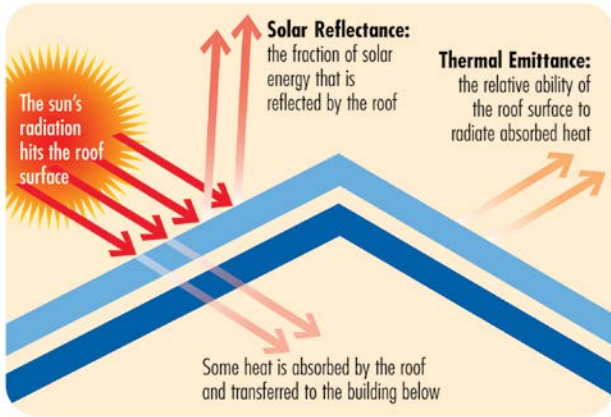
<sup>27</sup> [EnergyCut.info/paint-roof](http://EnergyCut.info/paint-roof)

<sup>28</sup> [EnergyCut.info/yh-shading](http://EnergyCut.info/yh-shading)

<sup>29</sup> [EnergyCut.info/dulux-roof](http://EnergyCut.info/dulux-roof). According to Dulux, the Cooling Energy Savings will be influenced by choice of colour, building design (including roof pitch, materials & window placement), insulation & ventilation, occupancy use, shading, location, climate, roof pitch & ratio of exposed roof area to floor area.

<sup>30</sup> [EnergyCut.info/trevor-pearcey](http://EnergyCut.info/trevor-pearcey)

## How do you measure the effectiveness of a cool roof?



A cool roof should be able to do two things well. As can be seen in this diagram:

- It should reflect the sunlight away from the building. This is called solar reflectance (SR).
- The roof should be able to cool itself quickly. This is called thermal emittance (TE).

After reflecting the sun's heat away from the building, the measure of how much leftover heat has been absorbed is called 'solar absorptance' (SA) and it's measured on a scale of 0 to 1.

If the SA value of a roofing product is near to 1, this means it will absorb more heat into the building than a roof product that is nearer to 0.

The Whitehaven Colorbond Coolmax product below has a SA value of only 0.23. When it comes to keeping a building cooler, it is more effective than the Monument Colorbond roofing product that has a SA rating of 0.73. This lower SA rating will result in lower cooling bills.



Whitehaven,  
SA = 0.23



Manor Red,  
SA = 0.69



Loft,  
SA = 0.71



Monument,  
SA = 0.73

31 Image courtesy of the Cool Roof Rating Council.



## What are the benefits of a cool roof?

There are numerous benefits in having a cool roof:

- It can cut your air-conditioning bills.
- If you don't have an air conditioner, it may save you having to buy one.
- It could extend the life of your air-conditioning system.
- A cool roof can help insulation work more effectively by reducing the heat load in the attic space.
- It reduces summer peak electricity demand due to air-conditioning.
- It reduces the cooling load on refrigerators and coolrooms.
- It makes a workplace with no air-conditioning more comfortable for staff.

Any building can have a cool roof installed on it. During the construction process, you can install a light coloured roof (you should choose a lighter coloured roof regardless of the roofing material that is being used). After construction or during renovation, lighter coloured paints and specialist paint products can also be applied to the roof.

According to the City of Melbourne 'Cool Roofs' research report,<sup>32</sup> the following roof types are suitable for this cool roof technology:

- corrugated iron / zincalume / Colorbond
- concrete
- bitumen
- tile
- slate

### Are cool roofs for everybody?

**Although cool roofs are a good solution for much of Australia, if your business is in a region where heating is regularly needed, a cool roof may not be appropriate, as heat absorption via the roof may be of benefit in winter.**

<sup>32</sup> EnergyCut.info/melb-cool-roofs

### Why change the colour of your roof?

“One thing all business owners can do is to have a lighter coloured roof, known as a cool roof,” says Dr Pockett, from the University of South Australia.

“Paint the roof as light coloured as your council area will allow. A cool roof reflects sunlight (including ultraviolet and infrared rays) ensuring the surface will not get as hot during the summer. That leads to less heat entering work spaces. It essentially bounces the heat off of your roof.

“Going from a dark to light-coloured roof can decrease your annual energy costs for heating and cooling by 4-8%. With quality reflective paint technology designed to repel dust and dirt, this is a low maintenance roof solution.”<sup>32</sup>

Installing reflective sarking under the roof surface will reflect radiant heat and help to reduce heat from entering the building. For reflective sarking to work as a heat barrier, it must have a clear space of at least 20mm between its reflective surface and the underside of the roofing.

Before considering changing the colour of your roof, make sure you have maximised your roof insulation for optimum results.

### Milner Meat & Seafood, NT

At Milner Meat & Seafood in Alice Springs, they applied two coats of white gloss paint to all roof areas to reflect the sun’s heat. This reduced internal temperatures by up to 4°C. For a relatively small cost, this will reduce the need for air-conditioning, saving 5% and almost \$2,000 off their annual power bill.<sup>34</sup>

### Buyer Beware

Some cool roof product suppliers have made exaggerated claims concerning the value and effects of their product. As such, it pays to check that the product or service has been independently tested and verified.

If you’re looking to paint your roof, employ someone with experience in this area. You should also ask for references from customers who can vouch for their work.

<sup>33</sup> Quote courtesy of the University of SA and the Sustainable Energy Centre at the Barbara Hardy Institute.

<sup>34</sup> [EnergyCut.info/milner-meat-seafood](http://EnergyCut.info/milner-meat-seafood)



## For more information

Cool roof products are available from leading paint companies in Australia. There are also a range of specialist cool roof companies. Further information is available via the following links:

The Fifth Estate: Cool roofs versus dark roofs – a special report

[EnergyCut.info/cool-vs-dark](https://www.energycut.info/cool-vs-dark)

Cool Roof Rating Council – cool roof resources and reports from America

[coolroofs.org/resources/overview](https://coolroofs.org/resources/overview)

Energy Star certified roof products

[EnergyCut.info/energy-star-roof-products](https://www.energycut.info/energy-star-roof-products)

Report: 'Economic comparison of white, green and black flat roofs in the United States'

[EnergyCut.info/economic-benefits-white-roofs](https://www.energycut.info/economic-benefits-white-roofs)

## Insulating underneath flooring and signs

Flooring can account for around 10-20% of winter heat loss.<sup>35</sup> Suspended flooring often has electrical cables underneath it, so you or your installer should take care when installing insulation there (particularly if you're using reflective foil insulation).

If you cover your windows with advertising signs, you should also ensure that you put insulation between the sign and the window (or behind the window). This will help to stop the sun's radiant heat from entering the building via your sign.

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<sup>35</sup> [EnergyCut.info/floors-insulation](https://www.energycut.info/floors-insulation)

## Garage door insulation

Some small businesses use garage space for warehousing. If your premises has a garage next to an area that's heated or cooled, you should consider insulating the garage door. This will help to minimise the loss of conditioned air from your premises. Plus it will make the working conditions in the garage area more comfortable for your staff.



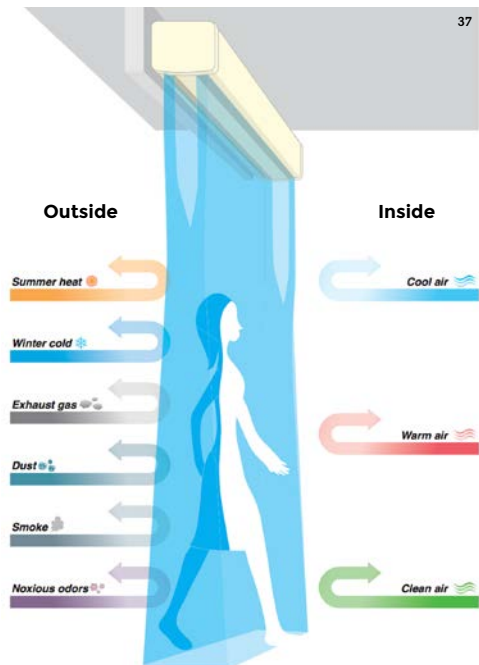
36

## Air curtains, revolving doors and automated doors

### Air curtains (also known as 'air doors')

If your premises has an entrance that has to remain open to the elements, then an air curtain (also called an 'air-door') can act as an insulating temperature barrier between the outside and inside. In summer they prevent cool air from getting out and hot air from getting in. In winter, they do the reverse. They can also help to minimise the loss of chilled air from coolrooms. This can potentially reduce your air-conditioning bills.

Air curtains are created by a fan that forces air from the top of the door opening to the bottom, creating an invisible 'curtain'. The fan that powers the jet of air needs to be strong enough to reach the floor.



37

36 Image source: doorinsulationkit.com

37 Image courtesy of Mitsubishi Electric



The benefit of air curtains on external doors is maximised when they're used in conjunction with automatic doors, where the air curtain only kicks in when the door opens and automatically turns off when the door shuts.

The other benefit of air curtains is that they can block out external smells, pollution and bugs.

To achieve a reduction in overall HVAC costs, air curtains need to be properly installed. If the unit is installed incorrectly, undersized or underpowered for the task, you may see little to no energy savings. When installing an air curtain, ensure that it is highly efficient and located where there is no significant wind factor.

Air curtains use energy, so you need to be sure that the energy savings are greater than the energy costs. That's why it pays to get expert advice when you buy them and have them installed. To see if an air curtain would be appropriate and cost-effective for your business, talk to your EcoSmart Electrician or technical services provider.

## Revolving doors and automated doors

In summer, automated doors help to keep the cool air in and the hot air out. In winter, they do the opposite by keeping warm air in and cold air out. Options include automatic sliding doors, revolving doors and air lock doors. Air locks are used in entrance lobbies and have two sets of doors. As the front doors open, the second inside doors remain shut. These inside doors only open when the front doors have shut.

# Insulation and windows

## How home-based businesses can save money with the 'Windows Energy Rating Scheme' (WERS)



As with insulation, windows have the ability to make your business premises cooler in summer and warmer in winter.

A business can lose up to 40% of its heat through windows, leading to an increase in heating costs. Similarly, it can gain up to 87% of its heat through windows, leading to an increase in cooling costs. That's why improving the thermal performance of windows can help to reduce energy costs.

The 'Window Energy Rating Scheme' (WERS) rates the energy efficiency of windows, enabling consumers to choose those with the highest thermal performance.

On the website, [www.wers.net](http://www.wers.net), the red stars show how efficient the window is at keeping heat in and the blue stars show how efficient the window is at keeping heat out. Members of WERS can provide certificates for windows with the star ratings to show their performance.

As with other star-rating schemes, more stars mean more efficiency.

If a window has no stars, it won't perform well. If it has the maximum possible 10 stars (5 stars for cooling and 5 stars for heating), then the window will have strong thermal resistance and will be able to substantially slow the transfer of heat.

If you're replacing your windows, install ones with the highest star rating you can afford. This will help to reduce your heating and cooling costs.

WERS has a searchable list of 250,000 products: [EnergyCut.info/wers-commercial-film-products](http://EnergyCut.info/wers-commercial-film-products)

To find out more about WERS, visit: [EnergyCut.info/wers-info](http://EnergyCut.info/wers-info)





### Why are energy efficient windows so important?

Standard windows can significantly impact your heating and cooling bills. They are responsible for 46-61% of unwanted heat loss during cooler months. They are also responsible for 79-86% of heat gain during warmer times of the year.<sup>38</sup>

## What should you look for when buying windows for commercial premises?

When it comes to saving energy, knowing your way around windows is important if you want to maximise your financial savings.

When purchasing windows for commercial business premises, you need to take into account the 'U' value of the window and its SHGC rating. If retaining warmth is important to you, you also need ask for low 'E' glass. These terms and their importance are explained below.

- ▶ **'Solar Heat Gain Coefficient' and how it can save you money**
- ▶ **Selecting a window for your climate zone**
- ▶ **Window frames**
- ▶ **Double glazing**
- ▶ **Retrofit glazing**
- ▶ **Window film**
- ▶ **Use an AGGA accredited glazier**
- ▶ **Choose an AWA (Australian Window Association) member when purchasing window and door products**

### What's a 'U-Value'?

The 'U-value' helps you to judge the insulation effectiveness of a window – it's a measure of how well a window stops heat from escaping. Go for the lowest figure – a low 'U-value' means that the whole window performs well in keeping out the heat and cold.

For more information, visit [EnergyCut.info/wers-faq](https://EnergyCut.info/wers-faq)

<sup>38</sup> WERS 'A Simple Guide to Sustainable Windows' Report: [EnergyCut.info/sustainable-windows-report](https://EnergyCut.info/sustainable-windows-report)

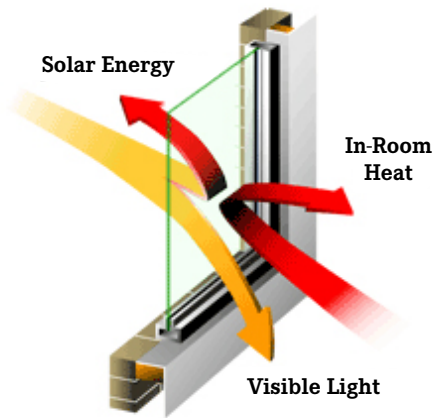
## 'Solar Heat Gain Coefficient' and how it can save you money

The amount of solar heat that gets through a window is measured using a term called 'Solar Heat Gain Coefficient' (SHGC).

If you want to reduce the amount of heat coming in via your windows, then get windows with a low SHGC rating. This will help to reduce your air-conditioning cooling costs.

If you're in a cold climate and want to increase the amount of warm winter sun that comes in, then get a window with a higher SHGC reading. This can help to reduce your winter heating costs.

However, during summer, windows with a higher SHGC reading need to have proper shade outside, otherwise they'll increase your air-conditioning cooling costs.



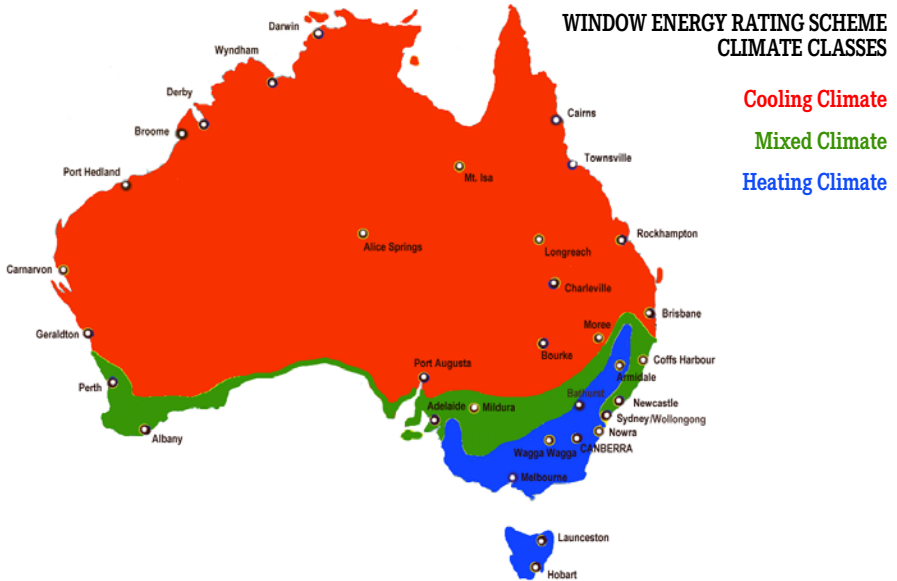
### Low 'E' glazing

When you purchase window glazing, if you want to retain heat in your premises, ask for low 'E' glass. The 'E' stands for 'thermal emissivity' and a low 'E' glass has improved insulating properties that result in less heat loss. This is particularly useful in colder climate zones. Low 'E' Glazing can also be incorporated into Double Glazing to achieve even higher performance.



## Selecting a window for your climate zone

Different types of windows are recommended for different parts of Australia.



To find out the most energy efficient windows for where your business is based, visit:

[EnergyCut.info/window-selection-by-climate](https://www.energycut.info/window-selection-by-climate)

The Window Energy Rating Scheme (WERS) has a range of information about energy efficient windows: [EnergyCut.info/energy-efficient-windows](https://www.energycut.info/energy-efficient-windows)

The Efficient Glazing website can also help you to make informed choices when purchasing efficient windows and doors: [EfficientGlazing.net](https://www.efficientglazing.net)

## Window frames

From an energy efficiency point of view, timber and uPVC window frames are better than aluminium window frames; and double glazing is far better than single-pane windows.

Aluminium conducts heat more than wood and uPVC. This means that aluminium window frames can get hotter. They can also create a 'thermal bridge' that brings heat into or out of a building.



## Double glazing

Double glazing creates an insulating gap between two panes of glass. This is filled with air or an inert gas and can significantly reduce the heat flow without affecting the light levels. Indeed, some types of double glazing can halve the heat lost or gained through windows.

The gap between the two panes of glass is usually 6–18mm. Wider cavities provide a lower U-value which improves the insulation value of the window. A gap of 12mm is the preferred option.<sup>39</sup>

In addition to reducing your heating and cooling costs, double glazing can insulate against outside noise when the correct double glazing unit is selected. Using double glazing with different interior and exterior pane widths can also increase the noise insulation potential of the windows. For more information, contact the AWA, or your chosen window company.

When it comes to double glazing though, it pays to get a variety of quotes from different parties as it can be quite expensive. Don't accept the first price that comes along.

<sup>39</sup> [EnergyCut.info/yh-glazing](http://EnergyCut.info/yh-glazing)



## Buying Australian-made double glazing or importing it?

To cut costs, some people have resorted to importing double glazing directly from manufacturers in China. If you go this route, be aware that the glass needs to meet Australian standards. You also need to ensure that you don't run into warranty problems if your glass is broken in transit.

If you want to buy double glazing that is made in Australia, then ask if the manufacturer or supplier is a member of IGMA (Insulating Glass Manufacturers Affiliation). IGMA represents Australian manufacturers of double glazing and all its members supply insulating glass products that are compliant with standard AS/NZS4666.

For a full list of IGMA members, visit:

[EnergyCut.info/igma-members](https://EnergyCut.info/igma-members)



## Gray's Bakery, VIC

Gray's Bakery has increased the insulation of their building by installing coolroom panelling. This is keeping the bakery warmer in winter and cooler in summer.

They have also fitted clouded double glazed windows and doors to capture the sun and light during the winter months.

According to owner Janine Gray, this is reducing the demands on heating and lighting at this busy cafe and bakery in regional Victoria.<sup>40</sup>

<sup>40</sup> [EnergyCut.info/grays-bakery-case-study](https://EnergyCut.info/grays-bakery-case-study)

## Retrofit glazing

Also known as ‘secondary glazing’, ‘retrofit glazing’ is where you add an extra layer of glazing to your existing single-glazed windows. It’s cheaper than double glazing and it’s suitable for older buildings with heritage or period windows.

As with double glazing, retrofit glazing improves the thermal performance of your windows, which helps to reduce your heating and cooling bills. Along with these thermal benefits, secondary glazing can also insulate against outside noise. Although not as good performance-wise as double glazing, retrofit glazing can make a very big difference to the energy efficiency of your windows.

Secondary glazing manufacturers have rated their products through WERS. Check out these ratings when choosing your retrofit glazing. Also make sure the installer has a strong track record and good references.



### DoSomething, NSW

After relocating from Sydney to the Blue Mountains, DoSomething found that their rented office was extremely cold in winter.

To resolve this problem, DoSomething:

- installed Magnetite secondary glazing on their existing office windows
- placed a chimney balloon in the unused chimney (this prevented heat loss).

Magnetite is a retrofit double glazing system that adds a secondary glazing layer to an existing window. This technology allows you to receive all the benefits of double glazing without replacing your windows.

Secondary glazing is cheaper than double glazing and can be added to any existing windows, doors, skylights and glass areas. You don’t have to replace whole windows as you do with double glazing and it’s an ideal option for heritage buildings where window frames cannot be changed. The secondary glazing can also reduce noise by up to 70%, which can help to improve productivity.

For those renting cold office space, why not ask your landlord to install secondary glazing? It’s a relatively low-cost measure that will also add value to the landlord’s property.<sup>41</sup>

<sup>41</sup> [EnergyCut.info/dosomething-research](http://EnergyCut.info/dosomething-research) and [EnergyCut.info/magnetite-glazing](http://EnergyCut.info/magnetite-glazing)

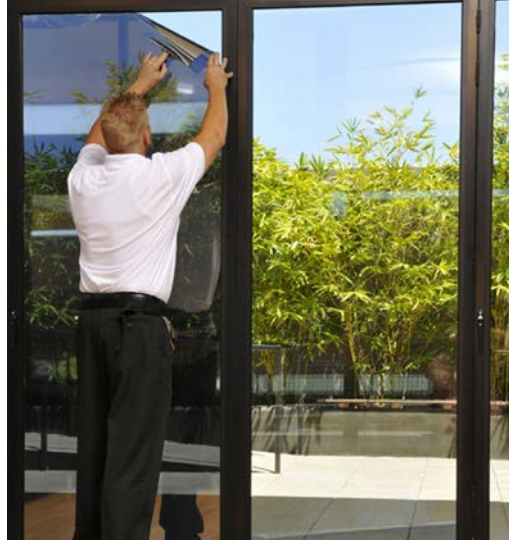


## Window film

If you can't afford double glazing, then consider putting window film onto your existing windows. This can be done quickly and installers don't have to remove the glass from the frame.

Window film can help to absorb and reflect the solar rays that heat up your premises.

The main benefit from window film is during summer. In WERS tests, one film product achieved a 5-star cooling rating with a cool percentage of 70%.<sup>43</sup>



A low 'E' film can reduce heat-loss during winter and reject the heat in summer. 'Low E' means that the glass with film on it has improved insulating properties that result in less heat loss on cold days and greater heat rejection on warm days. In WERS tests, one film product achieved a four and a half star heating rating with a heating percentage of 47%.<sup>44</sup>

## WERS For Film rating scheme

The Windows Energy Rating Scheme now lists films on their website. This WERS For Film initiative enables you to compare the energy claims of different window films.

Participating film manufacturers have products applied to glass in a window by an independent laboratory that's accredited by the Australian Fenestration Rating Council.



The window with film applied then receives a star rating for heating and cooling, similar to the energy-star stickers on white goods.

<sup>42</sup> Image courtesy of WFAANZ

<sup>43</sup> EnergyCut.info/wers-film-ratings

<sup>44</sup> EnergyCut.info/wers-film-ratings

The following two links contain the listings and results for applied film products that have been tested for their energy efficiency performance.

- The Residential Film Products are for the conventional windows used by many small businesses: [EnergyCut.info/wers-residential-film-products](https://www.energycut.info/wers-residential-film-products)
- The Commercial Film Products are for commercial shopfront glazing: [EnergyCut.info/wers-commercial-film-products](https://www.energycut.info/wers-commercial-film-products)

## Further information

The Window Film Association of Australia and New Zealand (WFAANZ) comprises window film manufacturers, suppliers and applicators.

All WFAANZ members warranty their window film products. Warranties for film cover most potential defects such as de-metalisation, peeling, bubbling, delaminating and colour change. Further warranty information can be obtained by consulting each manufacturer directly.

You can get more information on window film at this site:

[www.wfaanz.org.au](http://www.wfaanz.org.au)

They also have a searchable listing for window film installers:

[EnergyCut.info/find-a-window-film-installer](https://www.energycut.info/find-a-window-film-installer)

### Indulge Fine Belgian Chocolates, VIC

Indulge Fine Belgian Chocolate in Bendigo put a special film over their windows to help maintain temperatures in winter and summer. To keep temperatures cooler, they also installed blinds at the shop's front windows to block out the afternoon sun.<sup>45</sup>

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<sup>45</sup> [EnergyCut.info/indulge-choc](https://www.energycut.info/indulge-choc)





## Use an AGGA accredited glazier

The Australian Glass and Glazing Association (AGGA) is the peak body for the glass and glazing industry. When installing window glass of any kind, you should use the services of an AGGA accredited glazier. These are skilled tradespeople who know and work to the AS 1288 Australian Standard.

You can use the following links to find an AGGA accredited glazier in your state or territory:

**NSW/ACT:** [EnergyCut.info/agga-nsw-act-glaziers](https://EnergyCut.info/agga-nsw-act-glaziers)

**Queensland:** [EnergyCut.info/agga-qld-glaziers](https://EnergyCut.info/agga-qld-glaziers)

**South Australia:** [EnergyCut.info/agga-sa-glaziers](https://EnergyCut.info/agga-sa-glaziers)

**Tasmania:** [EnergyCut.info/agga-tas-glaziers](https://EnergyCut.info/agga-tas-glaziers)

**Victoria:** [EnergyCut.info/agga-vic-glaziers](https://EnergyCut.info/agga-vic-glaziers)

**WA & NT:** [EnergyCut.info/agga-wa-nt-glaziers](https://EnergyCut.info/agga-wa-nt-glaziers)

## Choose an AWA (Australian Window Association) member when purchasing window and door products

There are many reasons to choose an AWA member when purchasing your window and door products:

- AWA Manufacturer members are members of the Window Energy Rating Scheme and can provide certified performance results for their window products.
- Members manufacture window and door products in compliance with all relevant Australian Standards.
- Members guarantee their windows against faulty workmanship and materials for a period of 6 years (subject to correct installation and product maintenance).



Using an AWA member when purchasing your window and door products significantly reduces the risk of purchasing the incorrect product for your application.

## Further information

The Glass and Glazing Association of Australia (AGGA) has a very good guide to glass and energy efficiency: [EnergyCut.info/AGGa-glass](https://EnergyCut.info/AGGa-glass)

## Further information

### Ceiling insulation and halogen downlights

If you want to maximise financial savings from ceiling insulation, then don't have halogen downlights.

Halogen downlights can get extremely hot, so from a fire safety point of view you need to keep a clear space around them in your ceiling cavity. This helps to avoid them overheating but it can minimise the effectiveness of ceiling insulation.

In winter, hot or warm air can escape through this insulation gap and in summer air-conditioned cold air can escape through it too.

A better alternative are LED downlights. In addition to being safer, they use a lot less energy and last a lot longer. You can look for these and other non-halogen lighting alternatives in 'Step 8 - Cut your lighting bills'.

### Further information on insulation

There are two Australian government websites that give excellent advice on installing insulation in your business or home.

YourEnergySavings.gov.au provides good information on the basics:

[EnergyCut.info/yes-insulation](https://www.energy.gov.au/yes-insulation)

YourHome.gov.au has a detailed web page and fact sheet about insulation:

[EnergyCut.info/yh-insulation-leaflet](https://www.energy.gov.au/yh-insulation-leaflet)

YourHome.gov.au also has a very good web page and fact sheet regarding energy efficiency and windows: [EnergyCut.info/yh-glazing](https://www.energy.gov.au/yh-glazing)



## Eastern Road Quality Meats, NSW

In order to keep the temperatures cool in their shop, Eastern Road Quality Meats installed double insulation in the ceiling.

In order to reduce after-hours energy requirements, they also placed insulation covers on their open fridges. These adjustments have contributed to their overall energy savings of around 25% per year.<sup>46</sup>



<sup>46</sup> [EnergyCut.info/butcheries-case-study](https://www.energycut.info/butcheries-case-study)





## STEP 11

# Cut your IT energy costs

**These days, we're using far more computers, tablets and smartphones. As a result, the amount of energy being used by information technology (IT) equipment has increased as well.**

The amount of money SMEs spend on IT equipment and energy costs can easily be reduced. Many small business owners have a desktop computer at work and another one at home. Purchasing a portable laptop can reduce the number of computers needed to one and reduces the amount of energy used.

Another simple way to get started is to ask if equipment is being left on unnecessarily and to make sure it's turned off at the power point at the end of the working day. Only critical equipment should be left on, such as servers and backup drives.

Turning off IT equipment, however, is not the only way to save money. This section will show the other options available to you.



# Did you know?

## Step 11: IT

By programming the 'wake' and 'sleep' periods for your printers, they can automatically turn off at the end of the working day and over weekends.

See page 258

A sleeping computer will save you money as it uses as little as 10% of full power.

See page 254

Reducing the brightness of LCD monitors can reduce the energy used from 34W to 20W, saving you money.

See page 253

Screen savers can prevent your computer from entering sleep mode. To save money, you should disable all the screen savers on your computers.

See page 253



See page 262



See page 264

**When you use a laptop computer instead of a desktop and monitor, you can reduce your energy consumption by up to 80–90%.**

See page 263

**Printers and photocopiers use a lot of energy when the machines are warming up. As such, it pays to plan your printing and copying so that you do it in batches.**

See page 257

**Going paperless in your office saves on printer energy costs, paper costs, postage costs and cartridge consumables. Switching off or getting rid of your printer also reduces the heat that it generates, which can lower air-conditioning costs.**

See page 255

**Printers and other imaging equipment that have earned the ENERGY STAR label are 30% more efficient than standard models that are not certified.**

See page 262

**Free file-sharing software like Google Docs enables staff to telecommute and collaborate remotely, potentially saving on office and transport costs.**

See page 259



# In this step

## No cost/low cost

- ▶ Switch it off!
- ▶ Busting the 'leave-it-on' myth
- ▶ Manage your monitors
- ▶ Put computers to sleep during the workday
- ▶ Keep your equipment cool
- ▶ Save money on printing costs

## Invest & save

- ▶ Software downloads that can save you money
- ▶ Think before you buy
- ▶ Buy laptops and save money on energy use
- ▶ Buy energy efficient monitors
- ▶ Investigate the computer server option
- ▶ Further IT information





## No cost/low cost

### Switch it off!

Most people leave their WiFi on all the time. They also fail to use the energy-saving options on their IT equipment.

To ensure that your computers, monitors, laptops and printers are drawing zero power when they're not being used, turn them off at the power point at the end of the working day.

A typical IT set-up for one person might include a computer, monitor and multi-function printer. Why not connect them all to a single power board and turn them off with one switch?

When the power point is in a hard-to-reach location, you can make your power board easier to switch off by connecting it to one of the following:

- a remote-controlled plug
- an EcoSwitch
- a foot switch power board.

You can also plug in your computer, monitor and multi-function printer into a 'smart' power board. They detect when your 'master' device has been turned off and kill the power to connected 'slave' devices.

For example, if you turn off a computer, a 'smart' power board will automatically cut power to your monitor and printer. See 'Step 6 - Switch off and save' for more detailed information on the ways to turn off IT equipment.

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***Whether you're a single-person operation,  
or a business with an extensive IT set-up,  
switching off your gear is an easy way  
to save money.***

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## Busting the 'leave-it-on' myth

Some people mistakenly believe that leaving machines on saves more power than switching them off and on again. This is not the case.

Apart from devices that need to be on, like fax machines, photocopiers and computer servers, most other machines that are unlikely to be used within the half hour, can be switched off.

The equipment that needs to be left on, however, should have its energy-saving options and settings fully enabled.

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*'Only after a display has been used for 20–30 years will switching it on and off five times or more per day increase the frequency of faults in power transistors.'*

*– Energy Star<sup>1</sup>*

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### Kinky Curly Straight, SA

“All our IT equipment gets turned off at night, including the power points,” said Kinky Curly Straight co-owner Mojca Bizjak-Mikic. “The IT equipment is set on high-energy efficiency settings, so it switches to sleep mode if not in use.”<sup>2</sup>

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1 [EnergyCut.info/energystar-computers](http://EnergyCut.info/energystar-computers)

2 [EnergyCut.info/dosomething-research](http://EnergyCut.info/dosomething-research)



## Manage your monitors



### Screen savers

Another IT myth is that screen savers save energy. Not true! Generally speaking, screen savers do not save energy and might prevent your computer from entering sleep mode.<sup>3</sup> To save money, you should disable all the screen savers on your computers.

### Displays

In the power settings, many computers now have the option to turn the display off automatically after a nominated period. Save money by setting your display to sleep mode after five minutes of inactivity.

You should also fully turn off your monitor when you go to lunch or leave work.

### Brightness settings

By lowering the brightness on a monitor, you can also reduce the amount of energy it uses. Reducing the brightness of LCD monitors can reduce the energy usage from 34W to 20W.<sup>4</sup>

Over the course of a year, this saving will add up, regardless of what type of monitor you use.

<sup>3</sup> [EnergyCut.info/energy-star-faq](http://EnergyCut.info/energy-star-faq)

<sup>4</sup> [EnergyCut.info/green-at-work](http://EnergyCut.info/green-at-work)

# Put computers to sleep during the workday

5



If you use a desktop computer and monitor for eight hours a day during the week, it can cost up to \$125 in electricity every year.<sup>6</sup>

If you leave your computer fully on at the end of the working day, the cost can be significantly more. Multiply this by every staff member you have and it can quickly add up.

A sleeping computer will save you money as it uses as little as 10% of full power.<sup>7</sup> To maximise your savings, adjust your computer settings as follows:

- Put your monitor to dim and enter a low-power sleep or standby mode after five minutes or less of inactivity.<sup>8</sup>
- Put your computer into standby/sleep or hibernate mode after 30 minutes or less of inactivity.
- Treat your monitor like a light. Turn it off if you're going to be away from your computer for more than a few minutes.

<sup>5</sup> Poster courtesy of News Corp: 1degree.com.au

<sup>6</sup> A typical computer and monitor workstation uses 130-200 watts of power. Further information on computer energy use can be found at: [EnergyCut.info/computer-energy](http://EnergyCut.info/computer-energy)

<sup>7</sup> [EnergyCut.info/green-at-work](http://EnergyCut.info/green-at-work)

<sup>8</sup> [EnergyCut.info/pwr-mgmt](http://EnergyCut.info/pwr-mgmt)



**Tip:** In addition to turning off your computers, laptops and displays at the end of the working day, encourage your employees to put them to sleep when they're going to a meeting or to lunch. One company rewarded staff for putting their computers into sleep mode at lunch time by leaving chocolates on their keyboards!

For details on how to enable energy-saving features on Windows and Mac computers, go to the ENERGY STAR® website: [EnergyCut.info/pwr-mgmt](https://www.energy.gov/energysaver/pwr-mgmt)

## Keep your equipment cool

IT equipment can get hot. That's why some of it contains fans. These fans, however, can use a significant amount of power.

It therefore makes financial sense to ensure that your IT gear is not left in unventilated cupboards or next to other heat-producing machines. You should also make sure that the fans are regularly cleaned.

## Save money on printing costs

When you're writing a document or creating an invoice, your computer is already on. So if you can email a PDF instead of printing the document, you will save energy by not having your printer on.

Going paperless in this way saves on printer energy costs, paper costs, postage costs and cartridge consumables. Switching off or getting rid of your printer also reduces the heat that it generates, which can reduce air-conditioning costs.

This section shows how reducing printer use saves money.

- ▶ **Consolidate your printers**
- ▶ **Reduce postage costs and boost administration efficiencies**
- ▶ **Manage printer behaviour to save energy**
- ▶ **Utilise energy-saving settings**
- ▶ **Use energy efficient printer cartridges**

## Consolidate your printers

If you have multiple printers in your business, why not consolidate and use one central printer instead?

When you get rid of a printer, you don't just cut your energy and cartridge costs, you also get rid of the cost of buying/leasing and replacing the printer at a future date. That can be a significant saving.

**Did you know?** Inkjet printers can use up to half the energy of a laser printer.<sup>9</sup> Make sure that any inkjet or laser printer you purchase is Energy Star® certified.

### Two Men & A Truck, NSW

In the offices of Sydney removal company, Two Men & A Truck, they replaced single desktop printers with one central shared printer. In addition to saving on energy and printer purchase costs, this has also radically reduced the number of toner cartridges used from 60 to 4 per year. These office changes have resulted in savings of \$2,189 over one year.<sup>10</sup>

## Reduce postage costs and boost administration efficiencies

Many companies are no longer posting invoices. Companies that go paperless in their billing departments by emailing invoices in PDF format, save money in five ways:

- they reduce printer energy use
- it saves on paper costs
- it reduces postage costs
- it reduces the staff handling costs of printing the invoices, putting them in envelopes and taking them to the post
- some companies report that digitising their billing processes has brought about money-saving office and administration efficiencies.



<sup>9</sup> [EnergyCut.info/dosomething-research](http://EnergyCut.info/dosomething-research)

<sup>10</sup> [EnergyCut.info/dosomething-research](http://EnergyCut.info/dosomething-research)



## newsXpress Darra, QLD

newsXpress Darra started emailing monthly accounts to customers instead of printing them. This saved them the cost and energy associated with processing paper bills. It also cut down on postage costs and unnecessary printer use.<sup>11</sup>

## Manage printer behaviour to save energy

Printing in colour can use up more energy than printing in black and white. Some printers now enable your business to set rules about when colour can be used and when it can't.

For example, you can set a rule that emails cannot be printed in colour and program that into your printer system. Before buying or leasing a printer, make sure that it can handle this requirement.

You can also save more money by setting your default printing to double-sided.

## Set a 'pull printing' policy

A very effective way of saving energy in your business is to use a printer that enables you to implement a 'pull printing/follow-me printing' policy.

When your employees send a document to the printer, they have to swipe a card on it in order to print and pick up the job. This stops people printing documents and forgetting about them. Hewlett Packard found that this technology can purge print jobs by up to 30%.<sup>12</sup>

This will save on energy costs as well as paper and ink costs.

'Pull printing' allows employees to use any network printer and enables your business to allocate printing costs. By making employees accountable for these costs, they are more careful about how much they print.

## Save money with batch-printing

If you do have to print, you need to be aware that printers and photocopiers use a lot of energy when they're warming up.

As such, it pays to plan your printing and copying so that you do it in batches. This minimises the amount of time that the machines are using energy when warming up.

<sup>11</sup> Sourced from Queensland Newsagents Federation: [www.anf.net.au](http://www.anf.net.au)

<sup>12</sup> [EnergyCut.info/pull-printing](http://EnergyCut.info/pull-printing)

## Utilise energy-saving settings

Some printer companies now allow you to set up a schedule where you automate the 'wake' and 'sleep' periods for your printers. This enables you to program your printers so that they automatically turn off at the end of the working day and over weekends.



When buying or leasing a printer, check whether you have the ability to schedule it in this way. That way, if you forget to turn it off at the plug, the printer will at least put itself into the most efficient sleep mode and save you money.

### How much power does your machine use?

**When a multi-function printer/copier is in sleep mode, some models can still use up to 50W. In idle mode, some models can use up to 80W. When leasing or buying printers, make sure you find out how much energy they use in sleep and idle modes as well as in active printing mode.**

## Use energy efficient printer cartridges

Some printer cartridges also have toner that has a lower melting point than others. The manufacturers of these energy efficient cartridges claim they can achieve energy savings of up to 35% on every page printed.

This is because the temperature at which their toner begins to soften is lower - this means that it doesn't need to be as hot in order to fuse onto the paper.

Established companies like HP now promote the energy efficiency attributes of some of their printer cartridges. Ask your office supplier whether they stock energy efficient printer cartridges.





## Invest & save

### Software downloads that can save you money

Saving money on IT costs has been made easier by new forms of software, some of which are available for free.

#### Cloud computing

'Cloud computing' allows SMEs to save money by cutting costs in many different areas. Off-site storage means you don't have to have a server running on site, saving you power and money.

Free file-sharing software like Google Docs enables staff to telecommute and collaborate, saving on office and transport costs.

Expenses such as couriers, postage, paper and printer ink can be avoided by emailing scanned documents and legal agreements or using download link services such as DropBox, YouSendIt, SugarSync, Box and iCloud etc.

Contracts can also be signed digitally on your iPad using software such as Adobe EchoSign or other applications.

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***“The rise of ‘cloud computing’ means that more processing is done off the machine terminal. This might mean that companies should invest more in their internet connection and less in the processing power of individual machines.”***

*– CitySwitch<sup>13</sup>*

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<sup>13</sup> [EnergyCut.info/equipment-select](http://EnergyCut.info/equipment-select)

## Whitford Real Estate, VIC

At Whitford Real Estate, Director Michael Ferris has saved energy by using 'cloud computing'.

This enables them to sync their mobile phones, tablets and computer systems and use file-sharing services so that documents can be accessed from any location. Taking this approach also means that the costs of printing, transportation and postage can be avoided. Documents can instead be emailed, clients can digitally sign and email contracts and copies can be kept on a server.

"If I'm at an open house I can just send a contract of sale from my iPad while I'm there," said Ferris. "So I don't have to drive back to the office, print it off, then drive back and give it to them. It's more expensive to set up but in the long run it's cheaper."<sup>14</sup>

## Software that automatically shuts down your computer

For small companies, saving money is as simple as turning off a computer at the power point. But if you have more staff, you can buy desktop power management software that maximises the energy-saving potential of all your company's computers.

The following options can all automate the powering down of computers at the end of a working day:

**Greentrac** - 'Greentrac' enables businesses to automate the power management of their Windows and Mac computers. This software can shut down, hibernate or put computers into standby mode. It also gives real-time energy feedback to employees that encourages them to minimise their computer's energy use.

The company behind Greentrac is an Australian SME and they state that users of its software typically reduce PC energy consumption by up to 50-65%. Visit [EnergyCut.info/greentrac-range](http://EnergyCut.info/greentrac-range) for more information.



<sup>14</sup> [EnergyCut.info/whitford-property](http://EnergyCut.info/whitford-property)



**Shutdown Vaccine** – For PC networks, this shareware software can automate power-related tasks such as shutting down all workstations at a particular time. This is downloadable from: [EnergyCut.info/shutdown-software](http://EnergyCut.info/shutdown-software)

**NightWatchman® Enterprise** – ‘NightWatchman® Enterprise’ can securely, remotely and centrally power down both PCs and Mac equipment. It allows organisations to realise significant energy savings.

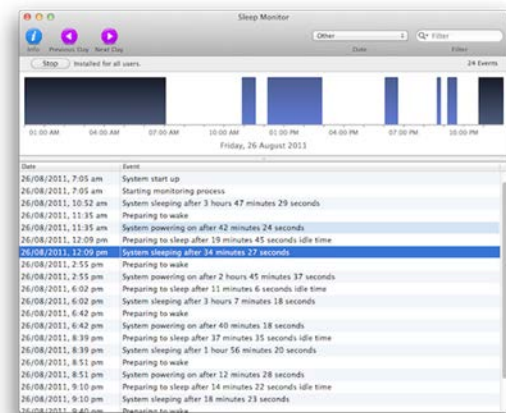
When not in use, computers can be automatically shut down, suspended or put into a hibernated state. With 12 million licenses sold, the distributors claim that NightWatchman® has saved businesses \$1.3 billion. It is downloadable from: [EnergyCut.info/nightwatchman-power](http://EnergyCut.info/nightwatchman-power)



The City of Melbourne deployed NightWatchman® on 1,000 desktops in 2005. By 2012 they had saved \$175,000 and reduced energy use by 1,459,000kWh.<sup>15</sup>

**Sleep Monitor for Mac** – This one isn't free, but you can trial it for 30 days. It charts a Mac's power use, showing how long it has been in use, asleep and switched off.

Go to [EnergyCut.info/sleepmonitor-software](http://EnergyCut.info/sleepmonitor-software) to download a copy.



<sup>15</sup> [EnergyCut.info/melbourne-nightwatchman](http://EnergyCut.info/melbourne-nightwatchman)

## Think before you buy

Sometimes the most business-friendly purchase is not to purchase in the first place! When it comes to buying new equipment, buy only what you really need. It's the first step to saving money.

Consider good-quality second-hand or just-superseded equipment. Last year's top-of-the-range model from a respected brand, might be more energy efficient and cheaper to buy than the latest model. This approach can save you money on both the purchase and running costs. Doing your homework is the key.

Before you buy a new computer or IT equipment, find out how much energy it uses. The savings could quickly add up if you get the more energy efficient option. The more computers you have, the bigger the savings you'll achieve.

Consider leasing your IT equipment as this may offer benefits around cash flow and tax incentives. The leasing company may also handle the recycling of the equipment at the end of its life.

Check if the lease allows you to 'roll-over' into more energy efficient equipment within the term of the agreement.

### Look for the ENERGY STAR label

**Printers and other imaging equipment that have earned the ENERGY STAR label are 30% more efficient than standard models that are not certified.**

**Being certified by ENERGY STAR also means that printers have to enter low-power 'sleep' mode when they're inactive. This means they're saving you money when they're in use and when they're not.**

**They will also save you on paper costs. With ENERGY STAR certified imaging equipment, certain sized equipment is required to print on both sides of the paper.<sup>16</sup>**



<sup>16</sup> Source: EnergyStar.gov



## Buy laptops and save money on energy use

Many small business owners own a desktop computer at work and one at home. To save money, it's best to switch to a single laptop. You don't just save on computer and software purchase costs. When you use a laptop computer instead of a desktop and monitor, you can reduce your energy consumption by up to 80–90%.<sup>17</sup>

When you next update your computers, purchase more energy efficient laptops and switch them off at the end of the day. Doing this can reduce your annual energy costs to only \$12 per laptop.<sup>18</sup>

Laptops also have the additional benefit of being portable, so your employees can use them when they're on the road or working from home.

If you need desktop computers, find out how much energy they use before you buy them. A more energy efficient computer will always save you money on running costs.

Computers that meet the ENERGY STAR specification can use up to 30–65% less energy.<sup>19</sup> Before you buy a computer, check out the models that have earned the ENERGY STAR label at [EnergyCut.info/energy-star-computing](https://www.energycut.info/energy-star-computing)



<sup>17</sup> [EnergyCut.info/sme-office-equip](https://www.energycut.info/sme-office-equip)

<sup>18</sup> A 20-watt laptop can use 40kW of power every year. At 30 cents per kW, that's \$12 per year.

<sup>19</sup> [EnergyCut.info/energystar-computers](https://www.energycut.info/energystar-computers)

# Buy energy efficient monitors

## What type of screen?

When it comes to upgrading your monitors, it's worth remembering that:

- LED flat screens consume less energy than LCD screens.
- Energy efficient LED and LCD monitors can use up to 50% less energy than a CRT monitor.<sup>20</sup>
- You can now buy portable lightweight computer monitors that are powered by a USB 3.0 port. By plugging them into a laptop or desktop computer you can have a cheap and energy-efficient second screen. These screens are getting better in quality and brightness, but if you're buying one, I would recommend that you get a high resolution monitor (1920 x 1080).<sup>21</sup>



## What size screen?

Where possible, use the smallest monitor for the task. Big monitor screens may look good but they use up more energy. Only use them if a big monitor is critical to your work.

## Check the energy-rating label

If you want to compare the energy use of different computer monitors, check the energy-rating label on each device. The more stars, the lower the running costs.

This label also shows the monitor's average energy consumption in kWh. When you see this figure, just multiply it by 30 cents to approximate its daytime running costs. If it uses 260kWh per annum it will cost you approximately \$78 a year in electricity.

Also check if the monitor has received an ENERGY STAR<sup>22</sup> rating. On average, these monitors are 25% more energy efficient than standard monitors and they consume less than 0.5W in sleep mode.<sup>23</sup>

To compare monitor energy use visit: [EnergyCut.info/energystar-monitor-listings](https://www.energycut.info/energystar-monitor-listings)

<sup>20</sup> [EnergyCut.info/LED-vs-LCD](https://www.energycut.info/LED-vs-LCD)

<sup>21</sup> For more information on high resolution portable monitors visit PC Advisor: [EnergyCut.info/portable-monitors](https://www.energycut.info/portable-monitors)

<sup>22</sup> You can search the Energy Star computer monitor database at [EnergyCut.info/energystar-monitor-listings](https://www.energycut.info/energystar-monitor-listings)

<sup>23</sup> [EnergyCut.info/energystar-monitor-listings](https://www.energycut.info/energystar-monitor-listings)



### More stars and smaller screens = more savings

A 15-inch (38cm) six-star-rated monitor can cost \$8.89 a year to run. A 27-inch (68cm) two-star-rated monitor can cost \$43.71 a year. Buying five of the smaller efficient monitors could save \$870.50 in electricity over the five-year lifespan of the product.<sup>24</sup>

## WT Sustainability (WTS), NSW

At WTS, staff use laptops with large LED screens. This saves on printing costs as it enables their staff to review documents side by side onscreen without printing them off.

The LED screens used at WTS also require only half the power of similar-sized LCD screens. In addition, their colour printer is an LED multi-function device that uses 75% less energy than comparable machines. This device is also set up to go into standby mode after only 60 seconds.<sup>25</sup>

## Investigate the computer server option

Some companies do not use standard computers. Instead, their workers use stripped-down, low-power PCs that are linked to a central server that handles all the data processing and storage.

If your business hosts a computer server like this, it can use a lot of energy and generate a lot of heat. This type of infrastructure no longer has to be based in your workplace. Companies with a good internet connection can use a virtual server that is based off-site.

The company hosting your virtual server takes on the responsibility of optimising its performance and you get the benefit of reduced energy and cooling costs.

## Further IT information

To keep up with the latest developments in efficient IT, check out ICT Sustain Review at [ICTsustain.com/review.html](https://www.ictsustain.com/review.html)



<sup>24</sup> Adapted from figures at [EnergyCut.info/monitor-fact-sheet](https://www.energycut.info/monitor-fact-sheet)

<sup>25</sup> [EnergyCut.info/office-pro-case-study](https://www.energycut.info/office-pro-case-study)







## STEP 12

# Reduce equipment energy costs

Within any business, there are two types of equipment:

- the equipment that is specific to the service the business provides, like an oven in a bakery, a wheel-alignment machine in a garage, or a display refrigerator in a cafe
- the sundry equipment that is common to most businesses - computers, air conditioners, phone chargers, printers, microwaves, photocopiers, dishwashers, kettles, fridges etc.

Maximising the energy efficiency of all your equipment will cut the running costs of your business. The easiest way to do this is to:

- switch off equipment when it's not being used (see 'Step 6 - Switch off and save')
- consolidate your existing equipment
- use your existing equipment more efficiently
- replace machines and appliances with more energy efficient models.

This section will show you how to assess and reduce the running costs of your equipment. It will also show you how to purchase energy efficient appliances.



# Did you know?

## Step 12: Equipment

For many small office businesses, equipment can be responsible for 15-30% of their overall energy bills.

See page 272

Sometimes the most business-friendly purchase is not to purchase at all!

When it comes to new equipment, buying only what you need is the first step to saving money

See page 280

If you use a clothes dryer on a daily basis, a heat pump dryer may cost more upfront, but over its lifetime it could save you thousands of dollars in energy bills.

See page 290

Maximising the energy efficiency of all your equipment will cut the running costs of your business. The easiest way to do this is to: switch off equipment when it's not being used; use your existing equipment more efficiently; and replace machines and appliances with more energy efficient models.

See page 267



See page 300

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In the last 20 years, the ENERGY STAR® label has helped Americans to reduce their energy bills by US\$239 billion.

See page 292

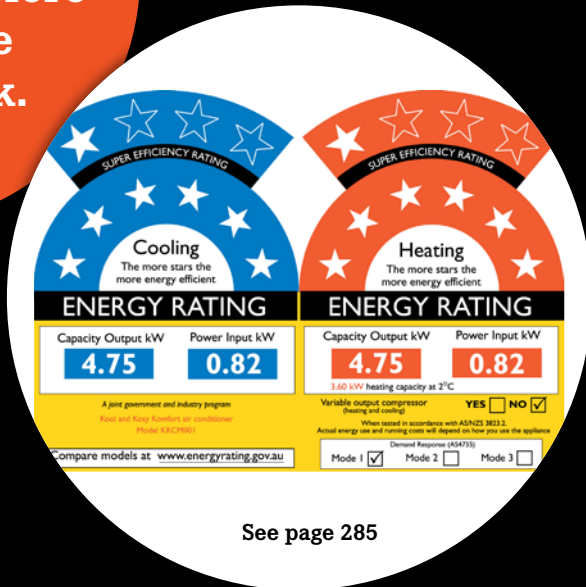
See page 300

The annual cost of operating an electric motor can be 10 times the purchase price.

See page 297

On average, motor systems lose around 55% of their input energy before reaching the end-use work.

See page 299



See page 285

Some compressed air systems lose up to 50% of their air through leaks.

See page 308



# In this step

## No cost/low cost

- ▶ Do an equipment energy audit
- ▶ Maintain your equipment
- ▶ Switch off and save
- ▶ Reorganise the placement of your equipment
- ▶ Use your equipment more efficiently
- ▶ Hand dryers or paper towels?

## Saving money with batteries

- ▶ Save power with your smartphone
- ▶ Be efficient with battery-charged equipment

## Invest & save

- ▶ Do you really need new equipment?
- ▶ How to work out the running costs of equipment you buy
- ▶ How the 'Energy Rating' label can save you money
- ▶ Look for the ENERGY STAR® label
- ▶ Save money in the workplace kitchen

## **Big energy eaters – can you save money on these?**

- ▶ **Be efficient with motors**
- ▶ **Save money with pump systems**
- ▶ **Cut the cost of compressed air equipment**
- ▶ **Do you need ‘power factor correction’?**

# No cost/low cost

## Do an equipment energy audit

Your existing equipment represents a significant investment. As with all investments, you need to maximise your return.

One way to do this is to create an inventory of the equipment in your business and make a note of how much energy it uses.



Appendix F of the 'Energy Reduction Plan' template is a table where you can write down what equipment you have and how much energy it uses. Download the template here:

[EnergyCut.info/erp-template](https://www.energycut.info/erp-template)

Once you have this information, you can:

- try and reduce the energy used
- replace it with equipment that uses less energy.

### Auditing your office equipment

Equipment can account for 15–30% of the overall energy bill for many small office businesses.<sup>1</sup> The 'CitySwitch' program has a toolkit that helps you to audit your office equipment.

This can be downloaded from: [EnergyCut.info/cs-audit-toolkit](https://www.energycut.info/cs-audit-toolkit)

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*For many small office businesses, equipment can be responsible for 15-30% of their overall energy bills.<sup>2</sup>*

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1 Source: CitySwitch 'Energy Audit Toolkit - Office Equipment' - [EnergyCut.info/cs-audit-toolkit](https://www.energycut.info/cs-audit-toolkit)

2 Source: [CitySwitch.net.au](https://www.cityswitch.net.au)



A larger printer or photocopier shared by many people is generally more energy efficient than several smaller machines used by a few.

But bigger isn't always better – laser printers, for instance, can use up to 50% more energy than an ink-jet printer.<sup>3</sup>

Do the research and choose what best meets your needs:



- For many small businesses, a multifunction printer (MFP) is ideal as it combines the ability to print, fax, scan and photocopy. In the past, that would have required four different machines, but today you can get it all in one unit.
- Staff in some companies use desktop computers when they're at work and take laptops with them when they're on the road. Consolidate this and only buy laptops. They're cheaper to buy and use a lot less energy.
- You don't have to buy an answering machine for your mobile, so why get one for the landline? Just use the voicemail service that's available from your landline provider. This will save on the purchase and running costs of an answering machine.
- Do you need a landline and the cost of associated handsets? Many households no longer use a landline, relying instead on their mobile phones. If you're a small business with few employees, could you do the same? You can still have a general number for your business through online services such as Skype<sup>4</sup> – just have the calls forwarded to a mobile phone.<sup>5</sup> If you do this, make sure you terminate any handset rental fee with your landline phone provider.

<sup>3</sup> [EnergyCut.info/hp-equipment](http://EnergyCut.info/hp-equipment)

<sup>4</sup> [EnergyCut.info/setting-up-skype-number](http://EnergyCut.info/setting-up-skype-number)

<sup>5</sup> [EnergyCut.info/skype-call-forwarding](http://EnergyCut.info/skype-call-forwarding)

## Maintain your equipment

It pays to keep your equipment well-maintained, as this maximises its ongoing energy efficiency and cost-effectiveness.

For small-to-medium-sized businesses, maintenance doesn't just have to apply to office and HVAC equipment; it should apply to whatever equipment is critical to your business operations.

### Fresh & Clean Uniform Services, NSW

Fresh & Clean regularly audit all of their steam equipment to ensure that it is functioning properly and not wasting energy. Anything inefficient is replaced or repaired.

They also entered a maintenance contract for their gas-fired boilers to monitor the combustion chambers on a quarterly basis. This ensures that they don't use more gas than necessary.<sup>6</sup>

## Switch off and save

At the end of the working day, many businesses leave on equipment such as photocopiers, computers, printers, water-coolers, vending machines and urns.

Wherever possible, you should turn off unused equipment at the powerpoint. This will save you on standby energy costs. To find out more, check the advice in 'Step 6 - Switch off and save'.

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<sup>6</sup> Source: DoSomething!





### Reducing the standby energy costs of your equipment

Some multifunction devices can use up to 50 watts per hour in standby or low power mode – that's enough to power six LED lights or four CFL globes.<sup>7</sup> However, some MFDs can use less than one watt in standby mode.<sup>8</sup>

Given that printers and photocopiers can remain idle up to 95% of the time,<sup>9</sup> it's important to choose equipment that has the lowest possible standby energy use.

### Use your energy settings

Activating power-saver modes on your equipment will reduce energy use when it's idle. Refer to your user manuals to see how to activate these power-management features.

Most manuals are now available in PDF format. If you've misplaced an equipment manual, then type the make, model number and the word 'manual' into a search engine. This should help you to locate the manual and your power-saver settings.



## Reorganise the placement of your equipment

Sometimes, equipment is placed in an area that makes it use more energy than necessary:

- Printers, photocopiers, water-coolers, fridges and other office equipment all generate heat, which adds to your air-conditioning costs. Are you able to move your low-use office equipment like photocopiers and printers to a room that is naturally cooled and well-insulated? If you can, you could reduce your air-conditioning cooling costs.

<sup>7</sup> This statistic is based on a 8W LED light and an 11W CFL globe

<sup>8</sup> Source: HP

<sup>9</sup> [EnergyCut.info/nra-office](http://EnergyCut.info/nra-office)

- You can save energy by ensuring that your thermostats and refrigeration equipment are moved away from heat sources. When you put a fridge in direct sunlight or next to heat-producing equipment, it will end up using more energy to keep itself cool.
- Locating hot water tanks too far from where the water is being used can waste hot water and the energy used to heat the water.
- Locating air compressors too far from the appliances that use them can increase the energy use.

Can you reduce your energy bills by moving your equipment to more optimal locations?

## Use your equipment more efficiently

Doing lots of small photocopying jobs throughout the day is not energy efficient.

From a money-saving perspective, it's best to save up all the jobs and do the photocopying in large batches. This will use less energy per page.<sup>10</sup>

Can you use your current equipment in a way where you get efficiencies like this?



### Do you need a photocopier anymore?

With the growth of iPads and other tablets, many people are now reading documents onscreen. Given the number of people who also use large computer monitors, do you still need to make copies at all?

Getting rid of a photocopier removes the leasing, air-conditioning and energy costs associated with the machine. It will also reduce your paper purchasing costs. If you currently post photocopied documents, going paperless will also reduce your postage bills.

<sup>10</sup> Source: Ausgrid 'Becoming an energy efficient business' – [EnergyCut.info/ausgrid-report](http://EnergyCut.info/ausgrid-report)



## Hand dryers or paper towels?

Every business has restrooms for employees. A key issue that many companies wrestle with is whether they should use paper towels or hand dryers.

### Austin Health, VIC

Dyson Airblade™ claim that their hand dryers cost up to 69% less to run than other hand dryers, and up to 97% less than paper towels.<sup>11</sup>

Austin Health has installed over 50 Dyson Airblade™ hand dryer units in the public access areas of Austin Hospital, Heidelberg Repatriation Hospital and the Olivia Newton-John Cancer & Wellness Centre.

The Dyson Airblade™ hand dryer was chosen because of the unit's energy efficiency and low running costs. It dries hands in 10 seconds instead of the 28-second average and it only uses one watt on standby instead of three watts.

“In the first twelve months, Austin Health achieved financial gains of over \$122,000 in paper towel cost savings, with projected savings expected to total over \$612,000 in just five years,” said Austin Health's Cleaning and Waste Manager, Ray Sedgwick. It also reduced their waste volume by approximately 1,217 wheelie bins per annum.

As a result of the Dyson Airblade's™ introduction into the marketplace, other brands have moved to change the design of their products. When assessing an upgrade in this area, check on the running costs of the hand dryers as these will give you a better idea as to the real cost of the product.<sup>12</sup>



<sup>11</sup> For calculations visit [www.dysonairblade.com.au/calcs](http://www.dysonairblade.com.au/calcs)

<sup>12</sup> [EnergyCut.info/austin-health-dyson](http://EnergyCut.info/austin-health-dyson)

# Saving money with batteries

## Save power with your smartphone

It's bad for business when you're out and about and your phone battery dies.

To make your batteries last longer and save on recharging costs, check your settings. If you only need to receive text messages and phone calls, turn off 3G and 4G. If you don't need them, make sure you turn off Bluetooth, GPS and WiFi as these use up a lot of battery power.

On some smartphones, you can install apps that monitor the apps that use up the most battery power. You can also download and use 'application killers' that stop unused applications from running in the background.



## Be efficient with battery-charged equipment

Business people in Australia use rechargeable batteries every day. It's what keeps our mobile phones, portable phones, laptops, digital cameras and tablets alive.

Over 15 million products with battery chargers are sold in Australia every year.<sup>13</sup> With the increasing business usage of laptops, tablets and smartphones, battery use will also increase.

When recharging this equipment, unplug it after it is fully charged. Some rechargers can still use power after the equipment battery has been fully charged.

<sup>13</sup> Page 3 E3 Product Profile Battery Chargers - EnergyCut.info/E3-battery-chargers



### How much money could be saved with battery recharging?

A 2013 government report stated that energy efficiency improvements in battery chargers could save Australians over a billion dollars over 10 years.<sup>14</sup> With over 75 million battery recharger systems around Australia currently in use, it makes sense to be as efficient as possible in this area.

To find out more about maximising energy efficiency for battery chargers, visit: [EnergyCut.info/E3-battery-chargers](https://EnergyCut.info/E3-battery-chargers)

### Linfox, VIC

Forklift batteries are not cheap. As such, it makes sense to maximise their service life.

At Linfox, forklift trucks use deep-cycle batteries that do not need to be recharged until they reach 80 per cent depth of discharge. However, at the end of each shift, some sites used to 'shallow charge' before they reached this level.

'Shallow charging' these type of batteries can reduce their service life. As part of the company's LeanFox efficiency initiative, forklifts are now operated until they are at maximum discharge and charged using a forklift battery charging system.

The battery recharging system also takes advantage of less expensive 'off-peak' power.<sup>15</sup>

### Buying rechargeable batteries

It makes financial sense to buy rechargeable batteries for office-based devices as some can be recharged up to 1,000 times. This can save you a significant amount of money on the purchase costs of single-use batteries. They can also be very convenient – some batteries can now be recharged in as little as 15 minutes.



As with all types of recharging, make sure that you turn off your battery charger at the plug when the batteries are fully charged. This prevents it using unnecessary power.

<sup>14</sup> Page 4 - [EnergyCut.info/E3-battery-chargers](https://EnergyCut.info/E3-battery-chargers)

<sup>15</sup> Source: Linfox

# Invest & save

## Do you really need new equipment?

When you feel it's time to purchase new equipment, ask yourself the following questions:

- Can your existing equipment be repaired?
- Can it be upgraded without buying a whole new unit?
- Is it cheaper to hire replacement equipment on an ad-hoc basis?
- How much energy does the existing equipment use? If it uses a lot, a new energy efficient model may save you so much that it justifies buying replacement equipment.
- If you do have to buy equipment, can you buy good quality second-hand or superseded equipment? Last year's top-of-the-range model from a respected brand could be more energy efficient than your current model and it should be cheaper to buy than the latest version.
- If you are buying new equipment, buy only the size that you need to get the job done. Buying equipment that's too big will unnecessarily increase your energy bills.
- When buying new equipment, make sure you buy the most energy efficient model available. This will reduce your ongoing running costs.

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*Sometimes the most business-friendly purchase is not to purchase at all! When it comes to new equipment, buying only what you need is the first step to saving money.*

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## How to work out the running costs of equipment you buy

Many small businesses buy cheap equipment as the upfront cost is cheaper. If you follow this approach, it can end up being a false economy for your business – the equipment may be very cheap to buy, but it could actually be very expensive to run.



If the equipment you're buying does not have an ENERGY STAR® label, you can still work out whether it will be expensive or economical to run.

Take these steps:

- 1) Before you buy, make a shortlist of the equipment that you're interested in. Don't just include the cheapest equipment on this list. You should also include more expensive equipment that claims to be energy efficient or has an ENERGY STAR® label.
- 2) Find out from the equipment vendors how many 'watts' of energy their equipment uses. You can use this information to calculate the lifetime running costs.

This is how you work it out:

- 1,000 watts is a kW. If the equipment uses 2,000 watts per hour, this equals 2kWh.
  - If your electricity company charges you 30 cents per kWh, a 2kWh product will cost you 60 cents an hour to run.
  - Using the equipment eight hours a day will cost you \$4.80 a day.
  - Using it 250 days a year will cost you \$1,200.<sup>16</sup>
  - Over 10 years, the equipment will cost you \$12,000 in electricity.
- 3) Add the lifetime running costs to the purchase price, and you have the true cost of buying the equipment.
  - 4) Use this formula to compare the equipment costs before you buy. It can save you a lot of money as the cheap-to-buy equipment will often be more expensive once you take its running costs into account.

<sup>16</sup> To get a more accurate costing, work out how many hours a year you will be using the equipment, then give this figure to the manufacturer. They will then be able to tell you how long the equipment will last and how much the lifetime running costs will be.

## How the 'Energy Rating' label can save you money

You'll find an 'Energy Rating' label on every TV, computer monitor, air conditioner, clothes dryer, dishwasher, washing machine, refrigerator and freezer currently sold new in Australia.

When buying electrical appliances for your office or home-based business, make sure you buy the models with the most efficiency stars on them. More stars mean more energy savings.

By going to [EnergyCut.info/energy-rating-gov](https://EnergyCut.info/energy-rating-gov), you can see how many stars an appliance has and you can compare the running costs of different appliances. This section will show you how much you can save.

- ▶ **More stars equals more savings**
- ▶ **How to calculate the lifetime running cost using the 'Energy Rating' label**
- ▶ **Air conditioners**
- ▶ **Fridges and freezers**
- ▶ **Dishwashers**
- ▶ **TV sets**
- ▶ **Washing machines**
- ▶ **Clothes dryers**

### Stradbroke Bakery, QLD

Stradbroke Bakery replaced their old two-burner traveller oven with a new fan-forced single burner oven that cuts their LPG usage in half. This saved 26,390L of LPG every year, saving the business around \$26,390 per annum.

The change was implemented by then owner Gloria Jones. When it comes to buying new equipment, she said that "you shouldn't look at the actual retail prices, but rather at the usage numbers. Some appliances might seem very expensive on first sight, but when you calculate their energy efficiency, they can reduce your energy bill remarkably."<sup>17</sup>

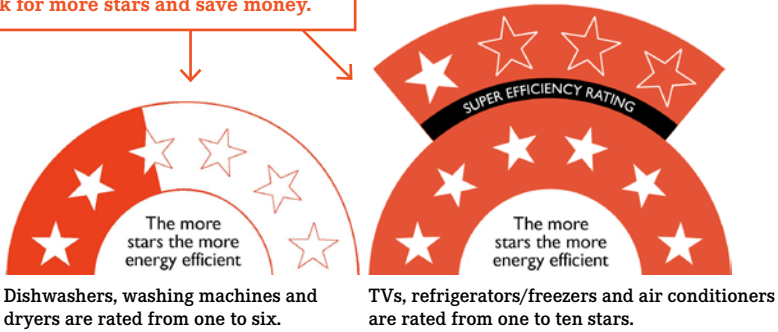
<sup>17</sup> Source: [EnergyCut.info/stradbroke-bakery-qld](https://EnergyCut.info/stradbroke-bakery-qld)





## More stars equals more savings

When comparing similar sized products look for more stars and save money.



When buying new equipment, you need to know how many rating stars are used on each type:

- Dishwashers, computer monitors, washing machines and dryers are rated from one to six stars.
- TVs, refrigerators/freezers and air conditioners are rated from one to 10 stars.

Regardless of whether the equipment goes up to six stars or 10 stars, when it comes to 'Energy Rating' labels, remember that more stars equals more savings.<sup>18</sup>

## How to calculate the lifetime running cost using the Energy Rating label

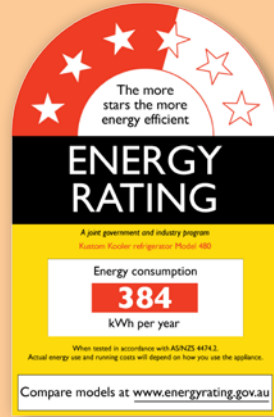
If you're in a store buying an appliance and you can't access the internet, then you won't be able to access the comparison ratings on [EnergyCut.info/energy-rating.gov](http://EnergyCut.info/energy-rating.gov). If this happens, then the 'Energy Rating' label itself can tell you the lifetime running cost of the appliance.



<sup>18</sup> This graphic is adapted from Sustainability Victoria 'How much will that appliance really cost you?' [EnergyCut.info/SV-running-costs](http://EnergyCut.info/SV-running-costs). Licensed under a Creative Commons Attribution 3.0 Australia

### How to calculate the lifetime running cost:

- 1) Look at the middle of the label where it tells you the 'energy consumption kWh per year'.
- 2) Multiply this kWh figure by 30 cents, and it will give you an idea of the annual running costs. If it says 400kWh per year, then the annual running cost is  $400 \times 30 \text{ cents} = \$120 \text{ pa}$ .
- 3) Multiply this annual figure by 10 years to get the approximate lifetime running cost of the appliance. If it's \$120 per year, then it would be \$1,200 over 10 years.



### What's the 'true cost' of the appliance?

It's important to add this 10-year running cost figure to the purchase price. This will give you the 'true cost' of the appliance.

You'll often find that the more expensive energy efficient equipment will cost you far less in the long run than the cheaper model.

Although energy efficient equipment sometimes requires a greater financial investment initially, this pays off over the life of the product due to reduced running costs.

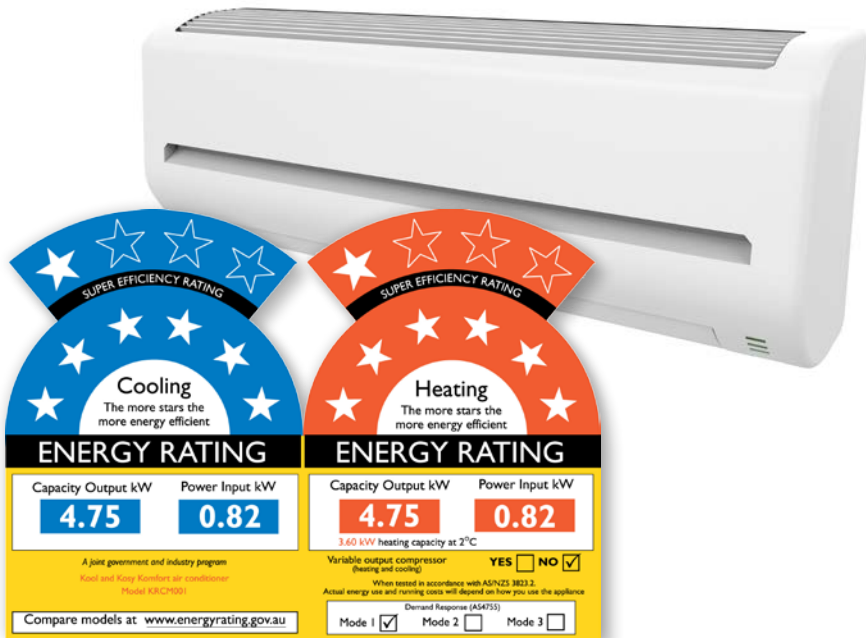
Use the above method to compare the running costs of the different models on display at the store. You can then buy the model that will save you the most money over its lifetime.

**Many businesses use domestic equipment in their operations. Use an independent advice service such as CHOICE to research this equipment before purchasing it.**

See [www.choice.com.au](http://www.choice.com.au)



## Air conditioners

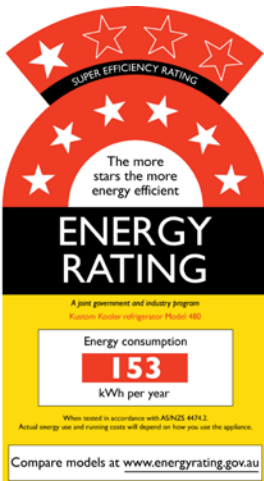


- Every extra star on an air conditioner can reduce your running costs by up to 10%.<sup>19</sup>
- The star rating for air conditioners can go as high as 10 stars.
- The blue stars show you how efficient the machine is at cooling. If you have a reverse-cycle system, it will also show you red stars – these rate how efficient it is at heating.
- To compare the running costs of new air conditioners, go to [EnergyCut.info/aircon-ratings](https://www.energyrating.gov.au)
- For more details go to ‘Step 9 - Lower your heating, ventilation and air-conditioning costs’.

<sup>19</sup> Source: Sustainability Victoria

## Fridges and freezers

- Every extra star on your fridge and freezer will save you up to 23% on its energy costs.<sup>20</sup>
- The energy star rating system now recognises refrigerators/freezers, that are 'super-efficient'. As a result, these appliances now show a rating out of 10 stars rather than the usual six.
- Many businesses use domestic fridges and freezers in their operations. To compare their running costs before you buy, click here: [EnergyCut.info/fridge-ratings](http://EnergyCut.info/fridge-ratings)
- When buying a two door fridge, chest freezer or upright freezer, the NSW OEH recommend that you should look for a unit with 3 stars. They also advise that chest freezers are more energy efficient than upright models.
- Other energy efficiency attributes to look out for are easy to read thermostat controls, adjustable defrost, inverter technology and a door alarm.
- You should also buy a unit that's just the right size for your operations. Don't buy a unit that's too big as it will use more energy than you need it to.



<sup>20</sup> Source NSW OEH: [EnergyCut.info/nsw-fridges-freezers](http://EnergyCut.info/nsw-fridges-freezers)



## Dishwashers

- Every extra star on a dishwasher will save you water and reduce your running costs by 30%.
- When buying a dishwasher, look for one with at least 3.5 stars. A 4 star dishwasher can use half the energy of a 2 star dishwasher.<sup>21</sup>
- If your business has a time-of-use tariff, get a delay-start dishwasher that can turn itself on during cheaper off-peak times at night.
- You should only use dishwashers when they're full. Where possible you should also get a unit with an 'Economy Wash' or 'Eco' setting (an 'Eco' setting is usually where the machine uses less water or washes in cooler water).
- Keeping the filters clean helps the appliance to run at maximum efficiency and reduces the risk of the machine breaking down.
- Many businesses use domestic dishwashers in their operations. To compare their running costs before you buy, click here:

[EnergyCut.info/dishwash-ratings](https://www.energycut.info/dishwash-ratings)

**According to the NSW OEH, over a 10 year period, a 2 star rated dishwasher will cost up to \$770 more to run than a 4 star rated model.<sup>22</sup>**



### WT Sustainability (WTS), NSW

WTS selected their appliances, such as fridges and microwaves, for their energy efficiency. They also replaced the instantaneous hot water unit with a kettle to save on hot water energy costs. They also instructed staff to only heat the required amount of hot water each time they boiled the kettle.<sup>23</sup>

<sup>21</sup> Source: The statistics from the first two points are from the NSW OEH

<sup>22</sup> Sourced from the NSW OEH: [EnergyCut.info/dishwasher-leaflet](https://www.energycut.info/dishwasher-leaflet)

<sup>23</sup> Source: [EnergyCut.info/WT-Sustainability](https://www.energycut.info/WT-Sustainability)

## TV sets

- Every extra star on a new TV will save you up to 20% in running costs.<sup>24</sup>
- When buying a TV, look for an energy efficient LCD/LED model, instead of a plasma TV. They use less energy.
- If you buy a TV set for your business, get one with at least five stars. However, there are now super-efficient 7-10-star TV sets on the market.
- To compare the running costs of TV sets click here: [EnergyCut.info/TV-ratings](http://EnergyCut.info/TV-ratings)



**Buying a 7 star (106cm) LCD TV instead of a 1.5 star TV can save you up to \$157 per year. Over 10 years, that's a saving of \$1,570 in running costs.<sup>25</sup>**

## Washing machines

- Washing machine star ratings go up to six stars. It's best to get one with at least 3.5 stars.
- On a warm cycle, every extra star on a washing machine could reduce your energy running costs by 27%.<sup>26</sup>
- The label also tells you how much energy is used when you use hot or cold water.
- A 1.5 star 8kg capacity top loader used once a day on a warm cycle can cost \$250 per year to run.<sup>27</sup>



<sup>24</sup> Source: [EnergyCut.info/nsw-washer-dryers](http://EnergyCut.info/nsw-washer-dryers)

<sup>25</sup> Based on a 30 c/kWh comparison of equipment listed at [EnergyCut.info/energy-rating-gov](http://EnergyCut.info/energy-rating-gov)

<sup>26</sup> Source: [EnergyCut.info/nsw-washer-dryers](http://EnergyCut.info/nsw-washer-dryers)

<sup>27</sup> Based on a 30 c/kWh comparison of equipment listed at [EnergyCut.info/energy-rating-gov](http://EnergyCut.info/energy-rating-gov)



- A 4.5 star 8kg capacity front loader doing the same wash would cost only \$66 a year to run.<sup>28</sup>
- Using this front loader instead of the top loader could save \$184 per year - over 10 years that's \$1,840.
- Washing in cold water increases these savings even further. When you wash clothes in cold water instead of hot water, you reduce your energy costs by up to 80–90%. It's an easy way to save a lot of money.
- Front loaders can also use about half the water of top loaders, so you can save money there too. If you're getting a machine, make sure it has at least a 4 star water rating.
- Many small businesses use domestic washing machines in their operations. To compare their running costs before you buy, click here: [EnergyCut.info/washing-ratings](https://EnergyCut.info/washing-ratings)

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*Washing linen and clothes in cold water can reduce your energy running costs by up to 80–90%. When you are installing a washing machine, attach it to the cold tap only.<sup>29</sup>*

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#### Download The Energy Rating App

If you want to find out the running costs of the appliances at [EnergyRating.gov.au](https://EnergyRating.gov.au), you can now do so with The Energy Rating App. It's available free of charge and it runs on iPhone®, iPad®, iPod touch®, Android™ and Windows Phones.

- The download links are available at [EnergyCut.info/energy-ratings-mobile](https://EnergyCut.info/energy-ratings-mobile)
- You can watch the video at [EnergyCut.info/energy-rating-video](https://EnergyCut.info/energy-rating-video)

<sup>28</sup> Based on a 30 c/kWh comparison of equipment listed at [EnergyCut.info/energy-rating-gov](https://EnergyCut.info/energy-rating-gov)

<sup>29</sup> You should only wash in hot water if there are health reasons to do so - such as getting rid of bed bugs from hotel sheets. Some brands of laundry detergent have been specially formulated to wash in cold water - this means that you no longer need to wash linen and clothes in hot water.

## Clothes dryers

- Every extra star on a dryer reduces running costs by 15%.<sup>30</sup>
- Using a 1.5-star rated 7kg vented dryer can be expensive! Used once a day, one brand can cost you up to \$695 per year. That's approximately \$1.90 per load.<sup>31</sup>
- Using an efficient 6-star 7kg condenser heat pump dryer can be far cheaper to run. Used once a day, one brand can reduce that cost down to \$229 per year. That's a reduction of \$466 per year. Over 10 years, that's a saving of \$4,660. If you're drying more than one load a day, the savings will be even bigger still.<sup>32</sup>
- You can save money by getting a dryer with an auto-sensor - this avoids over-drying your clothes and uses less energy.
- Many small businesses use domestic clothes dryers in their operations. To compare their running costs before you buy, visit:  
[EnergyCut.info/dryer-ratings](https://www.energycut.info/dryer-ratings)
- Heat pump and gas dryers are much less expensive to operate (though they are more expensive to buy upfront). For more information about these types of systems, check out the Sustainability Victoria information page at [EnergyCut.info/heatpumps-gasdryers](https://www.energycut.info/heatpumps-gasdryers)



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***If you use a clothes dryer once a day,  
using the clothes line instead could save  
you hundreds of dollars a year.***

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<sup>30</sup> [EnergyCut.info/clothes-dryers-ratings](https://www.energycut.info/clothes-dryers-ratings)

<sup>31</sup> Based on a 30 c/kWh comparison of equipment listed at [EnergyCut.info/energy-rating-gov](https://www.energycut.info/energy-rating-gov)

<sup>32</sup> Based on a 30 c/kWh comparison of equipment listed at [EnergyCut.info/energy-rating-gov](https://www.energycut.info/energy-rating-gov)





### **Use the clothes line – it's free!**

Many hairdressers, care facilities, gyms and holiday parks use clothes dryers in their operations. Unfortunately, this can cost a lot of money.

However, drying linen and clothes on a clothes line costs nothing. Where possible you should dry them on a covered all-weather outside line or on an indoor clothes line.<sup>33</sup>

In winter, you can reduce drying costs by giving the clothes an extra spin in the washing machine. You can also hang them out and if they're still damp, just finish them off in the dryer for 15 minutes.

Both approaches can significantly reduce the energy bills from your clothes dryer.

### **Boronia Veterinary Clinic & Hospital, VIC**

Veterinary clinics have very busy laundries, so one less load of washing in the dryer per day can make a big difference to energy efficiency, according to Boronia Vet Clinic. Their nurses campaigned for the return of the hills hoist - a modest step to reduce their dependency on gas dryers and a guaranteed way to save money.<sup>34</sup>



<sup>33</sup> See All Weather Clothes Line [EnergyCut.info/clothes-line](http://EnergyCut.info/clothes-line) or call Gunns Clothesline 1300 941 321.  
See also indoor lines at [EnergyCut.info/spacesaver-dryer](http://EnergyCut.info/spacesaver-dryer)

<sup>34</sup> [EnergyCut.info/boronia-vet-clinic](http://EnergyCut.info/boronia-vet-clinic)

## Look for the ENERGY STAR® label

When buying new equipment for your business, look for products with the ENERGY STAR® label – this is the international standard for energy efficient electronic equipment.

Products with the ENERGY STAR® label have been subject to independent testing, third-party review and compliance screening. This gives businesses confidence that products with an ENERGY STAR® label will deliver the energy savings promised.

Searching the ENERGY STAR® database can give you information about the energy efficiency of equipment you need to buy. It also enables you to compare up to four products based on energy efficiency criteria.

Sixty-five different product categories are covered in their searchable database which can be accessed via: [energystar.gov/productfinder](http://energystar.gov/productfinder)



### How much money has ENERGY STAR® saved?

**4.5 billion products with the ENERGY STAR® label have been sold over the past 20 years. In America alone, products with the label have helped businesses and households to reduce their energy bills by US\$239 billion.<sup>35</sup>**

**Buying equipment with the ENERGY STAR® label can save your business significant amounts of energy and money.**

## Further information

The ENERGY STAR® scheme has a useful guide that helps businesses to purchase energy efficient products:

[EnergyCut.info/purchasing-guide](http://EnergyCut.info/purchasing-guide)

They also have other useful tools and resources at this page:

[EnergyCut.info/energy-star-tools](http://EnergyCut.info/energy-star-tools)

<sup>35</sup> Statistics on this page have been sourced from [EnergyCut.info/energy-star-about](http://EnergyCut.info/energy-star-about)



## Products and equipment covered by the ENERGY STAR® product finder

Audio/Video	Boilers	Ceiling Fans	Commercial Clothes Washers
Commercial Dishwashers	Commercial Fryers	Commercial Griddles	Commercial Hot Food Holding Cabinets
Commercial Ice Machines	Commercial Ovens	Commercial Refrigerators and Freezers	Commercial Steam Cookers
Commercial Water Heaters	Computers	Cordless Phones	Dehumidifiers
Displays	Enterprise Servers	Furnaces	Geothermal Heat Pumps
Imaging Equipment	Light Bulbs	Light Commercial HVAC	Light Fixtures
Pool Pumps	Residential Clothes Washers*	Residential Dishwashers*	Residential Freezers*
Residential Refrigerators*	Roof Products	Room Air Cleaners	Room Air Conditioners*
Set-Top Boxes	Small Network Equipment	Televisions*	Uninterruptible Power Supplies
Vending Machines	Ventilating Fans	Water-coolers	Water Heaters

\* It is better to use the Australian Government's [EnergyCut.info/energy-rating.gov](https://www.energy.gov.au/energy-rating.gov) searchable database for these products.

## Request ENERGY STAR® labelled products when buying new equipment

Although the ENERGY STAR® website is American, many products on their product finder database can be bought in Australia.



When buying equipment, specify to vendors that the products they're quoting on should ideally have:

- earned an ENERGY STAR® label
- met ENERGY STAR® specifications for energy efficiency.

### What if an Energy Star® label product is not available in Australia?

If the product you want is not available in Australia, ask your vendor if they sell products that match the energy efficiency levels of the best performing products at [energystar.gov/productfinder](https://energystar.gov/productfinder)

The database will show your vendors the energy savings that are possible with the product that you're seeking to buy.

Asking your vendors to match the energy efficiency performance of the best ENERGY STAR® products could save you a lot of money.

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*In the last 20 years, the ENERGY STAR® label has helped Americans to reduce their energy bills by US\$239 billion.*

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## Save money in the workplace kitchen

In most small- to medium-sized businesses, the core equipment in the workplace kitchen consists of a kettle (or urn), fridge, freezer and microwave.

Simple energy savings can be made here that will contribute to reducing your bills:



- If you use an urn or instant hot water unit, use an appliance monitor to measure how much energy it uses. You may find that you'll save energy and money by switching to a kettle.
- When using a kettle, only boil the amount of water that you're going to use, rather than a whole kettle full.
- Use plug timers for urns, vending machines, drinks fridges and water-coolers so they are not using power at night and on weekends. When it comes to urns this can save a significant amount of money.
- Switch off microwaves at the plug when not in use.

### Larger scale kitchens

For small businesses whose core business is the preparation of food, there are significant savings to be made from developing energy efficient habits.

Ausgrid has identified 10 easy changes that you can implement straight away:

- 1) Turn off equipment when it's not being used.
- 2) Minimise the opening of oven doors. Every time you open the door you lose 4% of the heat. That can really add up.
- 3) Reduce heat wastage by preheating ovens only when you need to.
- 4) When opening the business for the day, leave it till as late as possible to turn on your ovens and other equipment.
- 5) Don't over-do your heat settings. Many kitchens keep their equipment on a high setting all day and waste money as a result. This equipment should be run on low settings as much as possible, especially during quieter periods.

- 6) Use your lids to keep in the heat and don't overfill your pots with water. Just using the amount needed to cook the food will save you energy.
- 7) Think small when choosing your equipment. Sometimes an electric fry pan or microwave can cook a dish faster and use less energy than a large conventional oven.
- 8) Keep your equipment in good working order. Check oven and fridge door seals regularly to prevent heating or cooling losses.
- 9) Maintain a set of pots and pans with flat bases and correctly-fitting lids to transfer heat effectively and minimise heat loss.
- 10) Exhaust hoods can be turned off or put on to low during quieter periods.

Longer term, you should think about investing in the following to save even more money:

- Look out for equipment that is insulated to keep in heat.
- Old energy-guzzling dishwashers should be replaced with newer, energy efficient models. The savings can be significant.
- When buying commercial ovens, exhaust hoods, commercial dishwashers, refrigerators or other kitchen equipment, choose energy efficient models. You can compare the energy efficiency of different commercial kitchen products at [EnergyCut.info/energy-star-product-finder](https://www.energycut.info/energy-star-product-finder).

## More information on energy saving in commercial kitchens

If you run a business with a commercial kitchen, more details about energy-saving equipment can be found at the following Energy Cut website: [EnergyCut.info/restaurants-and-cafes](https://www.energycut.info/restaurants-and-cafes)





## Big energy eaters – can you save money on these?

### Be efficient with motors

It's surprising how many types of equipment use motors. They're everywhere – in your microwave, air conditioner, fridge, air compressors, pumps and exhaust fans. According to Ausgrid, three-phase motors could be responsible for up to 40% of the total electricity consumed by commercial and industrial businesses in Australia.<sup>36</sup>



The annual cost of operating an electric motor can be 10 times the purchase price.<sup>37</sup> That's why it makes business sense to:

**Turn them off** - Reducing the running costs of your existing motors can be as simple as turning them off when they're not in use.

**Get advice** - If your business uses a large number of motors, you should bring in a motor specialist or EcoSmart Electrician to audit your existing set-up. They can:

- show you how to improve the efficiency and running costs of your existing motors
- maintain your motors to maximise their ongoing efficiency
- advise you on whether you need to upgrade your motor set-up.

**Optimise your system** - An expert can help to optimise the way that motors are being used in your business from a 'whole-of-system' approach. When you optimise motor-driven systems and implement best-practice motor management and maintenance, savings of 30–60% can be achieved.<sup>38</sup>

<sup>36</sup> Source: Page 13 Ausgrid 'Becoming an energy efficient business' report

<sup>37</sup> Source: Department of Industry and Science

<sup>38</sup> Source: Department of Industry and Science

**Buy the most efficient motor(s) possible** - According to Ausgrid, a high efficiency motor can have an efficiency of around 80-96%. However, many small, poor quality motors for items such as exhaust fans, can have efficiencies as low as 50%. Low efficiency motors means higher running costs and higher bills.

A motor specialist or EcoSmart Electrician can advise you on motor purchases.

- ▶ **Motor maintenance**
- ▶ **Minimising motor losses**
- ▶ **How to buy the most efficient electric motor**
- ▶ **The benefits of installing variable speed drives on motors**
- ▶ **More information on electric motors**

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***The annual cost of operating an electric motor can be 10 times the purchase price.<sup>39</sup>***

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## **Motor maintenance**

Having the right motor for the job and maintaining it properly is critical as this maximises efficiencies:

- Fan-cooled motors can accumulate dirt and grease.
- Misaligned motors will create excessive vibration.
- Inadequate ventilation will make the motor run hot.
- Loose connections, overheating and lack of proper lubrication can all negatively impact on motor performance.



<sup>39</sup> Source: Department of Industry and Science





Given that motors can be expensive to run, having them maintained properly will save you money. It's estimated that proper maintenance can improve the efficiency of a motor by 10–15%.<sup>40</sup>

To find out more about motor maintenance, visit: [EnergyCut.info/motor-maintenance](https://www.energycut.info/motor-maintenance)

**Up to 95% of a motor's costs can be attributed to the energy it consumes over its lifetime, while only about 5% are typically attributed to its purchase, installation and maintenance.<sup>41</sup>**

## Minimising motor losses

Inefficient motors and motor equipment can waste a great deal of energy, which will impact on your bottom line:

- Get your expert to ensure that your motors are operating as efficiently as possible with a 'whole-of-system' approach.
- Before you buy or lease any new motors, get expert advice. Knowing the future running costs of motors is critical when it comes to reducing the running costs of motors within your business.



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***On average, motor systems lose around 55% of their input energy before reaching the end-use work<sup>42</sup>***

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<sup>40</sup> [EnergyCut.info/motor-maintenance](https://www.energycut.info/motor-maintenance)

<sup>41</sup> Sourced from: Page 23 'An ENERGY STAR® Guide for Identifying Energy Savings in Manufacturing Plants' [EnergyCut.info/energystar-costs](https://www.energycut.info/energystar-costs)

<sup>42</sup> Quote sourced from the Department of Industry and Science's [eex.gov.au](https://www.eex.gov.au): [EnergyCut.info/motor-losses](https://www.energycut.info/motor-losses)

## How to buy the most efficient electric motor

When it comes to buying energy efficient electric motors, a motor specialist or EcoSmart Electrician can give you good advice.

The EnergyRating.gov.au website also enables you to compare the efficiency of electric motors currently sold on the Australian market.

For more information, visit: [EnergyCut.info/electric-motors-comparison](https://EnergyCut.info/electric-motors-comparison)



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*The average electric motor uses  
50 times its initial cost in electrical energy  
over a 10–15-year life<sup>43</sup>*

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## The benefits of installing variable speed drives on motors

If you have a continuous operation with a consistent load, then a 'direct on line' (DOL) motor will be appropriate for your business.

However, if you have equipment such as pumps, fans, precision tools and winders that have variable loads, then you need to use a 'variable speed drive' (VSD).

These drives can adjust the speed of a motor to match the size of the load or task at hand. This is far more efficient than using a motor that has a constant single speed.



*Variable Speed Drive with motor kit*

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<sup>43</sup> Quote sourced from eex.gov.au: [EnergyCut.info/eex-compressed-air-motors-drives](https://EnergyCut.info/eex-compressed-air-motors-drives)



Installing a variable speed drive in a motor can pay for itself very quickly. Dropping the speed of a motor by 10% can reduce its energy consumption by up to 25%.<sup>44</sup> This flexibility enables the motors to use less energy which saves money.

An EcoSmart Electrician or motor expert can give you advice on the VSD options available to your business.

## More information on electric motors

**Australian Industry Group:** The Australian Industry Group has an excellent video and education module about motor and drive energy efficiency. If your business relies on motors, their 'Energy Efficiency Assist' program gives a very good overview on what you need to look out for and what you need to do: [EnergyCut.info/aig-motor-video](https://EnergyCut.info/aig-motor-video)



If your business is a manufacturing entity, you can also get electric motor and drive advice by contacting Ai Group's Environment and Energy Help Desk on 1300 733 752 or via [environment@aigroup.com.au](mailto:environment@aigroup.com.au)

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<sup>44</sup> Source: AIG Energy Efficiency Assist - [EnergyCut.info/aig-motor-video](https://EnergyCut.info/aig-motor-video)

# Save money with pump systems

Pumps are used in many SME business sectors. For the companies that use pumps as a core part of their business, there are major financial savings to be had by implementing energy efficiency measures:

- When you look at the lifetime running cost of pumps, the purchase price only accounts for up to 15% of the total lifecycle cost.<sup>45</sup>
- The running and maintenance costs of the pumping equipment account for 50-95% of the overall lifecycle cost.<sup>46</sup>
- Reducing the speed used for fixed loads can reduce running costs by 5-40%.<sup>47</sup>
- During normal operations, the efficiency of a pumping system can degrade by as much as 10-25% before it is eventually replaced. Pump system efficiencies of 50-60% or lower are common.<sup>48</sup>
- Replacing throttling valves with speed controls can reduce running costs by 10-60%.<sup>49</sup>
- Energy reductions of up to 30-50% can be achieved by changes in control systems or pump equipment.<sup>50</sup>

The above figures show that there are big opportunities to reduce the running costs of pumping systems. As such, it pays to use the services of a pump expert who specialises in a 'whole-of-system' approach to energy efficiency.



*End-suction pump*

<sup>45</sup> [EnergyCut.info/pump-systems](http://EnergyCut.info/pump-systems)

<sup>46</sup> From [EnergyCut.info/pump-systems](http://EnergyCut.info/pump-systems) and 'Good Practice Guide 249: Energy Savings in Industrial Water Pumping Systems', prepared by ETSU for the Department of Environment, Transport and Regions, USA.

<sup>47</sup> Source: Sustainability Victoria 'Best Practice Guide - Pumping Systems'

<sup>48</sup> Source: Sustainability Victoria 'Best Practice Guide - Pumping Systems'

<sup>49</sup> Source: Sustainability Victoria 'Best Practice Guide - Pumping Systems'

<sup>50</sup> Source: Sustainability Victoria 'Best Practice Guide - Pumping Systems'



The advice of these experts can reduce the amount of energy used by pumping systems and save a lot of money in the process.

### Ways to lower pump energy consumption<sup>51</sup>

Energy Savings Method	Savings
Replace throttling valves with speed controls	10-60%
Reduce speed for fixed load	5-40%
Install parallel system for highly variable loads	10-30%
Replace motor with a more efficient model	1-3%
Replace pump with a more efficient model	1-2%

*Energy reductions of up to 30-50% can be achieved by changes in control systems or pump equipment.<sup>52</sup>*

51 Table source: Sustainability Victoria 'Best Practice Guide - Pumping Systems'. Based on information from the Natural Edge Project, Whole System Design Suite - Unit 6 - Worked Example 1 Industrial Pumping Systems, prepared for Department of Environment and Water Resources, Australia, July 2007. [EnergyCut.info/nat-edge-pumps](http://EnergyCut.info/nat-edge-pumps)

52 Source: Sustainability Victoria 'Best Practice Guide - Pumping Systems'

## Alice Springs Reptile Centre, NT

The Alice Springs Reptile Centre installed a 'variable frequency drive' (VFD) on a 1.5 Hp pool pump at their heated crocodile pool.

This reduced the pump's energy use by 62% and led to an annual energy saving of \$1,409.



The 'plug 'n play' FutureWave Energy Saver VFD that brought about this saving only cost \$964. This gave the project a payback period of only eight months.

Installing this new VFD also led to less wear and tear on the pump and it significantly reduced pump noise levels.

The other benefit is that as electricity prices go up, the annual \$1,409 saving will also increase.

## More information on pumps and energy efficiency

The 'Best Practice Guide – Pumping Systems' report by Sustainability Victoria, is the definitive guide to reducing the energy usage of pumping systems. It shows businesses how to:

- improve the efficiency of existing pumping systems
- design a new pumping system that maximises efficiencies and minimises running costs.

It also gives an excellent summary of design considerations for pumping systems and guidance on how to select a service provider.

If your business has pumping systems, you can download the report from:

[EnergyCut.info/sv-pumping-systems](https://EnergyCut.info/sv-pumping-systems)<sup>53</sup>

<sup>53</sup> The author would like to acknowledge Sustainability Victoria and the authors of this report. Most of the information in this 'Pump Systems' section is based on their work and the work of the Natural Edge project.



## Cut the cost of compressed air equipment

Compressed air has had a long history of use in the Australian business sector, but many people are unaware that it uses up a large amount of power.

Up to 10% of energy used by Australia's manufacturing sector goes on powering compressed air equipment and tools.<sup>54</sup>

With such significant and expensive energy use, there is a great deal of potential to save money through energy efficiency initiatives. This is important as many compressed air systems have a low energy efficiency and often leak.

When you optimise and upgrade your compressed air equipment and reduce compressed air usage, it's estimated that savings of 20–50% in running costs are achievable.<sup>55</sup>

- ▶ **Switch off air compressors and associated equipment**
- ▶ **Maintaining compressed air equipment**
- ▶ **Minimise leaks in your equipment**
- ▶ **Operating pressure and equipment placement**
- ▶ **Air intake temperature**
- ▶ **Equipment replacement**
- ▶ **Further information on compressed air equipment**

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<sup>54</sup> [EnergyCut.info/aig-compressed-air-video](https://EnergyCut.info/aig-compressed-air-video)

<sup>55</sup> [EnergyCut.info/eex-compressed-air-savings](https://EnergyCut.info/eex-compressed-air-savings)

## Switch off air compressors and associated equipment

When your compressor is idling, it's still using between 20-70% of the energy that it uses when operating at full load.<sup>56</sup>

This is a good reason to ensure that your air compressors and associated equipment are always turned off at the end of the working day.

Where possible, put your air compressor equipment on timers to ensure that it's only on when needed. If your team has lunch at the same time, turn it off at lunchtime too.



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*Energy costs involved in running a compressed air system can be more than 70% of a system's total cost over its lifetime<sup>57</sup>*

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<sup>56</sup> [EnergyCut.info/ct-compressed-air](https://www.energycut.info/ct-compressed-air)

<sup>57</sup> Source: [AIG EnergyCut.info/aig-compressed-air-video](https://www.energycut.info/aig-compressed-air-video). Image sourced from 'Compressed Air - opportunities for businesses' [EnergyCut.info/ct-compressed-air](https://www.energycut.info/ct-compressed-air)





## Maintaining compressed air equipment

The Australian Industry Group (AIG) estimates that the energy costs involved in running a compressed air system can be more than 70% of a system's total cost over its lifetime.<sup>58</sup>

To maximise savings, companies with compressed air equipment need to ensure that it's operating as efficiently as possible. Maintenance of the equipment is therefore vital. Research shows that energy savings of up to 10%<sup>59</sup> can be achieved through basic maintenance such as:

- checking for leaks
- maintaining the air cleaning system – this includes filters, dryers, valves and separators
- replacing air filters
- isolating or disconnecting any unused parts of your compressed air system
- applying lubrication and grease
- checking the tightness of the drive belts – if these are too tight or too loose, the compressor and the motor can use extra energy
- liaising with staff to see if they have noticed any drop in system performance.

A full maintenance checklist for compressed air systems is available from [EnergyCut.info/comp-air-maintenance](https://www.energycut.info/comp-air-maintenance)



<sup>58</sup> [EnergyCut.info/aig-compressed-air-video](https://www.energycut.info/aig-compressed-air-video)

<sup>59</sup> Source: Page 23 of 'Compressed Air - opportunities for businesses' [EnergyCut.info/ct-compressed-air](https://www.energycut.info/ct-compressed-air)

## Minimise leaks in your equipment

One of the most common causes of inefficiency is air leaks. When an air compressor hose leaks, the equipment uses up a lot more energy to pump out the same amount of compressed air. That can cost a lot of money.

Regular inspection of piping, joints, hoses, valves and fittings can save money as it often leads to early detection of leaks.



According to [eex.gov.au](http://eex.gov.au), some compressed air systems lose up to 50% of their air through leaks. This is a significant cost. These leaks can occur in a number of places:

- hoses and couplings
- pipes and pipe joints
- pressure regulators
- valves that are left open
- improperly sealed threads

A technical service provider or EcoSmart Electrician with an ultrasonic leak detector can easily locate leaks in a compressed air system. This is a quick and efficient way to detect and fix leakages.

You can also walk around and check your system after-hours when it's quiet. A large leak is obvious; you can often hear it. A low-tech 'do-it-yourself' way to check for leaks is to apply soapy water to the pipes and look for bubbles.

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***Some compressed air systems lose up to 50% of their air through leaks<sup>60</sup>***

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<sup>60</sup> [EnergyCut.info/ct-compressed-air](http://EnergyCut.info/ct-compressed-air)



## Operating pressure and equipment placement

When you have the air pressure set too high, you can use up more energy and increase your running costs. You also run the risk of increasing the number of leaks in your system.

Where possible, get your tasks done with the lowest possible pressure – the financial savings from this can be significant.

- Reducing the pressure of your system by 10% can lead to 5% savings in energy. When reducing the pressure like this, make sure you do it in small, staged amounts. This will ensure that you get the job done without damaging any equipment.
- Where possible, you should also place your equipment so that there is the smallest distance possible between the air compressor and the outlets where the compressed air is used.
- Shortening the distance will lower the pressure loss and energy use, which in turn lowers the bills.

## Air intake temperature

Where possible air compressors should be situated in cool environments – this reduces energy consumption as cool air is easier to compress. If this is not possible, ducting outside air into the air compressor intake can save you money.

Try to reduce your air intake temperature by as much as possible. When you reduce your air compressor intake temperature by 4°C, you reduce the amount of power needed to run the compressor by 1%.<sup>61</sup>

Using air storage units (air receivers) and heat recovery units can also assist in reducing costs.

According to Ausgrid, up to 90% of the energy used by a compressor can be lost as heat. Heat recovery units can recover 25-80% of the energy supplied to an air compressor.<sup>62</sup> This can be utilised for other purposes such as heating water, low-grade space heating or preheating boiler water. Ask an EcoSmart Electrician or compressed air expert if this technology can save money in your business.

<sup>61</sup> [EnergyCut.info/ct-compressed-air](http://EnergyCut.info/ct-compressed-air)

<sup>62</sup> Source: Page 21 of 'Compressed Air – opportunities for businesses' [EnergyCut.info/ct-compressed-air](http://EnergyCut.info/ct-compressed-air)

## Equipment replacement

You should get a unit that matches your requirements. Buying an air compressor that's bigger than you need is an easy way to waste money.

When replacing old equipment, consider whether the new equipment should use variable speed drives. These VSDs have the ability to adjust the speed of the motor on your equipment and they are particularly efficient when the demand for compressed air varies.

This flexibility enables them to use less energy, which will save you money. Fitting a system with a VSD can generate energy savings of up to 50%.<sup>63</sup>

## Further information on compressed air equipment

The Australian Industry Group has produced an excellent video that shows you how to reduce the running costs of compressed air equipment. You can check it out at this page:

[EnergyCut.info/aig-compressed-air-video](http://EnergyCut.info/aig-compressed-air-video)

'Compressed Air - Opportunities for businesses' is another excellent resource for companies who want to reduce their compressed air energy bills. It can be downloaded from [EnergyCut.info/ct-compressed-air](http://EnergyCut.info/ct-compressed-air)

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*Up to 90% of the energy used by a compressor can be lost as heat<sup>64</sup>*

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<sup>63</sup> Source: Ausgrid 'Becoming an energy efficient business'

<sup>64</sup> Source: Ausgrid 'Becoming an energy efficient business'



## Do you need ‘power factor correction’?

If the electricity that your business uses costs more than \$35,000 a year, you may benefit from the installation of a ‘power factor correction’ unit by an EcoSmart Electrician.

According to Ausgrid, businesses that improve their power factor from 70–95% can reduce their bills by up to 5%. Payback for improving your power factor can be as low as 1–3 years.

Your EcoSmart Electrician can explain the relevance of this to your business.

### St Andrews Village, NSW

Director of Care at St Andrews Village, Pip Carter, advises other aged care facilities to invest in equipment and to get buy-in from top levels for energy efficiency upgrades.

“To generate significant long-term savings you often need to invest in new equipment, which can be quite costly,” said Carter. “To get your initiatives across the line, pitch the benefits to the Board from a business point of view, in terms of cost savings and payback periods for any new equipment.”<sup>65</sup>

<sup>65</sup> [EnergyCut.info/oeh-st-andrews-village](http://EnergyCut.info/oeh-st-andrews-village)





## STEP 13

# Save money on transport

**It's an issue many of us talk about – the price of petrol, LPG and diesel seems to be getting more expensive every year.**

Filling up your car, ute or truck can be a big hit on the bottom line for many SMEs.

Once you take into account depreciation, insurance, servicing, repairs, tyres and registration, as well as fuel, it costs many thousands of dollars to run a vehicle every year. And that's even before you add parking fees and tolls!

There is good news, however. When it comes to transportation costs, there are lots of opportunities to save energy and money. This section will show you how.

**Tip:** When working out the fuel and running costs of your work vehicles - if you have not kept odometer readings, go over your servicing records to see if you can get an approximate odometer reading for the past year.



# Did you know?

## Step 13: Transport

Make sure your vehicle is regularly serviced. If an engine has been badly maintained, getting it serviced and properly tuned can improve a car's fuel efficiency by an average of 4%.

See page 320

If your company spends \$100,000 per year on fuel, switching to high-quality fuel-efficient tyres can save you up to \$6,000 per year.


See page 321

Speed matters!  
At 110km/h your car can use up to 25% more fuel than it would cruising at 90km/h.

See page 319

Correct tyre pressure can improve fuel efficiency by up to 4%, improve handling and extend the life of the tyre by up to 10%.

See page 322



See page 321

[Back to Contents](#)



## FUEL CONSUMPTION

MAKE MODEL VARIANT  
TRANSMISSION FUEL TYPE

Fuel Consumption (L/100km)

**12.4**

Combined Test

**16.7**

Urban

**9.8**

Extra Urban

CO<sub>2</sub> Emissions (g/km)

**291**

Combined Test

Carbon dioxide (CO<sub>2</sub>) is the main contributor to climate change

Vehicle tested in accordance with ADR 81/02. Actual fuel consumption and CO<sub>2</sub> emissions depend on factors such as traffic conditions, vehicle condition and how you drive. More information at [www.greenvehicleguide.gov.au](http://www.greenvehicleguide.gov.au)

See page 331

**It is estimated that 5–15% of light-duty fuel consumption is used to overcome rolling resistance for passenger cars. For heavy trucks, this quantity can be as high as 15–30%.**

See page 323

**Minimising the weight that you carry will improve fuel efficiency, so clear out any clutter from the boot or back seat of passenger vehicles. Every 50kg of extra weight increases fuel consumption by about 2%.**

See page 324

**If you're buying a work car, look out for the Fuel Consumption label. This is on the front windscreen and tells you how many litres the car uses to drive 100km. The more fuel-efficient it is, the more money you will save.**

See page 331

**The savings that can be generated by opting for a fuel-efficient vehicle are significant. A less fuel-efficient car can cost twice as much to run as a fuel-efficient alternative.**

See page 335

**Many SME owners find that their work vehicle is not needed for frequent daily use. This is a good reason to consider joining a car-share scheme.**

See page 326



# In this step

## No cost/low cost

- ▶ How fuel-efficient driving can save money
- ▶ Maintain your vehicles to maximise fuel savings
- ▶ How tyres can save on fuel costs
- ▶ Minimise loads and reduce wind resistance
- ▶ Organise trips to minimise fuel use
- ▶ How car sharing can save money
- ▶ How telecommuting saves on office costs
- ▶ Can you get on your bike?

## Invest & save

- ▶ Save money by buying or leasing a fuel-efficient vehicle
- ▶ Buying a fuel-efficient truck
- ▶ Save money on running costs with a fuel-efficient vehicle
- ▶ Save money on hire cars when travelling for work



## No cost/low cost

### How fuel-efficient driving can save money

Did you know that you can save a lot of money by adopting new driving habits and techniques? Here are some quick tips for fuel-efficient driving:

- Don't leave the motor running when the vehicle is stationary. Most vehicles do not need to be 'warmed up' except in very cold conditions and after long periods of non-use.
- Avoid speeding and hard acceleration. This can reduce fuel costs by up to 30–37% on motorways and by up to 5% around town.<sup>1</sup> Watching ahead and using cruise control on motorways will also keep speed constant, which can lead to lower fuel consumption.
- Driving your car too hard can also cause costly wear and tear on the engine, tyres, transmission and brakes.
- Where possible, avoid driving during peak hour when there is lots of traffic congestion. This will help you to minimise 'stop-start' driving – which can increase fuel consumption by up to 30%.<sup>2</sup>
- The faster you drive, the greater the wind resistance and fuel consumption. At 110km/h your car can use up to 25% more fuel than it would cruising at 90km/h. Open sunroofs and windows will also significantly increase fuel consumption at faster speeds – in some cases by as much as 20%.<sup>3</sup>
- Turn off the air-conditioning. Using the air-con in your car can add up to 10% to your fuel costs. However when you are driving at 80km/h or over, it is better to use the air-con at the lowest setting rather than opening windows – at that speed open windows create aerodynamic drag, increasing fuel consumption.<sup>4</sup>



1 [EnergyCut.info/efficient-driving](https://www.energycut.info/efficient-driving) and [EnergyCut.info/saving-gas](https://www.energycut.info/saving-gas)

2 [EnergyCut.info/racq-traffic-effects](https://www.energycut.info/racq-traffic-effects)

3 [EnergyCut.info/gvg-tips](https://www.energycut.info/gvg-tips) and [EnergyCut.info/fuel-efficiency-tips](https://www.energycut.info/fuel-efficiency-tips)

4 [EnergyCut.info/fuel-efficiency-tips](https://www.energycut.info/fuel-efficiency-tips)

- If the inside of your car is hotter than the outside, open the windows at the start of your trip for a few minutes, and let the heat out before starting the air-con. If it's less than 18°C outside and you want to refresh the air in your vehicle, don't open the windows or turn on the air-conditioning – use the vents instead.
- Minimise loads in utes and vans by only taking what you absolutely need to carry out your day's work.
- If you have a number of vehicles and a large fuel bill, send yourself and your employees on an eco-driving course that teaches fuel-saving driving techniques.

### Go Easy – the free online EcoDrive tool

Eco-driving initiatives in the heavy vehicle sector are already well-established as they can save a large amount of money. But what about passenger cars, four-wheel drives and light commercial vehicles?

A RACQ EcoDrive trial involving 1,300 Queenslanders, showed that more careful driving can reduce your fuel bill by 4.6%. Their EcoDrive online training program encompasses driver behaviours, vehicle maintenance and trip-planning actions that all help to reduce fuel consumption.

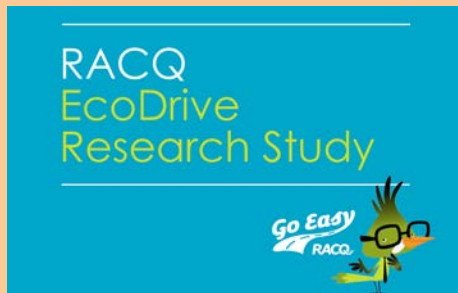
The 4.6% fuel saving statistic was equivalent to a 0.51 litres per 100 kilometres (l/100km) reduction in fuel use among participants; and 15% of the people in the trial achieved a 15.1% or 1.7l/100km reduction.

If you want to learn how to EcoDrive, the RACQ 'Go Easy' online learning tool can be accessed free of charge via:

[EnergyCut.info/go-easy](https://EnergyCut.info/go-easy)

For more information about the RACQ EcoDrive initiative, visit

[EnergyCut.info/racq-drive](https://EnergyCut.info/racq-drive)





***Speed matters! At 110km/h your car can use up to 25% more fuel than it would cruising at 90km/h.<sup>5</sup>***

### Recharging vehicles with solar power

Neil Howitt of Albany Solar in WA has found an innovative way to get around paying excessive petrol bills.

He purchased a Mitsubishi 4WD Outlander PHEV, a hybrid car which combines a plug-in electric motor and petrol engine. When



the vehicle is at his work place or home, he recharges the electric battery with the solar power that is not being used by his home or business.

The result is that all of Neil's commuting and business activities in Albany results in his 4WD being entirely solar powered. The only time he needs to use petrol is when he travels to Perth or goes on holiday.

For very long journeys, the hybrid Outlander PHEV uses less petrol than a conventional 4WD. However where it operates best is for shorter journeys. If the journey is less than 100 km, with a fully charged battery the petrol engine can use as little as 1.9L of fuel per 100km.<sup>6</sup>

<sup>5</sup> [EnergyCut.info/gvg-tips](http://EnergyCut.info/gvg-tips)

<sup>6</sup> Source: DoSomething and Albany Solar

## Maintain your vehicles to maximise fuel savings

Keeping your vehicles well maintained will optimise fuel efficiency, extend the life of engines and reduce the risk of ‘unscheduled’ or ‘catastrophic’ breakdowns on the road, which can ruin delivery schedules and be very costly!

Maintenance tips:

- Make sure your vehicle is regularly serviced. If an engine has been badly maintained, getting it serviced and properly tuned can improve a car’s fuel efficiency by an average of 4%.<sup>7</sup>
- Ask your mechanic to pay particular attention to the parts of the engine that relate to fuel efficiency.
- Have the wheel alignment checked (usually every six months or 10,000km, whichever comes first).
- Top up coolant regularly and use the correct grade of motor oil. Your fuel mileage can be improved by by 1-2% by using the manufacturer’s recommended grade of motor oil.<sup>8</sup>
- Replace tyres regularly and maintain correct tyre pressure – see the next tip ‘How tyres can save on fuel costs’ for more detail on the fuel-saving potential of tyre choices.



<sup>7</sup> [EnergyCut.info/vehicle-in-shape](https://www.energycut.info/vehicle-in-shape)

<sup>8</sup> [EnergyCut.info/vehicle-in-shape](https://www.energycut.info/vehicle-in-shape)



## How tyres can save on fuel costs

When it comes to tyres, issues of safety and performance are a priority for most people. However, not many people think about the efficiency of the tyres and their contribution to fuel usage.

Tyre manufacturer Michelin estimates that tyres can account for up to 20% of your fuel consumption. That's equivalent to one tank of fuel out of every five.<sup>9</sup> So buying fuel-efficient tyres can save you money.



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*If your company spends \$100,000 per year on fuel, switching to high-quality fuel-efficient tyres can save you up to \$6,000 per year.<sup>10</sup>*

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### **What is rolling resistance?**

**Rolling resistance, sometimes called rolling friction or rolling drag, is the force that resists motion when a tyre rolls on the road.<sup>11</sup>**

**Look for tyres with 'low-rolling resistance'. These tyres can reduce your fuel bills by up to 6%.<sup>12</sup>**

Also, make sure you pump up your fleet's tyres to the manufacturer's recommended levels each week. It may sound tedious, but it makes your vehicles safer and more fuel-efficient, saving you money.

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<sup>9</sup> [EnergyCut.info/michelin-tyres](https://www.energycut.info/michelin-tyres)

<sup>10</sup> [EnergyCut.info/bridgestone-ecopia](https://www.energycut.info/bridgestone-ecopia)

<sup>11</sup> [EnergyCut.info/rolling-resist](https://www.energycut.info/rolling-resist)

<sup>12</sup> [EnergyCut.info/ecopia-stat](https://www.energycut.info/ecopia-stat)

Correct tyre pressure can improve fuel efficiency by up to 4%, improve handling and extend the life of the tyre by up to 10%.<sup>13</sup>

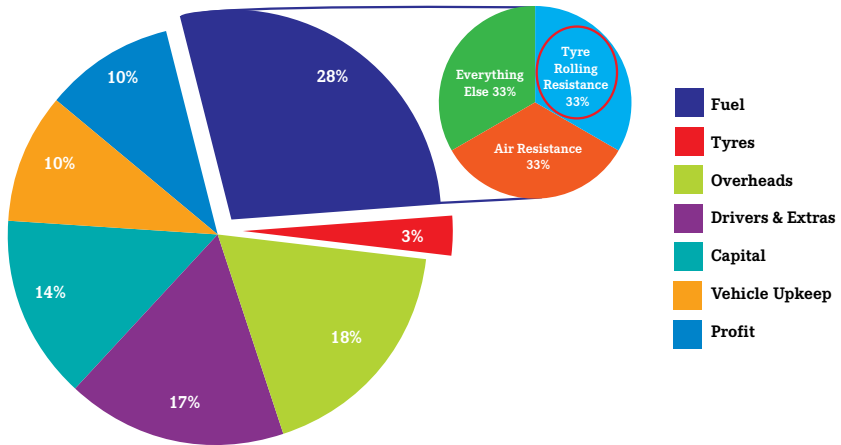
**Did you know?** 400 million Michelin low-rolling resistance tyres – also called fuel-efficient tyres – have been sold in Europe since 1992. These tyres have enabled an estimated saving of 9.5 billion litres of fuel.<sup>14</sup>

## Tyres in your fleet

According to Bridgestone Tyres, fuel is the major running cost for fleets in Australia, accounting for almost a third of their total outgoings. The effect of tyre rolling resistance is calculated at approximately 10% of a fleet's total running costs. This is a significant expense.<sup>15</sup>

How much could your business save by examining your tyre choices?

### Average Fleet Expenditure \*



\*Figures based on survey of major fleet customers conducted by Bridgestone Australia

\*\*Rolling resistance quotients calculated using Secrets off Better Fuel Economy, published by Cummins in 2006

<sup>13</sup> [EnergyCut.info/tyre-inflation](http://EnergyCut.info/tyre-inflation)

<sup>14</sup> [EnergyCut.info/michelin-tyres](http://EnergyCut.info/michelin-tyres)

<sup>15</sup> [EnergyCut.info/ecopia-stat](http://EnergyCut.info/ecopia-stat)





### How much can truck fleets save on fuel with energy efficient tyres?

Bridgestone has been trialling using Ecopia and trailer tyres across multiple B-Double, tanker and trailer applications in Australia to see what kinds of fuel efficiencies can be achieved.

“On average, we have been seeing up to a 6% fuel saving across the fleets we have been working with,” said Claudio Sodano, Bridgestone’s National Technical Field Service Manager.

### Ron Finemore Transport, locations around Australia

Ron Finemore Transport carries out long distance line-haul transport services. Given the long distances travelled by their trucks, they decided to fit fuel efficient, low-rolling resistance tyres on their fleet of prime movers and trailer combinations.

They estimated that the annual benefits for a typical RFT vehicle was a fuel consumption saving of 7,137 litres of fuel. They also reported that in trials, an average fuel consumption saving of 5% was realised.

They reported that “the cost savings from lower fuel consumption achieved by fitting Low Profile Tyres to RFT vehicles far outweigh the extra tyre purchase and operating costs,” and that “Low Profile Tyres provide an attractive, timely pay back on the extra investment required.”

Other savings came about when it came to recapping the tyres. They reported that “Michelin 275/80R22.5 tyres can be re-capped 3 times, while standard tyres can be re-capped twice.”<sup>16</sup>

*‘It is estimated that 5–15% of light-duty fuel consumption is used to overcome rolling resistance for passenger cars. For heavy trucks, this quantity can be as high as 15–30%.’<sup>17</sup>*

– Alternative Fuels Data Centre

<sup>16</sup> EnergyCut.info/rf-tyres

<sup>17</sup> EnergyCut.info/tyre-savings

## Minimise loads and reduce wind resistance

**Minimise loads** – What’s in the boot of your car? Golf clubs that only come out once a week? What is in your ute? Rarely-used tools or materials that you don’t need for your current job?

Minimising the weight that you carry will improve fuel efficiency, so clear out any clutter from the boot or back seat of passenger vehicles. Every 50kg of extra weight increases fuel consumption by about 2%.<sup>18</sup>

**Reduce wind resistance** – The faster you drive, the greater the wind resistance and fuel consumption. Remove roof racks, spoilers and other external attachments when they are not needed. Driving behaviours such as having open sunroofs and windows can increase fuel consumption by as much as 20% depending on how fast you are going.<sup>19</sup> So minimise wind resistance by keeping windows and sunroofs closed on motorways.



### Ferguson Plarre Bakehouses, VIC

Ferguson Plarre Bakehouses fitted wind deflectors to all trucks to reduce drag and save on fuel. According to CEO Steve Plarre, this simple step has been one of their most successful energy efficiency measures. They also train their drivers on how to drive economically with less vigorous braking. These measures are reducing fuel consumption by around 10%.<sup>20</sup>

<sup>18</sup> [EnergyCut.info/weight-fuel](https://www.energycut.info/weight-fuel)

<sup>19</sup> [EnergyCut.info/fuel-efficiency-tips](https://www.energycut.info/fuel-efficiency-tips)

<sup>20</sup> [EnergyCut.info/dosomething-research](https://www.energycut.info/dosomething-research) and [EnergyCut.info/ferguson-sustainability](https://www.energycut.info/ferguson-sustainability)



## Organise trips to minimise fuel use

Avoid short trips wherever possible and plan ahead to combine multiple meetings or deliveries.

Companies such as Linfox and Finemore structure their deliveries to maximise efficiencies and reduce fuel waste.

Why not do the same?

If you're visiting clients or delivering goods, try to organise your travel into geographic zones. This will minimise the kilometres travelled, saving you valuable fuel and time.



### Two Men and a Truck, NSW

Sydney removalists Two Men & A Truck implemented a vehicle-movement plan to reduce energy consumption. With customer permission, they seek opportunities to rationalise and combine loads that are then delivered to multiple locations.

In addition they use a container vehicle with trailer, which doubles the volume of goods on interstate runs. Combined with set times for morning and afternoon runs, this enables them to do as many deliveries over a three-day period as was previously done over a five day period. This makes the removals more efficient and it saves on fuel costs.<sup>21</sup>



<sup>21</sup> [EnergyCut.info/transport-case-study](http://EnergyCut.info/transport-case-study)

## How car sharing can save money

Imagine if you didn't have to carry the cost of buying or leasing a vehicle for your business? This is now possible thanks to car-sharing schemes.

Membership of a car-sharing service is a good way for city-based SMEs to save a large amount of money. Cheaper than taxis or rental cars, car-sharing services can free your business from the expense, not only of vehicle ownership or leasing, but from maintenance, registration and insurance too.

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*Many SME owners find that their work vehicle is not needed for frequent daily use. This is a good reason to consider joining a car-sharing scheme.*

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Car-sharing schemes can be used by a wide variety of businesses. For example, visiting clients or making deliveries (some car-sharing schemes have utility vehicles for this purpose).

Vehicles are accessible 24-hours-a-day from a wide range of metro locations. You can book a car online and it will be waiting in a designated place. You park the car in the same spot when you're finished.

Members pay for use according to the distance travelled and the length of time used – you can rent the car for as little as one hour or as long as you like. The cost of petrol is included in the rate.

Though currently most common in Sydney and Melbourne, car-sharing schemes are also taking off in Adelaide and Brisbane and other communities.

For more information go to:

[GoGet.com.au](http://GoGet.com.au)

[Flexicar.com.au](http://Flexicar.com.au)

[GreenShareCar.com.au](http://GreenShareCar.com.au)



## GoGet, locations around Australia

GoGet is Australia's largest car-sharing service and operates in Melbourne, Sydney, Adelaide, and Brisbane. Currently, GoGet has 50,000 members and 1,700 vehicles, and has serviced over two million bookings.



*Sven Ollmann of MBMO Architects*

Car-sharing services like GoGet allow people to forgo car ownership which is especially useful in crowded urban environments. GoGet members don't need to pay for fuel as it is included in the hourly rate making budgeting easier. The consumer group Choice described them as, 'an outstanding example of a car-share company providing a cost-effective and secure alternative to car ownership or rental.'

As with other car-sharing companies, it now services small businesses who want to reduce their transportation costs.

One of their customers is an architectural company, MBMO, whose staff go to meetings and regularly visit project sites. Before signing up to GoGet, they had to bear the cost of expensive taxi fares. But since signing up, their Managing Director Sven Ollman says, "We've saved money and now we don't have to sit in traffic in a cab while the meter's running."

Small business guru David Koch checked out the benefits of car sharing for small business. You can watch his video here:

[EnergyCut.info/go-get-koch](https://www.energycut.info/go-get-koch)<sup>22</sup>



<sup>22</sup> [EnergyCut.info/dosomething-research](https://www.energycut.info/dosomething-research)  
[EnergyCut.info/choice-car](https://www.energycut.info/choice-car)  
[EnergyCut.info/go-get](https://www.energycut.info/go-get)

## How telecommuting saves on office costs

Have you thought about incorporating telecommuting into your staffing arrangements?

Having staff members who don't always have to be in the office saves you on the number of desks, phones and computers you need to buy and office space that you need to rent, thereby reducing your costs.



The additional benefit of telecommuting is that it can reduce travel stress on your employees who don't live closeby. This can lead to better productivity.

With the internet getting faster all the time, you can now keep in constant contact with out-of-office staff via Skype and other video platforms. Cloud-based computing means documents can be shared and worked on at the same time.

Re-evaluate staff travel too. Could any trips be replaced by video conferences? This would save not only on fuel costs or airfares, but also on vehicle maintenance, insurance and lost productivity due to under-utilised time spent in transit.

Want to find out more? Go to [EnergyCut.info/telecommuting-tips](https://www.energycut.info/telecommuting-tips) for more information.

## Can you get on your bike?

If you live close to where you work, why not cycle or walk there? It will keep you fit and best of all, you won't have to pay for petrol. If you lease your work car, you may be able to combine the bike with occasional use of a car-sharing service and do away with the car altogether.





If there are a lot of hills on your route, why not get yourself an electric bike? This is far cheaper to run than a car.

There are many options now available in Australia. For advice, go online or visit a specialist bike shop that has a good range of electric bikes.

### Nick Logan Pharmacy, NSW

Nick Logan Pharmacy have chosen not to use people with cars to do their deliveries. Instead, they save money and cut down on pollution by hiring local young people to do the deliveries on bikes. They further save costs by emailing, instead of posting their invoices and statements.<sup>23</sup>

### Domino's, locations around Australia

A number of Domino's stores are converting from delivery scooters to electric pushbikes in an effort to speed up delivery times.

Tracy Stephenson from Domino's says, "These pushbikes are proving extremely efficient and are incredibly safe and economical for our franchisees to run.

At Domino's we are committed to moving to electric scooters and pushbikes nation-wide."<sup>24</sup>



<sup>23</sup> [EnergyCut.info/nick-logan](http://EnergyCut.info/nick-logan)

<sup>24</sup> [EnergyCut.info/dosomething-research](http://EnergyCut.info/dosomething-research)  
Image courtesy of Dominos



# Invest and save

## Save money by buying or leasing a fuel-efficient vehicle

Australians buy more than one million cars every year.<sup>25</sup>



If you're looking to save money, a fuel-efficient vehicle is the best choice. Here are some tips to keep in mind when buying or leasing vehicles for your business:

- If your business owns or leases vehicles, you should do an annual review to ensure that you don't have too many.
- Assess whether your business is using the right type of vehicles. Buying or leasing bigger and more expensive vehicles can seem attractive from a prestige point of view, but the rising cost of fuel makes fuel-efficient models a better choice for the bottom line of your business.
- Think about the most appropriate vehicle for your needs. If you operate your business in an inner-city area, there are many advantages to having a smaller car, with four cylinders rather than six for instance – they're cheaper to buy, easier to park and use less fuel.
- If you're wandering around a car yard, look out for the Fuel Consumption label on cars you're interested in buying or leasing. This is on the front windscreen and tells you how many litres the car uses to drive 100km. The more fuel-efficient it is, the more money you will save. See later in this chapter for more information on how to read a fuel consumption label.
- When you're buying or leasing a car, the [GreenVehicleGuide.gov.au](https://www.greenvehicleguide.gov.au) website can help your business to save thousands of dollars in future fuel costs. By helping you choose a more fuel-efficient vehicle, it also helps to reduce air pollution.
- The website also has a handy fuel calculator that can determine your annual fuel costs. By entering the number of kilometres you drive each year, you can compare the fuel costs of one vehicle against another before you lease or buy it.

<sup>25</sup> EnergyCut.info/fcai-report





- Additional comparisons include:
  - fuel consumption on litres per 100 kilometres
  - an air pollution rating
  - fuel type.

For further information, visit [GreenVehicleGuide.gov.au](http://GreenVehicleGuide.gov.au)

## Look for the fuel consumption label

When you're buying or leasing a new or second-hand car, make sure you look out for the fuel consumption label. All new passenger cars, four-wheel drives and light commercial vehicles<sup>26</sup> have to display them.

They will tell you how many litres of fuel the vehicle uses to take you 100km. If it uses five litres to get you 100km, this is expressed on the label as 5L/100km.

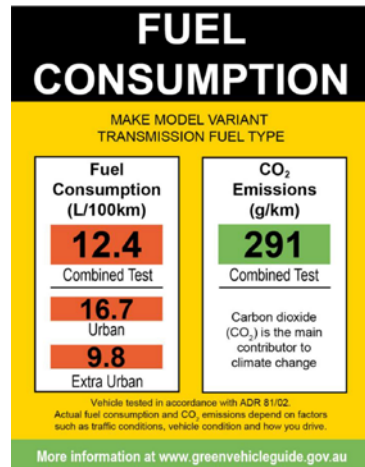
The lower the figure, the more money you'll save on fuel running costs.

There are three fuel consumption figures on the label – 'combined', 'urban' and 'extra-urban'. These tell you how much fuel the vehicle uses in different driving scenarios.

- The figure on the 'urban' label will be 20-50% higher than the combined figure. This is because urban driving uses more fuel. If your driving is primarily in urban environments, this figure should guide your purchasing decision – it will save you money on fuel costs.
- If you drive on motorways or freeways a lot, then take note of the 'extra-urban' number.

For more information visit:

[EnergyCut.info/consumption-label-fuel](http://EnergyCut.info/consumption-label-fuel)



<sup>26</sup> Up to 3.5 tonnes gross vehicle mass

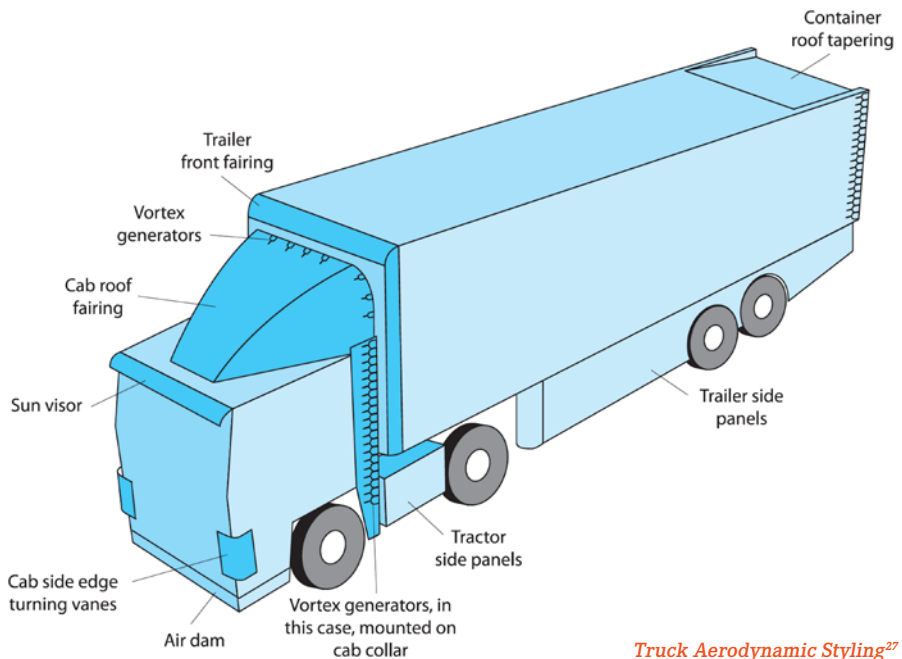
## Buying a fuel-efficient truck<sup>27</sup>

If you're a small business that uses a truck in the course of your work, then you need to visit [TruckBuyersGuide.gov.au](http://TruckBuyersGuide.gov.au). The guide has:

- a step-by-step guide that helps you in the selection of a fuel-efficient truck
- an interactive overview that shows you what to look out for when buying a fuel-efficient truck.

The site also details the fuel usage impacts of:

**Aerodynamic aids** - If you drive a truck at speeds of 80 km/h or above, air deflectors can save you fuel. They can also improve the handling of your truck. Cab roof deflectors, side fairings and body panels are other aftermarket products that can be fitted by specialists to your truck. The front of a truck and the gap between the cab and the body can have a big impact on fuel consumption, so visit the site to check your options.



*Truck Aerodynamic Styling<sup>27</sup>*

<sup>27</sup> This information has been adapted from [TruckBuyersGuide.gov.au](http://TruckBuyersGuide.gov.au)

<sup>28</sup> Image source: Department for Transport UK, Freight Best Practice: Quick Guide to Truck Aerodynamics



**Sat Nav and route planning systems** - These can get you to a delivery location via the most efficient route, thereby reducing fuel wastage and costs.

**Ancillary equipment** - When you add refrigeration units to trucks or mount cranes and tail lifts on them, it extracts power from your engine and increases fuel costs. If you add equipment that is not matched to the size of your engine, it can run the motor harder, leading to extra fuel consumption. The site recommends that you get advice from dealers and aftermarket suppliers to ensure that ancillary equipment is matched to the size of your engine.

**Fuel-efficient driving techniques** - The site shows how smoother, careful driving can reduce fuel consumption by 5-10% (and in some cases by as much as 30%). Check the site for links to accredited vehicle training providers.

**Idling reduction** - Trucks and lights have one thing in common. When you switch them off you save money. Reducing unnecessary vehicle idling is a guaranteed way to reduce fuel costs. The site has suggestions on the best way to minimise this problem.

**Buying a new truck or commercial vehicle** - The site has a checklist to help you choose the right vehicle for your type of business.

**Dealer support** - If you're buying from a dealer, check to see if they have a good repair workshop. A good workshop can minimise the amount of time that your vehicle is off the road and in for repairs.

## Two Men and a Truck, NSW

Two Men and a Truck introduced a vehicle acquisition policy that aimed to reduce energy consumption. Their 'fleet transition plan' to energy efficient vehicles began with the investment in two replacement trucks to their fleet – an Isuzu SiTEC Series III and a Mercedes Atego. This saved \$1,730 per year in fuel costs, and a further \$4,195 per year on servicing and maintenance costs – a total saving of \$5,925 per year. For a company of their size, this is a significant saving.<sup>29</sup>

<sup>29</sup> [EnergyCut.info/transport-case-study](http://EnergyCut.info/transport-case-study)

## Want to save fuel with your trucks? Ask yourself these questions!

- 1) Do you monitor and measure your fuel use?
- 2) Have you identified appropriate training courses for yourself or your drivers?
- 3) Is engine idling a habit with your drivers?
- 4) Have you developed an appropriate vehicle specification for either your own vehicle or your fleet?
- 5) Are your vehicles fitted with suitable aerodynamic equipment
- 6) Is the aerodynamic equipment - and the vehicle as a whole - in good enough condition to achieve optimum aerodynamic performance?
- 7) Do you specify low-rolling resistance tyres?
- 8) Are tyres regularly checked for pressure and condition?
- 9) Are your wheels regularly checked for alignment?
- 10) Do you maximise all opportunities for back-loading?
- 11) Do you have a preventative maintenance program in place?
- 12) Do you use or have you investigated the use of journey planning software?



Answer these questions and you could save significant amounts of money on fuel.

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<sup>30</sup> Image source: [EnergyCut.info/compliance-signs](https://www.energycut.info/compliance-signs)



## Save money on running costs with a fuel-efficient vehicle

The savings that can be generated by opting for a fuel-efficient vehicle are significant. A less fuel-efficient car can cost twice as much to run as a fuel-efficient alternative. Let's compare them.

A fuel-inefficient car:

- can use 10 litres per 100 kilometres
- can cost an average of \$1,914 for fuel per year (this assumes 13,200km per year at \$1.45/L).

A more fuel-efficient car:

- can use 5 litres per 100 kilometres
- can cost an average of \$957 for fuel per year (this assumes 13,200km per year at \$1.45/L).
- Annual fuel saving = \$957 (a halving of fuel costs)<sup>31</sup>

For people who drive more than 13,200km a year, this comparison tells us there are potentially thousands of dollars to be saved. If your business has a number of different vehicles, then the savings can really add up.

In some cases, the fuel-efficient vehicles can be cheaper to buy, so you might also save on purchase/leasing costs as well as fuel.

If you're looking to buy a second-hand vehicle, the site also lists the fuel efficiency details of older model cars.

Check out the federal government's tips for buying a new car here:

[EnergyCut.info/buying-new-car](https://www.energycut.info/buying-new-car)

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<sup>31</sup> These savings are estimated using a sample petrol price of \$1.45 a litre over a travel distance of 13,200 kilometres per year with a mix of urban and rural driving. If you drive more than 13,200 kilometres per year, then the saving will increase.

## Whitford Real Estate, NSW

At Whitford Real Estate, one of the key energy efficiency measures has been replacing the company's branded vehicle with a more economical model – the Fiat 500 – which uses around 3.9L per 100km.

“It was previously costing \$95–\$100 a week on petrol but it is now only about \$44 – a saving of more than half!” said Director Michael Ferris. “We drive it around a lot but only have to fill it every few weeks. People around town think there are hundreds of them but there's only one!”

The car also features a special app for economical driving – you put a USB stick into the car, it analyses your driving style and recommends how to modify your driving style to save money on fuel.<sup>32</sup>

## Save money on hire cars when travelling for work

If you're travelling, why not hire a fuel-efficient vehicle? They use less fuel, so you'll pay less when you fill up before returning it. When customers forget to fill up hire cars, they are often charged \$3–\$4 per litre by the hire company to refill, so you'll save money there too.

Fuel-efficient vehicle types often have a lower daily rate which means more savings on the hire charge too.



**Renting a car is a great way to 'try before you buy'. If you find a car that has rated well on the Green Vehicle Guide, why not rent it for the day to check that it's the right vehicle for your business?**

<sup>32</sup> [EnergyCut.info/whitford-property](http://EnergyCut.info/whitford-property)



## The Fuel Consumption Guide Database

The [GreenVehicleGuide.gov.au](http://GreenVehicleGuide.gov.au) database has fuel efficiency details for all cars sold since 2004.

However, if you want to buy a car that was made between 1986 and 2003, you can still check its fuel consumption by visiting [EnergyCut.info/fuel-consumption-check](http://EnergyCut.info/fuel-consumption-check)

The database allows you to check passenger cars, four-wheel drives, and light commercial vehicles up to 2.7 tonnes gross vehicle mass.



## Transport Guide

The UK Department of Transport released a guide in 2009 called 'Efficient Operations for Small Fleets and Owner-drivers'. The guide shows the many ways to reduce fuel costs in smaller transportation businesses. It can be downloaded from: [EnergyCut.info/fleet-guide](http://EnergyCut.info/fleet-guide)









# Cut your refrigeration costs

## STEP 14

**Every business uses refrigeration of some kind – even if it's only in the office for your milk.**

Some businesses use more than others. For many retailers, cafes, restaurants, clubs and food-related businesses, the cost of refrigeration is a major part of their energy bill.

In fact, in 2012, Australians spent nearly \$5 billion on refrigeration-related energy bills.<sup>1</sup> However, there are ways to reduce these costs:

- Some simple no-cost and low-cost practices can easily reduce refrigeration expenses by 15–20%.<sup>2</sup>
- If you're replacing fridges that are more than 15 years old, you can potentially reduce refrigeration expenses by up to 40%.<sup>3</sup>

Because refrigeration equipment runs 24 hours a day, it really pays to have the most energy efficient equipment possible.

This section gives you the no-cost/low-cost ways to save money when keeping things cold. It also shows you how to set about buying the most energy efficient refrigeration equipment.

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***If your fridge or freezer is 15 years old, replace it. Today's models use 40% less energy.***

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<sup>1</sup> Cold Hard Facts 2, p.85, prepared by 'The Expert Group' on behalf of the DCCEE.

<sup>2</sup> [EnergyCut.info/refrigeration-save](http://EnergyCut.info/refrigeration-save)

<sup>3</sup> [EnergyCut.info/appliances-save](http://EnergyCut.info/appliances-save)



# Did you know?

## Step 14: Refrigeration

Reducing a refrigerator's temperature by 1°C can increase its energy consumption by 2–4%.

See page 344

Turning off an unused 400L fridge can save up to \$220 a year.

See page 346

Tests show that enclosed refrigeration units with glass doors reduce energy use by 30-68%.

See page 347

Keep your freezers frost-free! Any ice build-up greater than about 5mm in thickness will act as an insulator, leading to increased energy consumption and cost.

See page 345



See page 345

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Lights in commercial fridges don't just use energy – they also generate heat. This heat has to be chilled so it increases the costs of your refrigeration.

See page 352



See page 346

A fridge works best when it's at least two-thirds full and a freezer when it's at least three-quarters full. The more empty space you have, then the more energy you'll use in cooling the air inside.

See page 351

Research shows that businesses can obtain a 10% energy efficiency increase simply by replacing poorly-performing seals on refrigeration equipment.

See page 348

Over a 10-year period, buying a 4-star fridge instead of a 2-star version can save you up to \$480 in electricity costs.

See page 357

Every extra star on your fridge and freezer will save you up to 23% on its energy costs.

See page 357



# In this step

## No cost/low cost

- ▶ Ensure your refrigeration is not too cold
- ▶ Do you have a fridge you can turn off?
- ▶ Does your fridge need retrofitting?
- ▶ Maintain your fridge and save
- ▶ Place fridges away from heat
- ▶ Give it some space!
- ▶ Don't overfill or underfill
- ▶ Changing the lighting in commercial fridges
- ▶ Insulate your refrigeration equipment

## Natural refrigerants

- ▶ What are natural refrigerants?
- ▶ How can natural refrigerants help to reduce your energy bills?

## **Invest & save**

- ▶ **Buying domestic refrigeration equipment for your workplace**
- ▶ **Buying commercial refrigeration equipment**
- ▶ **Retrofitting commercial refrigeration equipment**
- ▶ **What to do if the unit you're buying is not on the energy-rating website**
- ▶ **What to do if your supplier doesn't know how many watts the machine uses**
- ▶ **Save money with coolrooms and cold storage**
- ▶ **Further information about commercial refrigeration**

## No cost/low cost

### Ensure your refrigeration is not too cold

From a food safety point of view, if you have meat or dairy in a fridge, the temperature should be at or below 5°C.<sup>4</sup>

With a freezer, the temperature should be set between minus 15°C and minus 18°C.<sup>5</sup>

For every degree that you set your fridge or freezer colder than these levels, you will increase your running costs by 2-4%.<sup>6</sup>

Using a thermometer will show if your equipment is at the right temperature. It will also show if your fridge and freezer thermostats are setting the temperatures properly.

If you're not sure if you have the right temperature levels, get a refrigeration specialist or EcoSmart Electrician to look over your equipment when they're doing their next maintenance check.

- You can find a refrigeration specialist via the Australian Refrigeration Council (ARC): [EnergyCut.info/arc-search](https://www.energycut.info/arc-search)
- You can find an EcoSmart Electrician via [EnergyCut.info/eco-smart](https://www.energycut.info/eco-smart)



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***“Reducing a refrigerator’s temperature by 1°C can increase its energy consumption by 2-4%”***

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<sup>4</sup> [EnergyCut.info/food-temp](https://www.energycut.info/food-temp)

<sup>5</sup> [EnergyCut.info/vic-govt-food](https://www.energycut.info/vic-govt-food)

<sup>6</sup> [EnergyCut.info/hospitality-service](https://www.energycut.info/hospitality-service)

<sup>7</sup> [EnergyCut.info/hospitality-service](https://www.energycut.info/hospitality-service)



### Watch out for frost

Keep your freezers frost-free! Any ice build-up greater than about 5mm in thickness will act as an insulator, leading to increased energy consumption and cost.<sup>8</sup>

Where necessary, defrost regularly as excessive ice build-up will reduce the operating efficiency of your refrigeration units.



### Craft Victoria, VIC

As part of a raft of energy efficiency measures, Craft Victoria saved money by reducing refrigeration energy costs. They previously ran two fridges 365 days a year but now they only use the larger fridge eight days a year as required for functions.<sup>9</sup>

<sup>8</sup> [EnergyCut.info/appliances-save](http://EnergyCut.info/appliances-save)

<sup>9</sup> [EnergyCut.info/craft-vic](http://EnergyCut.info/craft-vic)

## Do you have a fridge you can turn off?

Many companies have more than one refrigerator in their business. If you have two:

- Check if the contents of both could fit into a single fridge. If it can, switch one of them off. That saves money 24 hours a day.
- According to Origin Energy, turning off an unused 400L fridge can save up to \$220 a year (so only turn on a ‘beer’ fridge when you have to).<sup>10</sup>
- Switching off a fridge also means it is one less item that you need to buy and replace at the end of its working life.

### Bottle King, VIC

Bottle King of Pascoe Vale, Victoria, installed simple off-the-shelf plug-in timers to seven of their fridges. The timers were set to turn off at 11.15pm, and back on at 8.30am.

Each timer cost less than \$20 per fridge. With this simple measure they are saving \$950 on energy per year – and their payback period was less than 2 months.<sup>11</sup>



## Does your fridge need retrofitting?

If you have an old fridge and can't afford to upgrade to a new one, you may want to consider retrofitting it. A study carried out by The Moreland Energy Foundation<sup>13</sup> showed that:

- simple improvements to old fridges could deliver a 15% boost in energy efficiency



*Fitting new door seals can improve energy efficiency by 10%.<sup>12</sup>*

<sup>10</sup> Based on figures at [EnergyCut.info/second-fridge](http://EnergyCut.info/second-fridge)

<sup>11</sup> [EnergyCut.info/bottle-king](http://EnergyCut.info/bottle-king) (“based on an average of \$135 per year for a single glass door fridge” - MGA).

<sup>12</sup> Image via [www.bondfridges seals.com.au](http://www.bondfridges seals.com.au). Stat source: [EnergyCut.info/fridge-seals](http://EnergyCut.info/fridge-seals)

<sup>13</sup> [EnergyCut.info/fridge-seals](http://EnergyCut.info/fridge-seals) and [EnergyCut.info/moreland-energy](http://EnergyCut.info/moreland-energy)





- fitting new door seals improved energy efficiency by 10%
- installing more insulation delivered a 15–25% efficiency improvement
- replacing faulty compressors with a modern unit delivered a 50% improvement in energy efficiency.

### Putting doors on open display cases

Up to 75% of the energy used to run open case refrigerators is wasted.<sup>14</sup> That's a lot of money being spent unnecessarily.

Putting glass doors on display cabinets that don't have them can also save money. Tests show that enclosed refrigeration units with glass doors reduce energy use by 30-68%.<sup>15</sup>



*Open fridges like this can be retrofitted with doors that reduce energy use.<sup>16</sup>*

### Airds Country Meats, NSW

Airds Country Meats saved more than \$1,600 a year after owner Paul Edenborough recognised the need to replace out-of-date and inefficient equipment.

“We installed three refrigeration units which have made a huge difference to the store's upkeep,” he said. “Previously we would need to do at least three repairs a year. Now we do one maintenance check per year in September before the summer season. All works really well.”<sup>17</sup>

<sup>14</sup> [EnergyCut.info/open-refrigeration](http://EnergyCut.info/open-refrigeration)

<sup>15</sup> [Master Grocers Australia \(MGA\)](http://MasterGrocersAustralia.com.au) and [EnergyCut.info/comm-refrigeration](http://EnergyCut.info/comm-refrigeration)

<sup>16</sup> Image courtesy of Des Jackson

<sup>17</sup> [EnergyCut.info/airds-country-meats](http://EnergyCut.info/airds-country-meats)

## Maintain your fridge and save

To maximise the efficiency of your refrigeration equipment, you need to keep it properly maintained and cleaned. This will ensure that it's running to its optimum potential.

### Is it airtight?

Your fridge and freezer units need to be airtight, so check that the seals, hinges, catches and door gaskets are working properly. If not, replace them as needed.



You can check the door seals by placing a clean sheet of paper between them. If the paper falls out, this indicates that the fridge is leaking cold air and you'll need to replace them. This should only cost about \$60, so this action will pay returns.<sup>18</sup>

Keeping your fridge level on the floor also helps to ensure that the doors are tightly sealed and can help prevent the cool air from getting out.

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***Research shows that businesses can obtain a 10% energy efficiency increase simply by replacing poorly-performing seals on refrigeration equipment.<sup>19</sup>***

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### Defrosting

As has already been mentioned, defrosting your refrigeration equipment will help to maximise its efficiency and reduce running costs.

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<sup>18</sup> [EnergyCut.info/fridge-info](https://www.energycut.info/fridge-info)

<sup>19</sup> [EnergyCut.info/fridge-seals](https://www.energycut.info/fridge-seals)



## Oil levels, leaks and general running checks

When it comes to installing, repairing or maintaining your refrigeration equipment, you should always use a qualified technician.

Get them to:

- check for leaks
- check the compressor oil levels to ensure there is adequate and efficient lubrication
- check that the motors are okay. In the lead up to their visit, listen out to see if a fridge motor is running continuously or making a strange noise. If it is, let them know.

To find an authorised technician in your area, check out this searchable database from the Australian Refrigeration Council (ARC) at: [EnergyCut.info/arc-search](https://www.energycut.info/arc-search)

When you book a technician to install or fix your fridge or freezer, you can also check that they hold a valid licence by visiting this website: [EnergyCut.info/arc-tick](https://www.energycut.info/arc-tick)

If you need to save on costs, you could hire an EcoSmart Electrician and have them look at your refrigeration equipment when they're looking at other energy-related issues within your business.

### How keeping your fridge clean can save money

**Periodically clean the condenser coils on the back of your refrigerators, as a build-up of dust will inhibit their operation and add to energy costs (not all units have these coils placed externally, so don't be worried if you can't see them).**

## Le Breton Patisserie, NSW

Le Breton Patisserie achieved savings of 20% per annum with energy efficiency measures that included the overhaul of refrigeration systems. Following an audit, they replaced five old refrigerators with one energy efficient unit.<sup>20</sup>

<sup>20</sup> [EnergyCut.info/breton-pat](https://www.energycut.info/breton-pat)

## Place fridges away from heat

When you put a fridge directly adjacent to ovens, heaters or other heat-producing equipment, it will use more energy to maintain adequate temperatures.

The same applies if the fridge is in direct sunlight.

That may sound obvious but you'd be surprised by how many businesses do this and unnecessarily waste money.

**Encourage staff and customers to be as quick as possible when opening fridge or coolroom doors. Leaving them open too long will allow warm air inside – your equipment will then have to use energy to get that air cool again.**

### Ferguson Plarre, VIC

According to Ferguson Plarre CEO Steve Plarre, refrigeration is the single biggest energy efficiency challenge facing the retail side of bakery businesses.

Ferguson Plarre has saved on refrigeration costs by separating refrigeration areas from the oven area of the bakery. This has eliminated heat bleed into the areas of the bakery that need to be kept cold.

They have also fitted variable speed motors to fridge and freezer fans to iron out power spikes and reduce energy consumption.<sup>21</sup>

## Give it some space!

You should leave sufficient clearance space (generally at least 50–80mm) between the wall and the back of your fridge. Always check the manufacturer's recommendations to see if more space is needed for your model.

This helps with the energy efficiency as it allows good airflow around the condenser coils. It also allows hot air generated from the back of the fridge to dissipate. If your fridge sits in a nook you could also install vents to aid in creating good airflow around it.

Insufficient ventilation of these coils will reduce heat dispersal and can reduce energy efficiency by up to 15%.<sup>22</sup>

<sup>21</sup> [EnergyCut.info/dosomething-research](https://www.energycut.info/dosomething-research)

<sup>22</sup> [EnergyCut.info/origin-refrigeration](https://www.energycut.info/origin-refrigeration)



## Don't overfill or underfill

A fridge works best when it's at least two-thirds full and a freezer when it's at least three-quarters full. The more empty space you have, then the more energy you'll use in cooling the air inside.

The reason for this is simple. The cool air spills out when the door is opened and the warm air coming in has to be chilled. This cost can really add up.

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*Keep refrigerators at least 66% full  
and freezers at least 75% full  
to increase efficiency.<sup>23</sup>*

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In a non-consumer environment, you can reduce this problem by filling up the empty space with airtight bottles filled with water. Airtight food containers filled with water also work well as you can stack them on top of each other.

This will keep your fridge and freezer at an even temperature and it will need less energy to run.



You should also distribute contents evenly for maximum cooling efficiency. Keeping your fridge well organised will also reduce the amount of time you have the door open.

**Overfilling your fridge increases energy demand as it inhibits air circulation. Likewise, underfilling a fridge can also increase the energy demand because more cool air is lost when the door opens.**

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<sup>23</sup> [EnergyCut.info/ausgrid-report](https://www.energy.gov/energy-cut/energy-cut-report)

## Changing the lighting in commercial fridges

Lights in commercial fridges don't just use energy – they also generate heat. This heat has to be chilled so it increases the costs of your refrigeration.

There are three ways to reduce this cost:

- If you have more than one light in the fridge, see how many you can remove and still see the food. The more lights you remove, the more money you'll save.
- Swap out heat-producing incandescent lighting and replace it with low heat-generating CFL or LED lights.
- You can also attach a sensor to the lighting to check that it only comes on when the fridge door is opened.



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24 Image via [www.blueairinc.com](http://www.blueairinc.com)



## Insulate your refrigeration equipment

Increasing numbers of retailers and small businesses with refrigeration units are insulating them at night. This keeps the cool air in, which saves money on running costs.

- Businesses with refrigerated display units are using thermal insulation blankets and insulation curtains.
- Installing well-fitted night blinds on open systems can significantly cut down your refrigeration energy use.<sup>26</sup>
- If you have fridges that are not accessed by customers, could you use insulating curtains all day? It's an easy way to save energy.
- Some supermarkets now have fully-enclosed refrigeration and freezer cabinets. These use far less energy than open display cabinets and they make shopping in the fridge aisle a less chilly experience.
- Businesses with open-top chest freezers are also using 'thermo-roller' insulation. The 'thermo-roller' insulation roll is used in European supermarkets, where Dutch research shows they have a payback period of 6–8 months. In those tests, annual savings equivalent to AUS\$2,430 were achieved when using a 'thermo-roller' on top of a 10-metre-length freezer.<sup>27</sup>



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*Installing night blinds on refrigeration equipment can save a lot of energy.*

If you are not yet using insulation of this kind, it would pay to talk to an insulation specialist or an EcoSmart Electrician about the options available to you.

<sup>25</sup> Image courtesy of Coles.

<sup>26</sup> [EnergyCut.info/refrigeration-save](http://EnergyCut.info/refrigeration-save)

<sup>27</sup> [EnergyCut.info/thermo-roller](http://EnergyCut.info/thermo-roller)

# Natural refrigerants

## What are natural refrigerants?

Natural refrigerants are naturally-occurring substances, such as:

- hydrocarbons (propane, iso-butane)
- CO<sub>2</sub>
- ammonia.

These substances can be used as cooling agents in refrigerators and air conditioners. In this regard, they can replace synthetic refrigerants such as HFCs.

### Unilever

Retailers large and small throughout Australia are benefiting from innovations in refrigeration. As an example, Unilever have been rolling out 4,000 Streets ice cream freezers that use a natural refrigerant - this improves the energy efficiency of those units by 10%.

As the world's largest producer of ice cream, Unilever has accelerated their global roll-out of freezer cabinets that use hydrocarbon natural refrigerants. To date, they have purchased 1.5 million of them and plan to purchase many more<sup>28</sup>



*This Unilever Streets ice cream freezer uses a hydrocarbon (HC) natural refrigerant and is approximately 10% more energy efficient than their previous model.*

<sup>28</sup> [EnergyCut.info/unilever-refrigeration](http://EnergyCut.info/unilever-refrigeration)





## How can natural refrigerants help to reduce your energy bills?

There are a number of major companies who are backing the switch towards energy efficient natural refrigerants. All of them distribute point-of-sale refrigerant units to small retail outlets.

The Coca-Cola Company, PepsiCo, Red Bull and Unilever have all joined forces to create the 'Refrigerants, Naturally!' initiative. They have been getting strong results.

**The Coca-Cola Company:** Since 2009, the Coca-Cola Company has rolled out 1.1 million HFC-free refrigeration units - 75% of these are more energy efficient than their HFC counterparts.<sup>29</sup>

**Unilever:** Unilever has purchased 1.5 million freezer cabinets that use natural hydrocarbon refrigerants. These are about 10% more energy efficient than the previous refrigerant.<sup>30</sup>

### What's in it for your business?

If a small retailer gets one of these energy efficient point-of-sale units, their energy costs will go down.

**Get someone who knows what they're doing!**

**If your business uses refrigeration, try to find a refrigeration engineer who understands natural refrigerant-based technology or energy efficient synthetic refrigerants. It could well save you money.**

If your business is offered ice cream freezers and other point-of-sale refrigeration units by third parties, ask them if they are using energy efficient natural refrigerants. If they are, it could result in lower energy bills for your business.

As natural refrigerants make more headway in the marketplace, keep a look out for how they can be used in your HVAC and refrigeration. It may help to bring down your energy costs in these areas.

<sup>29</sup> [EnergyCut.info/natural-refrigerants](http://EnergyCut.info/natural-refrigerants)

<sup>30</sup> [EnergyCut.info/unilever-refrigeration](http://EnergyCut.info/unilever-refrigeration)

## Natural refrigerants are the way of the future

There are currently 700 million domestic refrigerators around the world that use natural refrigerants.<sup>31</sup>

HCFC and CFC refrigerants will be banned in industrialised countries by 2020 and non-industrialised countries by 2030.<sup>32</sup> Australia has also committed to phasing down HFC refrigerants that have a high GWP.<sup>32</sup> As a result, the usage of energy efficient natural refrigerants and HFO refrigerants<sup>33</sup> will become far more commonplace in Australia. If you're thinking of purchasing refrigeration equipment, investigate natural refrigerant options.

## For more information

[RefrigerantsNaturally.com](http://RefrigerantsNaturally.com) has more details about the above initiative.

**The Australian Refrigeration Association:** The ARA is a strong advocate for energy efficiency and natural refrigerants here in Australia.



They represent organisations that utilise natural refrigerants in air conditioning and refrigeration equipment. As part of their outreach work, their website has a lot of information about the energy efficiency benefits of natural refrigerants and other sources of energy efficiency.

You can visit their site and find out about their work at [www.ausref.org.au](http://www.ausref.org.au)

If you want to find out more about natural refrigerants and their energy efficiency potential, you can also visit:

[hydrocarbons21.com](http://hydrocarbons21.com)

[R744.com](http://R744.com)

[ammonia21.com](http://ammonia21.com)

[R718.com](http://R718.com)

<sup>31</sup> [EnergyCut.info/hydrocarbons21](http://EnergyCut.info/hydrocarbons21)

<sup>32</sup> [EnergyCut.info/ipcc-report](http://EnergyCut.info/ipcc-report)

<sup>33</sup> GWP is 'Global Warming Potential'.

<sup>34</sup> HFO stands for Hydrofluoroolefin



## Invest & save

In 2012 Australians spent nearly \$2 billion purchasing and installing new refrigeration equipment. If that money had been spent on energy efficient alternatives, energy costs could have been significantly reduced.<sup>35</sup>

### Buying domestic refrigeration equipment for your workplace

If you're buying domestic refrigeration equipment for your workplace, it makes sense to buy the most energy efficient model possible. Before you buy, take into account the following:

- The energy star rating – every extra star on your fridge and freezer will save you up to 23% on its energy costs.<sup>36</sup> Buy a unit with as many stars as your budget allows.
- The energy star rating system now recognises refrigerators/freezers that are 'super-efficient'. As a result, they now show a rating out of 10 stars rather than the usual six.
- Two-door fridges should have at least three stars.<sup>37</sup>
- Upright freezers and chest freezers should have at least three stars.<sup>38</sup>
- Before you buy, make sure you compare the running costs of refrigeration units at the government's EnergyRating website: [EnergyCut.info/fridge-ratings](http://EnergyCut.info/fridge-ratings). You can also download their smartphone app for iPhone, iPad, Android and Windows phone formats via [EnergyCut.info/energy-ratings-mobile](http://EnergyCut.info/energy-ratings-mobile).

**Over a 10-year period, buying a 4-star fridge instead of a 2-star version can save you up to \$480 in electricity costs.<sup>39</sup>**



<sup>35</sup> Cold Hard Facts 2, p.85, prepared by 'The Expert Group' on behalf of the DCCEE.

<sup>36</sup> [EnergyCut.info/nsw-fridges-freezers](http://EnergyCut.info/nsw-fridges-freezers)

<sup>37</sup> [EnergyCut.info/nsw-fridges-freezers](http://EnergyCut.info/nsw-fridges-freezers)

<sup>38</sup> [EnergyCut.info/nsw-fridges-freezers](http://EnergyCut.info/nsw-fridges-freezers)

<sup>39</sup> [EnergyCut.info/appliances-fridges](http://EnergyCut.info/appliances-fridges) using an electricity tariff of \$0.259/kWh

## Buying commercial refrigeration equipment

With commercial fridges and freezers, you should look to replace any equipment that is more than 15 years old. Today's commercial refrigeration equipment is a lot more efficient than it was in the last century.

Here are a few things to take into account when planning any purchase of a commercial refrigeration set-up:

- In the first instance, a qualified technician should be consulted when you decide to commission new and upgraded refrigeration systems. They can make sure that you maximise the energy efficiency of your set-up.
- Enclosed refrigeration units with glass doors are far more efficient than those display cabinets that don't have them. Tests show that enclosed refrigeration units with glass doors reduce energy use by 30–68%.<sup>40</sup>
- Chest freezers are more efficient to run than upright freezers as the cold air does not 'fall out' when you open the door.
- The Australian Government has a webpage that assists you in choosing commercial refrigeration equipment. You can compare commercial refrigerators here: [EnergyCut.info/commercial-refrigeration-comparison](https://www.energycut.info/commercial-refrigeration-comparison)
- The ENERGY STAR® label scheme can also show you a wide range of commercial refrigeration options: [EnergyCut.info/energystar-commercial-fridges-freezers](https://www.energycut.info/energystar-commercial-fridges-freezers)
- A fridge unit that is cheaper to buy may end up costing your business a lot more money when you take the 10-year running cost into account.

**Important tip to remember:** Buy a system that is appropriate for your needs. Smaller is usually cheaper to run so try and avoid buying a commercial refrigeration system that's too large.



<sup>40</sup> Master Grocers Australia (MGA) and EnergyCut.info/comm-refrigeration



## Retrofitting commercial refrigeration equipment

If the cost of buying brand new equipment is beyond your current budget, you may want to consider retrofitting your old refrigeration unit.

Retrofit glass door systems are now available for existing 'open-front display' refrigerated cabinets. They have a number of benefits for retailers on a budget:

- They give the existing display a fresh new look.
- The company that installed the retrofit in the photo claims that the system reduces energy use by up to 75%.<sup>41</sup>
- By removing the chill factor in the fridge aisle, customers are more likely to linger longer.
- The retrofit doors are energy efficient.
- By encasing the existing display unit, your HVAC system no longer has to continually heat the fridge aisle. The HVAC savings can be significant.
- The retrofit system is easy to install and has minimal impact on trading.



*Retrofit glass doors fitted to 5-year-old Austral open-front merchandisers at Foodworks in Graceville Queensland<sup>42</sup>*

<sup>41</sup> [EnergyCut.info/artmaslen](http://EnergyCut.info/artmaslen)

<sup>42</sup> Photo courtesy of ART and Maslen Australia.

## What to do if the unit you're buying is not on the energy-rating website

If the refrigeration unit is not listed on the [EnergyCut.info/energy-rating-gov](http://EnergyCut.info/energy-rating-gov) website, find out how many watts it uses over a 24-hour period.

With this information, you can calculate the 10-year running cost:

- 1) Find out how many watts the unit uses over a 24-hour period.
- 2) Multiply that amount by 3,650 and you'll establish how many watts of power it will use over 10 years.
- 3) Divide this figure by 1,000 and you'll have how many kW that is.
- 4) Multiply that figure by how much you pay per kWh for electricity.  
This is your 10-year running cost.



## What to do if your supplier doesn't know how many watts the machine uses

If the company selling you the unit doesn't know how many watts the unit uses and this figure is not on the equipment itself, you have two choices:

- 1) Go to a more knowledgeable supplier who knows about the energy demand of the units that they sell; as well as the overall operating performance of their products.
- 2) Alternatively, you could ask your supplier if they could place a power monitor on the unit for 24 hours.

As was shown in 'Step 2 - Measure your energy use', power monitors are simple and cheap devices that enable you to measure the energy use and running costs of individual appliances. The supplier would need to plug the fridge into the power monitor and then plug the power monitor into the wall socket.

Over a 24-hour period, the power monitor will show how much energy that device is using and you can then calculate how much it costs to run. If the supplier doesn't own a power monitor, it would pay for you to buy one.



## Save money with coolrooms and cold storage

The Australian Institute of Refrigeration, Air Conditioning and Heating (AIRAH) have come up with some simple tips that will help you to maximise the energy efficiency of your coolrooms and freezer rooms. This information applies to small-and-medium-sized cool and freezer rooms that are found in businesses such as:



- food services (café, restaurant, shops, hotels)
- retail
- agriculture (dairy, fruit and veg, wine)
- food processing
- businesses involved in the cold-chain.

### The no-cost ways to save money with coolrooms and freezer rooms

#### Keep the room full

Keeping the room at close to its optimum storage capacity (66% for coolrooms and 75% for freezers) is more efficient than running a room half full.

Refrigerated product adds thermal mass and reduces a system's running time and cycling. Applying capacity control by using a variable-speed compressor reduces these issues. Be careful that stored stock does not block the airflow to and from the evaporators in the room.

#### Have a loading and unloading policy

When product arrives, you need to ensure that it doesn't warm up any more than necessary, so load it as quickly as possible into your freezer. Unfrozen items will freeze quicker if you separate and scatter them around your freezer (after the items are frozen, you can bring them back together in the same part of the freezer). You should also place high-turnover product near the doors for easy access. This will minimise the loss of chilled air.

## Keep the door closed

Ambient air entering the room causes a significant load on the system. The ingress of moisture in the air can cause frost to form on evaporators, products, ceilings and floors. Ensure doors are self-closing. Never chock them open; ensure they seal tightly and quickly. An audible alarm or flashing indicator is a great way to avoid inadvertently leaving a door open even fractionally. Use strip curtains wherever possible.

## Turn the lights off

Lights within a refrigerated space introduce a heat load onto the system. Lights should be turned off when the room is not occupied. This can be automated by occupancy sensors or door-limit switches. Note that building regulations require lights to be operable from within the room.

## Learn how to drive

Know how to control your system, select the highest operating temperature suitable for your product, and don't overuse your system. Normal design temperatures are typically coolrooms from 0-4 °C, and freezer rooms from -18 to -20°C.

The actual operating temperature set point should be selected on the optimum temperature and humidity required for the type of product being stored, and no colder. Over-cooling costs money. Regularly check and calibrate temperature sensors.

## Leaks cost money

Keep the refrigerants inside the system, monitor refrigerant use and eliminate all leaks.

### Alchester Village Quality Meats, VIC

"We put plastic strips on the inside of the fridge door – so that there is not a gust of cold air going out and a gust of hot air coming in," said Alchester Village Quality Meats co-owner Sean Hopkins. "This has reduced temperature loss so that an even temperature is maintained and the fridge doesn't have to work so hard."

"Now with our fridges and cabinets we might have a fluctuation of one degree and the motors kick in when they need to, so they're running much less." These changes are contributing to savings of \$2,000 a year in overall energy bills.<sup>43</sup>

<sup>43</sup> [EnergyCut.info/alchester-meats](http://EnergyCut.info/alchester-meats)





### Size really does matter

It is important to have a clear definition of the refrigeration space required for your business needs. Oversizing the rooms or equipment 'just in case' or selecting the 'next size up' will impose an initial capital-cost penalty and ongoing energy-cost penalty.

Specify exactly what you need and expect from your system.

Poorly specified systems tend to have the lowest capital costs but the highest operating costs, as well as the shortest useful life.

Ask your expert to pay particular attention to part-load energy performance during the system design.<sup>44</sup>

## The low-cost ways to save money with coolrooms and freezer rooms

### Validate the integrity of the room

Check for damage (inside and outside) to insulation or vapour barriers. Gaps between panels or around door seals all allow warm air to infiltrate and cold air to escape, wasting energy. Regularly inspect the rooms from inside with the lights off to see if external light can penetrate, showing any gaps, damage, worn seals or door misalignment. Hire a thermal imaging camera to identify hot spots due to gaps or inadequate, failed or compromised insulation in walls, floors and ceilings.



### Lighting systems

Sometimes lighting levels in these rooms are unnecessarily high for the actual use. Owners can consider de-lamping (removing some lights from use) or retrofit existing light fittings with low-power LED lights or compact fluorescent bulbs.

### Check the airflow to evaporators and condensers

Both the evaporators in the room and the condensers outside of the room need good unrestricted airflow. Lack of good air circulation makes the system work harder and longer; remove obstructions such as stock (inside) and vegetation or decorative covers (outside). Straighten bent fins.

<sup>44</sup> [EnergyCut.info/airah-cool-room](http://EnergyCut.info/airah-cool-room)

## Temperature and defrost management

Check the accuracy of the thermometer/thermostat/controller by regularly calibrating gauges, thermostats and thermometers against independently tested and approved instruments. Check timer settings on any automatic electric defrost – is the defrost on for too long or too often?

There are also some low-cost adjustments that should only be carried out by qualified technicians.

## Install a power meter

This is the first step to managing your energy use and saving your cash.

Upgrade controls – often a reasonably sized system with a significant power bill is controlled by a 10-year-old mechanical thermostat. Upgrade system controls and controllability using direct digital control (DDC) panels.

### Replacing your existing coolroom or freezer room

Where systems are old, dilapidated or based on out-of-date technology, replacement with a modern energy efficient solution is often the best long-term option.

This is particularly true for older CFC (R12) and HCFC (R22, R502) based systems.

### Tip Top (Wholesale) Butchers, VIC

Even with a tenfold increase in refrigeration demands after a move to larger premises, Tip Top Butchers saved 30% on energy by using expert refrigeration consultants for the design of advanced, fully-controlled and monitored refrigeration systems for their facility.<sup>45</sup>

<sup>45</sup> [EnergyCut.info/tip-top-butchers](http://EnergyCut.info/tip-top-butchers)



## Best practice for coolrooms and freezer rooms

Things are no longer done the way they always have been. Ask for best-practice options including the following:

- thicker insulation
- fast-closing automatic doors
- highly efficient refrigeration plant
- variable-speed compressors and fans
- natural refrigerant options
- application of secondary refrigerants for reduction of primary refrigerant charges
- volatile secondary refrigerants for reduced pumping power and improved humidity control
- reduced temperature differences across heat exchangers
- reduced compression ratios
- dual-stage compression
- low-energy LED lighting
- leak-tight pipe installation
- desuperheaters
- modern control and defrost strategies.

Ask the designer or contractor to identify the increased costs (from a standard package) and the running cost savings (compared to the standard package) over the expected life of the room or system. Also request a life-cycle cost (LCC) assessment.



## Maintenance for energy efficiency

Just like servicing a car or a delivery vehicle, maintaining refrigeration systems makes them work better for longer. Maintenance providers will:

- clean heat-transfer surfaces and air filters
- lubricate bearings
- check drive belts for tension and wear
- check operating temperatures and running currents
- check the refrigerant charge
- calibrate thermostats and controls
- perform a range of maintenance actions on fans, pumps and water-cooled condensers.

All of the above will keep your system running as smoothly and as cheaply as possible. Spending money on maintenance saves money on energy. Other maintenance benefits include a better storage environment for refrigerated product, increased system reliability (no business can afford stock loss due to system failure), and reduced noise, which may have been affecting staff, customers or neighbours.

Ask your maintenance provider or technician to routinely identify and discuss any low-cost adjustments that could be made to the system to improve its efficiency or reduce its energy consumption. Technical service providers are there to guide and inform you, so talk to them.<sup>46</sup>



<sup>46</sup> [EnergyCut.info/airah-cool-room](http://EnergyCut.info/airah-cool-room)



## System upgrades – investing in efficiency

### Upgrade the room

Improved insulation and air-tightness of the refrigerated space reduces thermal losses and eliminates infiltration of warm, moist outdoor air. Thermal insulation and vapour barriers in walls, floors and ceilings, automatic door-closers, door seals and high-speed closers, strip curtains, plastic doors, air locks, night curtains, cabinet doors and lids can all be used to reduce refrigeration loads.

The use of reflective coatings on external walls and roofs and thermal coatings on floors, as well as the use of compact fluorescents or LED lighting systems that are suitable for low-temperature operation, will all reduce energy consumption and internal heat loads. Linking the operation of the lighting system to occupancy sensors can also help to further reduce this energy use.

### Update the system technology

Many new technologies have been developed to save refrigeration energy, including: high-efficiency motors and variable-speed drives for compressors, pumps and fans; highly effective pipe insulation; electronic expansion valves; evaporators with staggered or wider fin spacing; larger condensers; internal heat exchanger surface enhancement; natural refrigerant-based systems; direct digital controllers and smart monitors; refrigerant containment strategies; and automatic fault detection and alarm systems.

#### Ask your expert about drop-in components

**Many manufacturers now offer new energy efficient components (including variable-speed compressors, high-efficiency motors, electronically commutated (EC) fans, and entire condensing units) that are designed to be retrofitted into existing plants and systems.**

**These can offer an easy low-cost pathway for energy efficiency upgrades.**

## Refrigerant leak detection

Depending on the system size and refrigerant type, refrigerant leakage presents a financial, safety and energy efficiency risk for owners. The installation of an automatic refrigerant detection system can help to reduce these risks.

Refrigerant detection within very cold or well-ventilated areas may be technically difficult, but detectors can be installed around plant and at high-risk leakage points. Some systems can incorporate low-liquid-level alarms, and maintenance protocols should always include regular leak surveys.

**Refrigeration systems are mechanically intensive; they shake, they break and they leak refrigerants. Leaks lead to less refrigerant in the system, which then has to work harder to achieve the target temperature. That extra workload increases the energy consumption of the unit and reduces the efficiency.**

**Average refrigerant leakage rates in Australian commercial refrigeration systems can be up to 12-15% per year.<sup>47</sup>**

**That's why maintenance is so critical. It reduces energy bills, make systems run better and saves on the cost of replacing leaked refrigerant.**

## Heat recovery

Refrigerant desuperheater waste-heat-recovery systems can recycle rejected heat from a refrigeration system and use it to heat water or other fluids, while lowering refrigerant temperature and pressure, and so reducing energy input.

Pre-heating water reduces the energy required for water heating while increasing the efficiency of the refrigeration system. Desuperheaters can be applied to any refrigeration system with reciprocating, rotary, scroll or screw-type compressors.

These desuperheaters are best installed on systems that have high annual cooling run-times and at sites that have a constant heating requirement. Greater amounts of waste heat are available from older, less efficient equipment.<sup>48</sup>

<sup>47</sup> Source: The Expert Group

<sup>48</sup> [EnergyCut.info/airah-cool-room](http://EnergyCut.info/airah-cool-room)



## Further information about commercial refrigeration



When it comes to getting more information about buying, repairing or maintaining refrigeration equipment, you should always liaise with a qualified technician.

You can find one via this searchable database from the Australian Refrigeration Council (ARC) at: [EnergyCut.info/arc-search](https://www.energycut.info/arc-search)

When you book a technician to install or fix refrigeration equipment, you can check that they hold a valid licence by visiting this website: [EnergyCut.info/licence-check](https://www.energycut.info/licence-check)

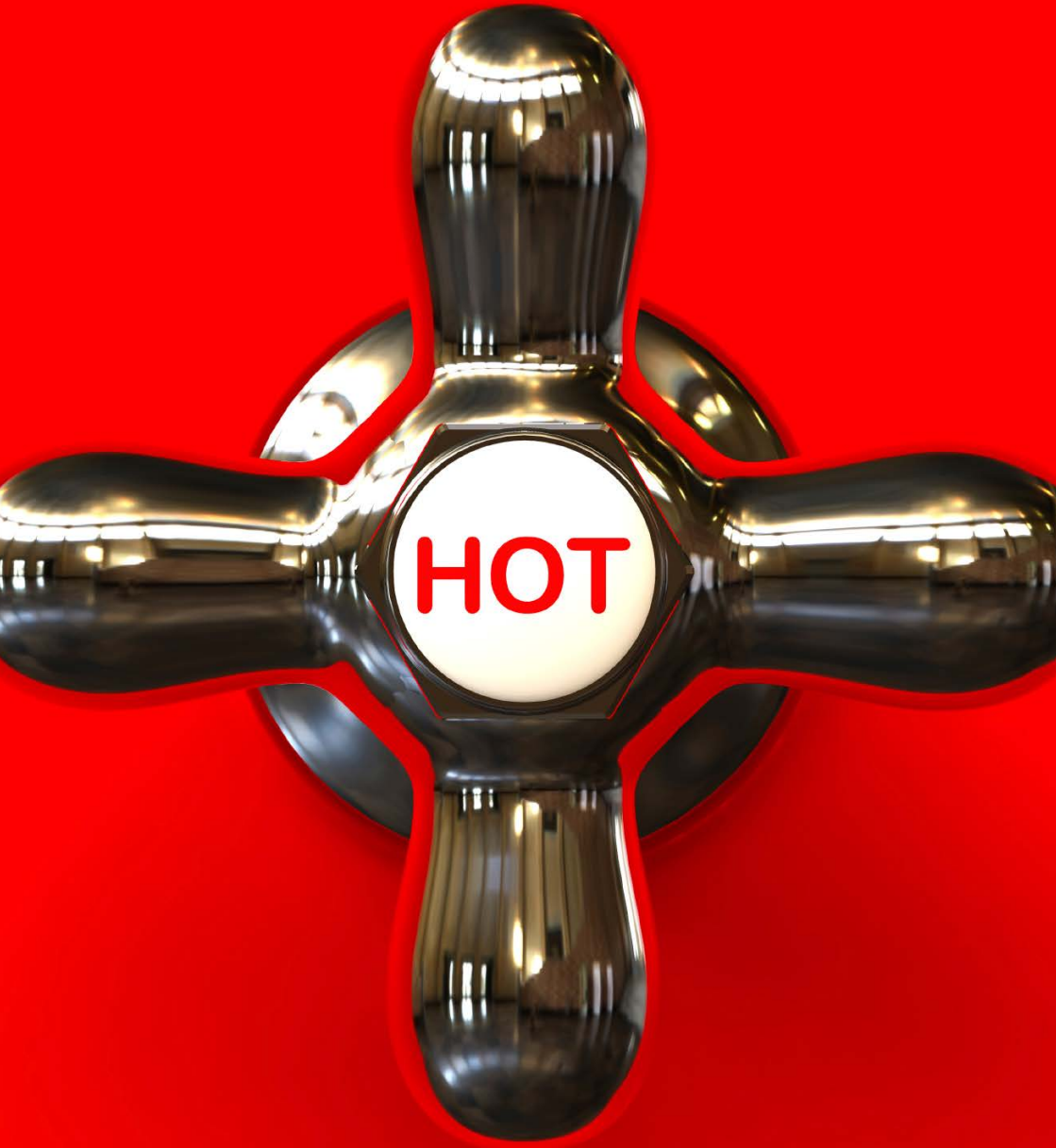
You can also find an EcoSmart Electrician via [EnergyCut.info/eco-smart](https://www.energycut.info/eco-smart)

### ALDI, locations around Australia

ALDI are well-known for their widespread use of energy efficient chest freezers – 100% of their chest freezers and bread shelves also use LED lights.

They use night blinds on their chillers to conserve energy and are transitioning to more energy efficient natural refrigerants, many of which reduce refrigerant and HVAC energy bills.<sup>49</sup>

<sup>49</sup> [EnergyCut.info/dosomething-research](https://www.energycut.info/dosomething-research) & ALDI



**HOT**





## STEP 15

# Reduce hot water costs

Boiling a kettle full of water uses enough energy to power an energy efficient fridge for four hours.<sup>1</sup> Reducing this cost is simple. If you're having one cup of tea, you should only boil that amount of water.

The same principle applies to wherever you use hot water in your business. You need to use the least amount possible. The cost of heating water is significant for many companies, so reducing hot water usage can really save money.

The method by which you generate heat for your hot water system can also have a big impact on your bottom line.

For the businesses who currently use electric storage systems, switching to a heat pump or solar hot water system (boosted by gas or electricity) can make a real difference.

If your business wants to reduce its hot water costs, this section will show you how.

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*If you need professional hot water advice, hire an EcoSmart Electrician or a licensed plumber with energy efficiency experience.*

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<sup>1</sup> [EnergyCut.info/dosomething-research](http://EnergyCut.info/dosomething-research)



# Did you know?

## Step 15: Hot water

Boiling a kettle full of water uses enough energy to power an energy efficient fridge for four hours.

See page 371

Hot water is often unnecessarily overheated, costing you money. Storage hot water systems need to be set to at least 60°C in order to stop bacteria breeding, but there is no need to go any higher than 65°C. Instant hot water systems can be set at 50°C.

See page 379

If your hot water system is electric, make sure it's heating your water during off-peak periods when it's cheaper.

See page 380

If your business doesn't require hot water around the clock, turn off systems and pumps when they won't be used for an extended period, such as holiday seasons or even over long weekends. Be sure to turn on systems at least two hours before hot water is required so it is sufficiently heated and to prevent diseases.

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**When you put an aerator or flow restrictor onto an existing tap, you can restrict the water flow to less than a third of standard taps.**

**See page 380**



**See page 394**

**The 'Water Efficiency Labelling Scheme' (WELS) can tell you which products are more water efficient than others. Devices receive a rating to a maximum of six stars.**

**See page 381**

**A dripping tap can waste more than 2,000 litres of water a month. Left unfixed, that's 24,000 litres of water a year. If it's a hot water tap, that's a lot of money going down the drain.**

**See page 385**

**Heat pump hot water systems use 60%-70% less electricity than conventional electric water heaters.**

**See page 394**

**According to Sustainability Victoria, solar hot water can reduce hot water bills by up to 75%.**

**See page 392**



# In this step

## No cost/low cost

- ▶ Get an expert to help you reduce your hot water costs
- ▶ Where can you cut down on using hot water?
- ▶ Set the water temperature correctly
- ▶ Heat your water in off-peak periods
- ▶ Install flow regulators and sensors on your taps
- ▶ Install a plug timer on hot water dispensing units
- ▶ Service and maintain hot water systems
- ▶ Shower facilities in your business
- ▶ Look out for leaks
- ▶ Use insulation to keep hot water hot
- ▶ Locating your hot water system in the right place

## **Invest & save**

- ▶ **What to do when a hot water system breaks down**
- ▶ **Install a solar hot water system**
- ▶ **Install a heat pump hot water system**
- ▶ **Install a gas hot water system**
- ▶ **Look for the money-saving stars on gas hot water systems**
- ▶ **Utilising instant hot water systems**
- ▶ **Websites that help you buy energy efficient hot water equipment**

# No cost/low cost

## Get an expert to help you reduce your hot water costs

If your business uses a lot of hot water, you need to bring in an expert, someone who can determine the most efficient products and appliances for your current and future hot water needs.

If your existing plumber is not familiar with the latest innovations in hot water efficiency, you should hire an accredited EcoSmart Electrician or a plumber with energy efficiency skills and experience.

When hiring someone, ask them if they have been trained in:

- hot water heating installation (including solar thermal and PV, heat pumps, and natural gas hot water)
- water-efficient products
- water conservation
- leak identification and fixing
- emerging water efficiency products and technologies.





## Finding a hot water expert

You can find an accredited EcoSmart Electrician via: [EnergyCut.info/eco-smart](https://www.energycut.info/eco-smart)

You can locate a licensed plumber via the following links:

**NSW – Master Plumbers Association of NSW**

[EnergyCut.info/plumbers-nsw](https://www.energycut.info/plumbers-nsw)

**VIC – Master Plumbers Association**

[EnergyCut.info/plumbers-vic](https://www.energycut.info/plumbers-vic)

**QLD – Master Plumbers' Association of Queensland**

[EnergyCut.info/plumbers-qld](https://www.energycut.info/plumbers-qld)

**WA – Master Plumbers & Gasfitters Association of WA**

[EnergyCut.info/plumbers-wa](https://www.energycut.info/plumbers-wa)

**TAS – The Master Plumbers' Association of Tasmania**

[EnergyCut.info/plumbers-tas](https://www.energycut.info/plumbers-tas)

**ACT – Master Plumbers ACT**

[EnergyCut.info/plumbers-act](https://www.energycut.info/plumbers-act)

**SA & NT - Master Plumbers South Australia**

[EnergyCut.info/plumbers-sa-nt](https://www.energycut.info/plumbers-sa-nt)

### Eastern Road Quality Meats, NSW

Eastern Road Quality Meats saved energy by converting from electric hot water to instant gas hot water.

They reduced their hot water costs even further by installing an epoxy resin floor on top of the existing concrete floor. This makes the floor easier to clean and degrease. They now use 90% less hot water to clean the floor. It used to require 200 litres of hot water a day to clean; now it's using just 20 litres.

It also takes a lot less time to clean the floor, so they save on staff time as well.<sup>2</sup>

<sup>2</sup> [EnergyCut.info/butcheries-case-study](https://www.energycut.info/butcheries-case-study)

## Where can you cut down on using hot water?

The first rule with hot water is to reduce its use as much as possible.

In the past, laundromats always used hot water but the introduction of specialist cold water detergents means that most loads can be washed in cold water.

You can also run dishwashers with cold or reduced-temperature water.

Wherever your business uses hot water, try and switch to:

- cold water
- water that is not as hot, or
- reduce the amount of hot water that you use.

### Hot water signage

**Put up signs near your kettles that remind people to only boil the water they need. If they only want one cup of tea, they should only boil slightly more than one cup's worth of water.**

**Dishwashers can also have a sign on them reminding staff to run them only when they're full and on an 'eco' setting that reduces hot water use.**

**Ask for input from employees on what other reminders could be put near your other hot water devices and appliances.**



### Elle & Stuart, VIC

Boutique clothing shop Elle & Stuart saved money by switching off their inefficient hot water equipment.

“Why does a small business like mine need hot water?” said owner Maureen Bourke. So she switched it off – a simple step that has saved the business a significant amount on electricity bills.<sup>3</sup>

<sup>3</sup> [EnergyCut.info/retailers-case-study](https://www.energycut.info/retailers-case-study)





## Set the water temperature correctly

Is your hot water system still on the original factory setting? If so, you may be heating your water more than you need to.

Hot water systems often overheat water and in doing so cost you money. If your system has an adjustable thermostat, you may be able to save money by reducing the temperature.

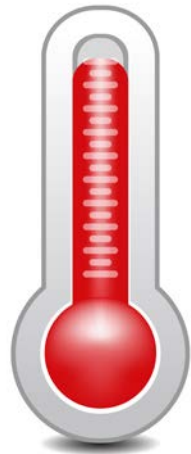
Storage hot water systems need to be set to at least 60°C in order to stop bacteria breeding. However, there is no need to go any higher than 65°C. Instant hot water systems can be set at 50°C.

If you're unsure about what to do, get professional advice from a licensed plumber or EcoSmart Electrician. The next time they come in to maintain your hot water system, they can check the temperature and if necessary adjust it for you.



### What if the boiler has no temperature reading?

**If there is no temperature reading on your water boiler, run your hot water tap for five minutes over a water thermometer. That will tell you how hot your water is. If it's well above 60–65°C, you can turn down the boiler thermostat until you get the correct reading at the tap.**



## Heat your water in off-peak periods

If your hot water system is electric, make sure it's heating your water during off-peak periods when it's cheaper.

If you're not sure what to do, talk to your energy company or get professional advice from a licensed plumber or EcoSmart Electrician.



### When to switch off hot water systems

**If your business doesn't require hot water around the clock, turn off systems and pumps when they won't be used for an extended period, such as holiday seasons or even over long weekends. Be sure to turn on systems at least two hours before hot water is required so it is sufficiently heated and to prevent diseases.**

## Install flow regulators and sensors on your taps

When you install a flow regulator or sensor on a tap, you can help to restrict excessive hot water flow. This will reduce your hot water costs.



Normal taps can use up to 18 litres of water a minute, however when you install a low-flow or an aerating tap, you can reduce the flow down to as little as 2 litres per minute.<sup>4</sup> When you put an aerator or flow restrictor onto an existing tap, you can restrict the water flow to less than a third of standard taps.<sup>5</sup>

Flow regulators are inexpensive to buy and are available at hardware and plumbing supplies stores. They can be self-installed, but if you're not confident in such matters, get a plumber to do it for you the next time they're doing maintenance work at your business.

<sup>4</sup> [Energycut.info/govt-water-efficiency](http://energycut.info/govt-water-efficiency)

<sup>5</sup> [Energycut.info/govt-water-efficiency](http://energycut.info/govt-water-efficiency)



Installing an electronic sensor on a tap is another way to reduce the excessive use of hot water – particularly in bathrooms where people might leave a hot water tap running.

### Water efficiency labelling (WELS)

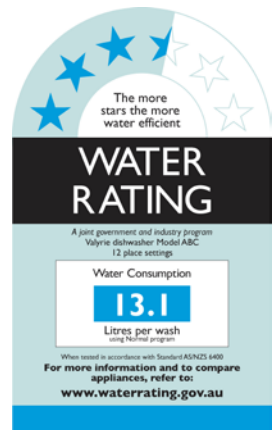
The ‘Water Efficiency Labelling Scheme’ (WELS) can tell you which products are more water-efficient than others.

**Taps:** You can find out the water consumption of tap equipment by the star rating and brand at the WELS product search page:

[EnergyCut.info/wels-taps-comparison](https://www.energycut.info/wels-taps-comparison)

**Flow controllers:** You can find out the water consumption of flow controllers by the star rating and brand at the WELS product search page:

[EnergyCut.info/wels-flowcontroller-comparison](https://www.energycut.info/wels-flowcontroller-comparison)



## Hair On Wilkes, NSW

Hair On Wilkes has installed flow restrictors on its spray taps which save energy on hot water without compromising the customer’s experience.<sup>6</sup>

<sup>6</sup> [EnergyCut.info/hair-wilkes](https://www.energycut.info/hair-wilkes)

## Install a plug timer on hot water dispensing units

Many companies have urns and instant water boilers in their kitchens. Although they give you instant hot water, they cost a lot more than they need to if you leave them on at night and over weekends.

Buying a \$8-\$20 electrical plug timer can reduce this cost. You can program it to:

- switch off at the end of each working day
- turn off on weekends
- turn on just before people arrived at work.



### Steplight, NSW

Steplight<sup>7</sup> used a \$25 plug-in power meter to measure the energy use of their combined water cooler/heater dispenser.

After recording its energy use over a 24-hour period, the meter showed it would cost about \$245 a year to run the dispenser unit. However, by using a \$20 plug-in appliance timer, this figure could be reduced to approximately \$166 a year – a reduction of \$79 per annum.<sup>8</sup>

If your premises have a hot water dispenser in the kitchen or staff areas, make sure you utilise a plug-in appliance timer. The payback period is extremely short.

<sup>7</sup> Steplight is an organisation that assists communities in reducing their resource usage and environmental impact.

<sup>8</sup> [EnergyCut.info/steplight-water](http://EnergyCut.info/steplight-water)



## Service and maintain hot water systems

ENERGY STAR research indicates that improved boiler maintenance can lead to energy savings of up to 10%.<sup>9</sup>

Ensuring that your hot water heaters are properly maintained and serviced according to the manufacturer's instructions will ensure they're running at optimum efficiency.



Draining and flushing your water heater can also optimise its lifespan. Your plumber can advise you on how regularly this needs to be done.

## Shower facilities in your business

If you have shower facilities for employees, install water-efficient showerheads.

An inefficient showerhead can use up to 25 litres of hot water a minute. A WELS 3-star rated showerhead, however, can use as little as 7 litres a minute.<sup>10</sup> Replacing an inefficient showerhead can therefore save you up to 18 litres of hot water every minute.

Many people take up to eight minutes to shower, so the hot water savings from water-efficient showerheads become substantial in a very short space of time.

### Did you know?

**You can save up to 18 litres of water per minute in the shower by replacing your old showerhead with an efficient one?<sup>11</sup>**

**That's a lot of hot water (and money) not going down the drain.**

<sup>9</sup> [EnergyCut.info/boiler-maintenance](https://www.energycut.info/boiler-maintenance)

<sup>10</sup> [EnergyCut.info/efficient-showerheads](https://www.energycut.info/efficient-showerheads)

<sup>11</sup> [EnergyCut.info/efficient-showerheads](https://www.energycut.info/efficient-showerheads)

Water-efficient showerheads cost anything from \$30–\$90. Research shows that they can cut shower-related hot water costs by up to 47%,<sup>12</sup> so they're a very sensible low-cost investment. Better still, a good 3-star-rated showerhead can give your employees a shower that's just as good as the old water-guzzling type.

All staff should also be encouraged to keep their showers to four minutes in length. The shorter the shower, the more money you'll save on water-heating costs.

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***A standard showerhead uses about 15–25 litres of water per minute – a 3-star-rated water-efficient showerhead uses as little as six or seven litres per minute.<sup>13</sup>***

*– WaterRating.gov.au*

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<sup>12</sup> [energycut.info/govt-water-efficiency](http://energycut.info/govt-water-efficiency)

<sup>13</sup> [energycut.info/govt-water-efficiency](http://energycut.info/govt-water-efficiency)



## Look out for leaks

A dripping tap can waste more than 2,000 litres of water a month. Left unfixed, that's 24,000 litres of water a year.<sup>14</sup> If it's a hot water tap, that's a lot of money going down the drain.

The solution? Fixing a leaking tap needs a \$1 tap washer and advice from your local hardware store as to how to install it. Many hardware stores teach this skill in after-hours education evenings. You can also check out this instructional video from Save Water at [EnergyCut.info/change-a-washer](https://www.energycut.info/change-a-washer)

Alternatively, you can get your plumber to fix it and then check all your other water devices for leaks when they're next doing maintenance work.

**Water posters:** Place posters around your business that give a phone number or email so people can report leaks in places that use hot water. This includes dripping hot water taps, ZIP boilers, urns and water boilers.

**Do you have an old water boiler?** If you have an old water boiler, it's worth looking to see if it (or the pipes linked to it) are leaking hot water. When this happens it can cost you a lot of money in increased energy bills.

### Regular Servicing

**Ensure your hot water service is looked at by a qualified professional on a regular basis. This will ensure a faulty pressure or release valve is not responsible for continual water leaks and increased energy consumption.**

**Can you recover and reuse wasted heat?** If you use a lot of hot water, equipment is available that takes the heat from wasted hot water to preheat incoming cold water. This helps to reduce your water-heating bills. Ask your plumber or existing supplier for professional advice.



<sup>14</sup> [EnergyCut.info/tap-leak](https://www.energycut.info/tap-leak)

## Use insulation to keep hot water hot

If your hot water system is a long way from where the hot water is used, you can lose heat in the water pipes. If you can't move your hot water system, you should insulate the hot water pipes with R1-rated insulation that is at least 10mm thick. This will help to minimise heat loss.



Insulating your electric hot water storage tank will also reduce heat loss and save money.<sup>15</sup> Implementing this can:

- reduce standby heat losses by 25–45%, and
- save about 4–9% in water heating costs.<sup>16</sup>

One way to do this is with an insulation jacket: [EnergyCut.info/insulation-jacket](https://www.energycut.info/insulation-jacket)

If your business has exposed external hot water pipes, then it pays to have these insulated as well. The ‘Victorian Employers Chamber of Commerce and Industry’ (VECCI) estimates that fitting insulation to 100mm pipework could save you up to 800kWh per metre.<sup>17</sup> The insulation lagging is only \$40 per metre so the savings quickly add up, especially if you have a few metres of exposed piping.

They also estimate that insulating a hot 100mm flanged valve could save up to 800kWh. An insulated jacket for a valve costs about \$160, so the return on this is usually within a short time frame.

Fitting this insulation is quite easy, but it can also be done by your maintenance contractor the next time they check your hot water system. Just remember to give notice that you want this insulation installed.

<sup>15</sup> Warning: This type of insulation must not be carried out on gas water heaters.

<sup>16</sup> [EnergyCut.info/insulation-jacket](https://www.energycut.info/insulation-jacket)

<sup>17</sup> [EnergyCut.info/pipe-insulation](https://www.energycut.info/pipe-insulation)





### Heat losses from hot water systems

Insulating your hot water set-up is very important. According to [YourHome.gov.au](http://YourHome.gov.au), heat loss from hot water storage tanks and the associated fittings and pipes is substantial:

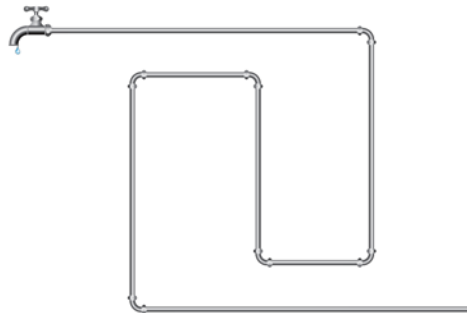
- large electric storage tanks and their fittings can waste up to 1,000kWh each year
- this is equivalent to the energy required to heat 50–60L of hot water each day

The above figures are only for home-based hot water set-ups. If you use bigger uninsulated hot water systems, the heat losses will be higher still.<sup>18</sup>

## Locating your hot water system in the right place

In many businesses, the hot water system is located too far away from where the water gets used. This has two disadvantages:

- you waste water waiting for the hot water to arrive
- excessive pipe length can lead to loss of water heat in the pipe system



### Choosing the right location

Origin Energy advises that hot water systems should be installed close to kitchen and bathroom facilities or utilities that require regular hot water. This ensures that taps do not have to run too much cold water before the hot water comes through.

For this reason, pipe runs should be kept as short as possible in order to minimise hot water heat loss.<sup>19</sup>

<sup>18</sup> [EnergyCut.info/yh-hot-water-service](http://EnergyCut.info/yh-hot-water-service)

<sup>19</sup> [EnergyCut.info/origin-hot-water](http://EnergyCut.info/origin-hot-water)

## Invest & save

### What to do when a hot water system breaks down

When a hot water system breaks down, the priority is to get your hot water supply back up and running immediately.

When this happens, the need to get hot water back on, often comes well ahead of the need to buy an efficient hot water system. However, it does not have to be this way.

If your hot water system breaks down, some companies can install a temporary water heater to supply your business. This will give you time to choose and install a solar hot water or heat pump system of your choice.

In the event of a breakdown, here are the questions to ask an installer:

- Can they install a temporary water heater to give you time to choose and install an energy efficient hot water system? If not, you may want to find a supplier who will – after all it's your company that will have to pay the ongoing hot water bills.
- Are all installation costs included in the quote?
- Is the installer appropriately qualified? Any system that requires an electricity supply will need a licenced electrician and plumber involved in the fitting. Similarly, if a natural gas hot water system has been chosen, your installer must be qualified to fit it.



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***If your hot water system breaks down, an installer can give you a temporary water heater until a solar or heat pump system can be installed.***

---



### **Buy devices that are appropriate for the task**

**Choose hot water units that meet the demands you place on them.**

**A water heater with a high energy efficiency rating that's too big for your needs could use more energy and cost you more than a smaller water heater with a lower efficiency rating.**

**The trick to saving money is to get the right size water heater with the highest energy efficiency rating.**

### **Ferguson Plarre, VIC**

At Ferguson Plarre Bakehouses the hot water required for cake production is preheated by energy recovered from their refrigeration systems. They have installed a 'liquid chocolate tank' whose hot water utilises heat that's been reclaimed by their heat system. Saving even further on hot water, they have a pie meat pump delivery system that also uses heat recovery technology.<sup>20</sup>

### **Install dedicated units**

**If different parts of your business require significantly different water temperatures, it may be more efficient to install separate heaters for high-temperature and low-temperature areas.**

**This will reduce costs associated with heating large quantities of water to higher temperatures than required.**

### **Fresh & Clean Uniform Services, NSW**

Fresh & Clean Uniform Services saved money by simplifying their washing processes.

"Our normal wash cycle used to require a break wash, a hot wash and three rinses," said owner Steve Gordon. "All of that required large amounts of energy to heat the water, lots of chemicals to remove grease and lots of water in each wash cycle."

The new alternative is a lot simpler. "We now dry-clean and rinse the garments once," said Steve.<sup>21</sup>

<sup>20</sup> [EnergyCut.info/dosomething-research](https://EnergyCut.info/dosomething-research) and [EnergyCut.info/ferguson-hot-water](https://EnergyCut.info/ferguson-hot-water)

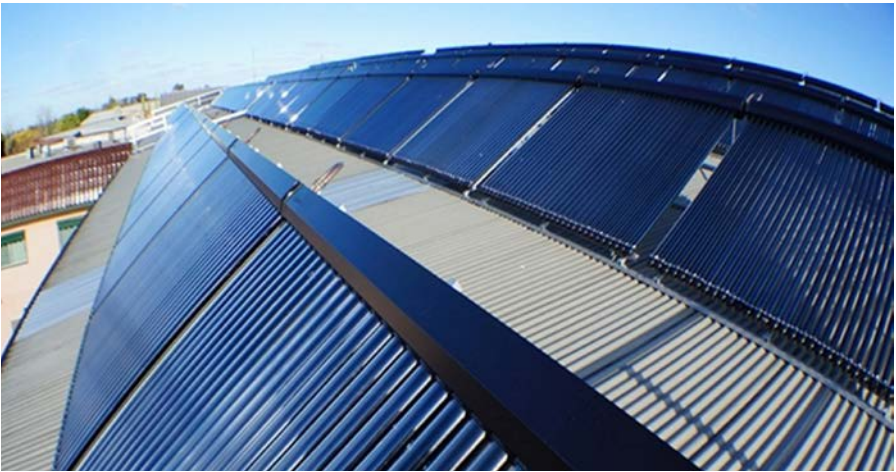
<sup>21</sup> [EnergyCut.info/dosomething-research](https://EnergyCut.info/dosomething-research)

## Install a solar hot water system

For many businesses, solar hot water systems can reduce their hot water bills by hundreds of dollars every year. With larger systems, it can save thousands of dollars.

When you mention solar hot water, many people think of the small traditional household solar hot water system. However, with solar hot water systems you can go as large as you like.

De Bortoli Winery has a 3,000 Apricus evacuated tube solar hot system that can preheat up to 12,000 litres of water.<sup>22</sup> This huge set-up makes it the largest solar hot water system at a winery in Australasia.



*De Bortoli winery in Griffith, NSW*

If you aren't using a solar hot water system, you should check out how much they could save your business. The bigger your solar hot water system, the bigger your savings can be.

- According to Sustainability Victoria, solar hot water can reduce hot water bills by up to 75%.<sup>23</sup>
- When getting a solar hot water system, a gas-boosted system is currently cheaper to run than one that's boosted by electricity. However, with increases in gas prices, this may change. In remote areas, LPG gas can also be used to boost your solar hot water system, but this can be more expensive still.

<sup>22</sup> [EnergyCut.info/de-bortoli](https://EnergyCut.info/de-bortoli)

<sup>23</sup> [EnergyCut.info/susvic-solar-water](https://EnergyCut.info/susvic-solar-water)



## Why should you have electric or gas to back your solar hot water system?

During a period of cloudy or overcast weather, having the electric or gas booster attached to your solar hot water system can guarantee you'll get hot water.

When it's cloudy, it's handy to have this booster on hand. However, during the summer period, you will rarely need this back-up.

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*If you have an electric-boosted solar hot water system, check with your energy retailer to see if you can connect it to an off-peak electricity plan.*

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## Solar hot water is a proven technology

The first solar hot water system was used in Australia in 1941. This technology is primarily used to heat household hot water, but it can also be used by businesses too.

In 2015 there were 737,307 solar hot water systems<sup>24</sup> in operation in Australia, so you won't be alone if you make the switch.

Department of Industry and Science has a useful guide for people who want to switch to solar hot water heaters – you can check it out here: [EnergyCut.info/solar-water-heat-guide](https://www.energycut.info/solar-water-heat-guide)

### Alice Springs Veterinary Hospital, NT

Alice Springs Veterinary Hospital installed a solar hot water system with a circulating pump, so there is no wait time to get hot water from the pipes.

This saves on energy costs and reduces water waste and inconvenience.<sup>25</sup>

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<sup>24</sup> [EnergyCut.info/renewables-stats](https://www.energycut.info/renewables-stats)

<sup>25</sup> [EnergyCut.info/alice-springs-vet](https://www.energycut.info/alice-springs-vet)

## Advice for purchasing and installing solar hot water systems

When you decide to get a solar hot water system, check with your local retailer/installer for details of any government incentives that will help you to make the switch.

Then shop around for two or more quotes. Ask the solar hot water retailers to identify any government incentives and grants that are included in their quotes.

A retailer or installer will need to take the following into consideration when giving you a quote:

- how much hot water you use (this will dictate the size of the system you need)
- whether you have enough roof space
- whether your roof can support the system you need
- whether the orientation of your roof will suit a solar hot water system
- what kind of auxiliary boost you will need

Finally check whether their warranty includes frost protection.

For detailed advice about purchasing a solar hot water system, visit the following:

- Clean Energy Council fact sheet advice for purchasing solar hot water and heat pump systems: [EnergyCut.info/cec-solar-fact](https://www.energycut.info/cec-solar-fact)

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*According to Sustainability Victoria,  
solar hot water can reduce hot water bills  
by up to 75%.<sup>26</sup>*

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## What type of solar hot water systems exist?

The EnergyRating.gov.au website has the following advice regarding the two different types of solar hot water systems.<sup>27</sup>

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<sup>26</sup> EnergyCut.info/susvic-solar-water

<sup>27</sup> This text is reproduced with permission from: EnergyCut.info/solar-types



## Flat plate panels

Flat plate panels have been used for around 40 years and are common around Australia. They operate at maximum efficiency when the sun is directly overhead at midday but are less efficient at other times of the day when the sun's rays hit the panels at different angles.



Flat plate panels:

- may require a special anti-freeze fluid for very low temperatures
- are generally less expensive than evacuated tube systems.

## Evacuated tube systems

Evacuated tube collectors use an array of glass tubes that insulate in a similar way to a thermos flask where the heat energy is retained in the tube. This makes them more efficient at retaining heat throughout the day and when the sun is not directly overhead.

They can be much more efficient than flat plate panels in some conditions, such as cold climates. The technology was invented in Australia in the late 1980s and the collectors have been fully commercialised in the last decade.



Evacuated tube systems:

- make more efficient use of the sun's energy
- are lightweight and can be easily installed on the roof
- can withstand very low temperatures without the need for an anti-freeze fluid
- are generally more expensive than flat plate panels
- can have individual tubes replaced if damaged.

## Eco Wash Coin Laundry, VIC

Hot water is a big user of energy at any laundromat. After investigating all the best options, Eco Wash Coin Laundry installed solar hot water evacuated tubes which is a less expensive way to heat water than gas or electricity.

They saved even more energy by giving customers three wash options, with the coldest wash being the least expensive (\$4 for a cold wash, \$5 for warm and \$6 for hot). This gives their customers extra motivation to wash with cold water.<sup>28</sup>

<sup>28</sup> EnergyCut.info/ec-wash-coin

## Install a heat pump hot water system

Some businesses can't use solar hot water systems because:

- they don't have a north-facing roof
- their building is surrounded by trees, or
- they want solar hot water but don't have access to gas to boost the system.

In such situations, heat pump hot water systems are ideal. They use 60%-70% less electricity than a conventional electric water heater.<sup>29</sup>

They work like a refrigerator in reverse. Using a heat exchange system, a heat pump hot water system takes heat out of the air and uses it to heat water. They're so efficient that they can even heat water on a winter's night.

They are simple to install and can reheat your water within as little as three hours. There are currently 187,056 heat pump hot water systems in use around Australia, so if you get one installed, you'll be using tried and tested technology.<sup>30</sup>

The Department of Industry has a useful guide for people who want to switch to heat pump hot water heaters - you can check it out here: [EnergyCut.info/heat-pump-water](https://www.energy.gov.au/energy-cut/info/heat-pump-water)



### Milner Meat & Seafood, NT

Milner Meat & Seafood saved 60% on heating water, or \$850 a year, simply by replacing their electric hot water with a heat pump hot water system. This system saves energy as it extracts heat from the air and transfers it to the hot water tank.

This type of technology can reduce hot water costs by up to 60%-70%.<sup>31</sup>

<sup>29</sup> [EnergyCut.info/heat-pump-saving](https://www.energy.gov.au/energy-cut/info/heat-pump-saving) and News Corp

<sup>30</sup> [EnergyCut.info/clean-energy-report](https://www.energy.gov.au/energy-cut/info/clean-energy-report)

<sup>31</sup> [EnergyCut.info/milner-meat-seafood](https://www.energy.gov.au/energy-cut/info/milner-meat-seafood)





## Install a gas hot water system

If the installation of a solar or heat pump hot water system does not meet your needs, you can install a natural gas water heater system.

These are currently more cost-effective than existing electric hot water heaters and come in two types – instant gas hot water systems<sup>32</sup> and gas hot water storage systems.

When buying a gas hot water system, buy a system with a minimum 5-star rating.

When investigating this option, do bear in mind that the price of gas is increasing, so the financial savings that have been there in the past may not continue over the life of the system.

A qualified plumber can advise you as to which one of these will give you the most cost-effective hot water for your type of business.

You can also use LPG gas where natural gas is not available, but according to CHOICE, this is more expensive than natural gas or electricity.<sup>33</sup>

The Department of Industry and Science has a useful guide for people who want to switch to gas water heaters – you can check it out here: [EnergyCut.info/gas-water-heater-guide](https://www.energy.gov.au/gas-water-heater-guide)

You can also compare the different gas hot water heaters at the EnergyRating.gov.au website: [EnergyCut.info/energy-rating-gas-hot-water](https://www.energyrating.gov.au/gas-hot-water)



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***When installing a gas hot water system,  
make sure you protect the pilot light  
from draughts.***

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<sup>32</sup> Gas instant hot water systems are sometimes called 'continuous hot water'.

<sup>33</sup> [EnergyCut.info/gas-hot-water](https://www.energycut.info/gas-hot-water)

## Look for the money-saving stars on gas hot water systems

Electrical appliances are not the only things with energy-rating stars. Gas hot water systems have them too.

Gas labels give you a star rating for energy efficiency – they also give you the annual energy consumption of the product with a MJ (megajoules) per year figure. You should look out for appliances that have a maximum number of energy-rating stars and the lowest MJ figure.

For more information and advice on buying energy efficient gas hot water heaters go to [EnergyCut.info/gas-hot-water](http://EnergyCut.info/gas-hot-water)



**When buying a gas hot water system, buy a system with a minimum 5-star rating**

## Utilising instant hot water systems

Some businesses, like hairdressers, need guaranteed hot water all the time. Other businesses only need hot water occasionally. If either of these scenarios sounds applicable, you may need a gas or electric instant hot water system.

This type of system only consumes energy when it's being used. If you buy a gas instant hot water system, you should look for one that has at least six stars. According to CHOICE, gas models with electronic ignition are more economical than units with a pilot light.<sup>34</sup> You can also run them with natural gas or the more expensive LPG.



Research by Sustainability Victoria shows that gas instant hot water systems are cheaper to run than their instant electric counterparts (see the hot water costs table). One of the reasons for this is that instant electric water heaters have to be connected to the day rate tariff.

<sup>34</sup> Source: CHOICE



The cheapest option however is solar hot water that's boosted by electricity or gas. It's far cheaper to run than instant hot water.

If you are using hot water in different parts of your building, get a licensed plumber to advise on whether it's more cost-effective to:

- install multiple instant hot water systems, or
- one big hot water storage system with piping.

### Hot water costs – 250 litres of hot water per day<sup>35</sup>

Water heater type	250L/Day – Cost per annum
Gas storage – natural gas (5 to 3 Star)*	\$434–\$516
Gas instantaneous – natural gas (6 to 4 Star)*	\$406–\$494
Gas storage – LPG (5 to 3 Star)*	\$991–\$1,180
Gas instantaneous – LPG (6 to 4 Star)*	\$927–\$1,129
Electric storage – peak tariff	\$1,609
Electric instantaneous – peak tariff	\$1,337
Electric storage – off peak tariff	\$1,035
Solar/natural gas boosted+	\$209
Solar/electric boosted – off peak tariff+	\$399
Solar/gas – LPG boosted+	\$442
Heat pump – peak tariff^	\$644
Heat pump – off peak tariff^	\$414

Based on energy tariffs of: natural gas (1.75 c/MJ), LPG (4 c/MJ), peak electricity (28 c/kWh), off-peak electricity (18 c/kWh).

\* All gas hot water systems are star rated – the more stars the more energy efficient they are and the cheaper to run.

+ Based on a 70% solar contribution at rated delivery. Costs of 100 L/day based on unit with small rated delivery, and costs for all other uses based on a unit with a large rated delivery.

^ Based on a 60% solar contribution at rated delivery.

<sup>35</sup> Source - Sustainability Victoria: [EnergyCut.info/hot-water-leaflet](http://EnergyCut.info/hot-water-leaflet) and [EnergyCut.info/sv-hotwater](http://EnergyCut.info/sv-hotwater)

## Urban Escape Hairdressers, VIC

Urban Escape Hairdressing runs four separate instant hot water systems installed underneath and very close to the basins. When the tap is off, there is no electricity being used so they are not wasting energy on heating water unnecessarily. This has significantly cut their hot water energy costs.<sup>36</sup>

## Websites that help you buy energy efficient hot water equipment

When you reduce the amount of water that you heat, you reduce the size of your energy bill. To achieve this, there are websites that help you to choose water-efficient fittings and appliances.



Apart from an inexpensive device like a flow regulator, here are the other ways to save money:

### Water Efficiency Labelling Scheme (WELS)

The 'Water Efficiency Labelling Scheme' (WELS) can tell you which products are more water efficient than others. Devices receive a rating to a maximum of six stars. More stars mean less water is used and there is an associated saving on water and energy costs – particularly when you're using hot water.

When it comes to hot water, the label currently applies to washing machines, dishwashers, showers, taps and flow controllers. The WELS label also shows you how much water is used.



<sup>36</sup> [EnergyCut.info/urban-escape-hairdressers](http://EnergyCut.info/urban-escape-hairdressers)



You can search and check out these WELS-rated products via these links:

**Taps:** [EnergyCut.info/wels-taps-comparison](https://www.energycut.info/wels-taps-comparison)

**Flow controllers:** [EnergyCut.info/wels-flowcontroller-comparison](https://www.energycut.info/wels-flowcontroller-comparison)

**Showers:** [EnergyCut.info/wels-shower-comparison](https://www.energycut.info/wels-shower-comparison)

**Dishwashers:** [EnergyCut.info/wels-dishwasher-comparison](https://www.energycut.info/wels-dishwasher-comparison)

**Clothes washing machines:** [EnergyCut.info/clothes-washer-comparison](https://www.energycut.info/clothes-washer-comparison)

### Electric hot water systems

If you're buying an electric hot water system, the government's Energy Rating website enables you to compare the different models at this page: [EnergyCut.info/electric-hot-water-systems](https://www.energycut.info/electric-hot-water-systems)

When it comes to your existing electric hot water system, check with your plumber whether a solar retrofit or heat pump hot water system is a better way to go.

### Gas hot water systems

If you're buying a gas hot water system, the government's Energy Rating website enables you to compare the different models at this page: [EnergyCut.info/energy-rating-gas-hot-water](https://www.energycut.info/energy-rating-gas-hot-water)

### Water heater advice

The Australian Government has a useful guide for people who want to switch to energy efficient water heaters – you can check it out here: [EnergyCut.info/yh-hot-water-service](https://www.energycut.info/yh-hot-water-service)

### Energy Ratings label

When buying new hot water appliances, like washing machines and dishwashers, you should also check the Energy Rating label. You can compare the different models and running costs at this page: [EnergyCut.info/energy-rating-comparison](https://www.energycut.info/energy-rating-comparison)







## STEP 16

# Save money with solar

**Solar photovoltaic (PV) panels are a great way to reduce your energy bills.**

Since 2008, the cost of solar PV panels has fallen by 80%.<sup>1</sup> Government incentives such as ‘Small-scale Technology Certificates’ (STCs) and ‘feed-in’ tariffs have also provided financial assistance for people who have invested in solar power.

As a result, there has been a surge in the installation of solar PV panels – they now generate electricity on more than 1.41 million rooftops around Australia.<sup>2</sup> According to the Australian PV Institute, Australia now has over 4GW of rooftop solar PV – a four-fold rise since 2011. Every year, we’re now generating an estimated 5,250GWh of electricity from the sun.<sup>3</sup>

Solar is a great way to future-proof your business against rising energy prices and it’s being used by more and more companies. In a February 2013 survey, 79% of Australian SMEs understood that using solar could reduce their energy bills, and 60% of them said they had also considered using solar energy in their business.<sup>4</sup>

If you haven’t yet done so, why not install solar and start saving? This section will show you how to make the switch. It will also tell you all you need to know about storing solar power in batteries.

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1 [EnergyCut.info/economy-report](http://EnergyCut.info/economy-report)

2 [EnergyCut.info/CER-solar-uptake](http://EnergyCut.info/CER-solar-uptake)

3 [EnergyCut.info/apvi-data](http://EnergyCut.info/apvi-data)

4 Research carried out by Colmar Brunton for My AGL IQ in February 2013.



# Did you know?

## Step 16: Solar

The federal government's 'Small-scale Technology Certificates (STCs)' reduce the cost of solar PV systems by around 20-30%.

See page 407

Since 2008, the cost of solar PV modules has fallen by 80%.

See page 401

Solar PV panels now generate electricity on more than 1.41 million Australian rooftops. We now have over 4GW of rooftop solar PV – a four-fold rise since 2011.

See page 401

You can receive funds for the excess solar energy that you export to the grid. These 'export price' offers are usually available through your electricity retailer.

See page 405



See page 405

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Rather than exporting excess solar power to the grid, new solar battery storage systems allow you to store that power on-site and use it in your own business during peak price electricity periods.

See page 417



See page 417

When you buy a solar PV system, you can expect a payback period of 5-7 years. As the panels should last for 25 years, when your payback period is over they should continue reducing your power bills for at least another 18-20 years.

See page 407

All solar PV panels being installed in Australia must be certified and approved to Australian Standard AS/NZS 5033. They must be capable of producing 90% of their output after 10 years and 80% after 25 years.

See page 414

There are three types of solar panels – ‘Tier 1’, ‘Tier 2’ and ‘Tier 3’. Panels made by a ‘Tier 1’ manufacturer are deemed to be the best – they are well made, reliable, durable and high performing.

See page 409

The Clean Energy Council (CEC) has so far accredited 4,500 solar PV panel installers. Anyone installing your solar panels needs to be one of them.

See page 410



# In this step

- ▶ **What is the difference between solar PV and solar hot water?**
- ▶ **What financial assistance is available?**
- ▶ **What tax breaks are available for solar?**
- ▶ **Advice for purchasing and installing solar PV systems**
- ▶ **Questions to ask a solar installer**
- ▶ **Make sure your solar equipment meets Australian standards**
- ▶ **Your solar PV post-installation checklist**
- ▶ **Want more information?**



## What is the difference between solar PV and solar hot water?

### Solar PV

Photovoltaic technology turns the free energy of the sun into electricity. At the moment, it's mainly found on rooftops where it powers individual buildings.

This form of energy has really taken off – solar PV now generates electricity on more than 1.41 million buildings around Australia.<sup>5</sup>

Solar PV can reduce power bills and protect small businesses against energy price rises.

You can use the solar energy that you generate within your own business. This can help to reduce your usage of 'peak period' grid electricity.

You can also sell your excess solar energy back to the grid and receive an 'export price'. These 'export price' offers are usually available through your electricity retailer.



### Solar hot water

Solar hot water systems are the main type of low temperature solar thermal technology currently being used in Australia. Solar thermal technology has been in use since 1941 and there are now 737,307 solar hot water systems installed in Australia.<sup>6</sup>

More and more small businesses are now using solar hot water to save energy and reduce bills. More information on solar hot water is included in 'Step 15 - Reduce hot water costs'.



<sup>5</sup> [EnergyCut.info/CER-solar-uptake](http://EnergyCut.info/CER-solar-uptake)

<sup>6</sup> [EnergyCut.info/CER-solar-uptake](http://EnergyCut.info/CER-solar-uptake)

## Mt Barker Country Bakery, WA

Owners at the Mount Barker Country Bakery in Western Australia enlisted the help of Albany Solar to overhaul their energy set up. The Bakery's average electricity bill was \$2,500 per month. The first phase was to install LED lighting and



replace a 120 litre electric storage hot water system with two Chromagen Midea 280 litre heat pumps. These changes resulted in a 20% reduction in their overall energy use.

The second phase involved installing a 51kW solar system on their rooftop. This resulted in a further saving of 25% over the year.

Due to the reduced amount of grid power needed the owners were then able to renegotiate a better energy tariff. This renegotiation was the third phase of their overhaul and saved them an impressive 25%.

The cost savings have been significant giving them a good return on investment and a payback period of under three years. When compared to the previous year, before the energy overhaul, in the month of December (the busiest period) the energy cost saving was a huge 70%.

"Our energy costs were getting out of control, we had to do something." said Michael Dunbrell, the owner. "It was a large investment for us to make but after comparing our electricity bills over a one year period we can now see the true effect and we are very happy."

7 Source DoSomething & Albany Solar



## What financial assistance is available?

When it comes to reducing the cost of your solar installation, you can take advantage of ‘Small-scale Technology Certificates’ (STCs).

### ‘Small-scale Technology Certificates’ (also called ‘solar credits’)

When installing solar PV, the main financial incentive is the federal government’s ‘Small-scale Technology Certificates’ (STCs). They reduce the cost of solar PV systems by around 20-30% and are available for systems up to 100kW.<sup>8</sup>



Most companies that sell solar PV systems include this government financial incentive in their pricing. As they handle all the paperwork, this makes it easier for you to get the benefit of cheaper solar power.

### Export prices

With your solar PV system you can be paid an export price where you receive income for your excess solar energy. These offers are usually available through your electricity retailer. Before you proceed, call up your local electricity retailers to see how much they’re prepared to offer for your excess solar energy.

If you want to check out the solar offers that are available from electricity retailers, you can also visit the government’s Energy Made Easy comparison website at [EnergyCut.info/eme-solar-offers](https://www.energy.gov.au/eme-solar-offers)

Both of these incentives make solar power more affordable. They will also save your business money, both now and into the future.

#### Solar payback

**When you buy a solar PV system, you can expect a payback period of 5-7 years. As the panels should last for 25 years, when your payback period is over they should continue reducing your power bills for another 18-20 years.<sup>9</sup>**

<sup>8</sup> Source: Solar Business Services

<sup>9</sup> ROI depends on the solar-set-up installed and the cost of your electricity supply.

## What tax breaks are available for solar?

Generally speaking, there are no direct tax incentives available for solar PV systems. However, if you finance or purchase a system through a business then you can potentially make taxation savings through depreciation and claim deductions for the cost of financing.



The ATO has specific advice on solar PV and how it might affect your tax rates. You should also seek advice from your accountant or a taxation expert.

### Eastern Road Quality Meats, NSW

Eastern Road Quality Meats, a busy butcher's shop on Sydney's North Shore, installed 8kW of solar PV panels on its roof. This has contributed towards an annual 25% reduction in its energy bills.<sup>10</sup>

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***“The payback period of solar energy projects is conventionally 5-7 years. In investment terms, that’s a 16% annual return. Given today’s cash investment rates of less than 3%, we would claim that these energy efficient investments are far superior than leaving money in the bank.”<sup>11</sup>***

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<sup>10</sup> EnergyCut.info/butcherries-case-study

<sup>11</sup> Andrew Randall, Easy Being Green



## Advice for purchasing and installing solar PV systems

When your company decides to purchase and install a solar PV system, it pays to research who you're dealing with:

- Look for a company with a strong track record.
- Ensure that the company uses quality products. See below 'What are the best quality solar PV panels?'
- Check the fine print of their warranty and service offerings (make sure it matches the verbal assurances given to you by their salesperson).
- Look at the products and services that are included in their offer.
- Look for online reviews of the equipment you're looking to purchase. *Photon* magazine, for example, provides independent reviews for most products sold in the Australian market.

As with many other products and services, when it comes to solar PV, you tend to get what you pay for. If you are choosing the lowest cost option, make sure that you do your homework to ensure that you're getting a good system.

### What are the best quality solar PV panels?

**If you want to buy high-quality solar panels, ask your supplier if the panels are made by a 'Tier 1' brand name manufacturer.**

**When a panel is classed as 'Tier 1', it means that it is well made, reliable, durable and high performing. There are two other tiers, so if you cannot afford 'Tier 1' solar panels, look for reputable 'Tier 2' models.**

**Tier 1 and 2 are better made than Tier 3 panels and are more likely to perform better over a longer period of time.**

**The Australian Solar Council has just started rolling out the 'Positive Quality' program to provide consumers with peace of mind regarding the solar components that they buy. PQ labels will be found on modules that have been audited by the program. As this program is new and growing, check their site on a regular basis: [www.positivequality.com.au/module-search/where-can-i-buy-modules-pq-suppliers/](http://www.positivequality.com.au/module-search/where-can-i-buy-modules-pq-suppliers/)**



## Are they accredited?

In order to be eligible for government incentives such as ‘Small-scale Technology Certificates’ (STCs) your supplier will need to be accredited by the Clean Energy Council.

The Clean Energy Council (CEC) has so far accredited 4,500 solar PV panel installers.

You can find a CEC approved installer here: [EnergyCut.info/find-an-installer](https://www.energycut.info/find-an-installer)

## Want more advice about installing solar?

For detailed advice about purchasing a solar PV system, visit the following:

- Clean Energy Council advice for purchasing solar PV:  
[EnergyCut.info/purchasing-a-solar-system](https://www.energycut.info/purchasing-a-solar-system)
- Australian Government Clean Energy Regulator advice for choosing solar panels: [EnergyCut.info/CER-choosing-solar-panels](https://www.energycut.info/CER-choosing-solar-panels)

### Gray’s Bakery, VIC

At their regional bakery in Victoria, Gray’s Bakery installed a 10kW solar PV system on their roof. Inspired by the success of this, they intend to add an additional 10kW of solar. Along with other energy efficiency steps, co-owner Janine Gray says they are saving “thousands of dollars” a year.<sup>12</sup>

<sup>12</sup> [EnergyCut.info/dosomething-research](https://www.energycut.info/dosomething-research) & [EnergyCut.info/grays-bakery-case-study](https://www.energycut.info/grays-bakery-case-study)





## Questions to ask a solar installer

When it comes to installing solar PV or solar thermal at your business, here are a few questions that you need to ask.

### Questions for solar PV and solar hot water systems

- Can you provide a written quotation?

**Tip:** If you decide to proceed, don't agree to anything until you receive a formal contract of sale detailing all the terms and conditions.

- How long have you been in business and how many installations have you carried out?
- Is there a deposit required and what are the refund conditions? (If a deposit is required, this should not be more than 10% of the overall cost).
- What is your policy if the date you promise to deliver and install the equipment is not met?
- Do you offer a warranty on the equipment? Can the warranty be extended? Is it backed by an insurer or a distributor in the event that the manufacturer becomes bankrupt?

**Tip:** When comparing different quotes, compare the length of the warranties being offered. You should look for a minimum 10 years on the panel and 5 years on the inverter. Also check if the manufacturers of the equipment have an office in Australia. This could be useful if something goes wrong.

- What happens if a repair is needed during the warranty period? Who handles this?
- Do you install yourself or use subcontractors?
- If you use subcontractors and something goes wrong, who is responsible?
- Can you provide me with references for installations that you've undertaken for businesses in my area?
- Do you provide a maintenance plan for systems that you install?

- Will you come back in six months to check that the installation is working as claimed and generating the right amount of power? If not, can you put in a monitor so I can check the system is working properly?
- Will shading from trees or buildings lower the performance of this solar equipment?
- Does the price being quoted include all available rebates and grants? If it does, are you handling all the associated paperwork for them?
- Is the price fixed or will you charge extra if you run into difficulty during the install or identify a problem at a pre-install inspection?
- How long will it take for the system to pay for itself?

## Additional questions for solar PV

- What size of solar PV system do you recommend and how much electricity will it be able to generate?

**Tip:** If you want to self-consume the energy produced by the solar panels, let the installer know how much energy you use and when you're using it throughout the day. This may affect their system recommendation.

- Can I expand the number of solar panels at a future date?
- What brand of panels are you proposing to install? Are they 'Tier 1', 'Tier 2' or 'Tier 3'?
- What brand of inverter are you proposing? Does it meet Australian standards and what warranty do you offer with it?
- What commitments will you provide to ensure the system is connected to the electricity grid?
- Is the cost of electricity metering included? If not, how much will it cost and who is responsible for arranging it?
- Who is responsible for negotiating with the electricity retailer to get the best deal for me? What help can you provide, if I am responsible for this?
- If something goes wrong, what costs might I be expected to pay for?



### What if you're renting your business premises?

**If you are renting your business premises, you can still install solar and take it with you when you leave. Ask permission from your landlord to install solar on the proviso that you leave the premises in the same condition you found them. Given that solar panels can last 25 years, this will allow you to reap the full benefit of your solar PV investment.**

#### Yass Soldiers Club, NSW

To counter their huge demand for energy and faced with 40% increases in energy costs, Yass Soldiers Club installed a 100kW solar PV system.

“We were looking at an expected electricity bill of \$200,000 for 2013-14 and that was just not sustainable as we want the venue to grow alongside the community,” said General Manager Robert Packwood.

He expects the solar installation to absorb 20-25% of the club's annual energy needs and to have paid for itself within five years. In the 2013-14 financial year, the electricity bill ended up being \$120,335 and their solar system generated the equivalent of \$48,394 of electricity.

“The panels are expected to last for 25 years, so the financial savings over time are going to be very significant,” he said. “In terms of ROI, it's turning out to be an extremely good investment.”<sup>13</sup>



<sup>13</sup> [EnergyCut.info/yass-soldiers-club](http://EnergyCut.info/yass-soldiers-club)

## Make sure your solar equipment meets Australian standards

### Solar PV panels

The majority of the world's solar panels are made in China. Although most are made to a very high standard, some aren't.

The Clean Energy Council website has a list of solar PV panels that are compliant with Australian Standard AS/NZS 5033 and approved for use in Australia:

- All solar PV panels being installed in Australia must be certified and approved to this standard.
- The panels being installed need to be capable of producing 90% of their output after 10 years and 80% after 25 years.

This list for approved solar panels is available here:

[EnergyCut.info/cec-solar-modules](https://www.energycut.info/cec-solar-modules)



### Paperbark Merchants, WA

Newsagency and bookstore, Paperbarks, made energy efficiency changes which led to savings of approximately \$20,000 per year. A major component of these changes was the installation of a 10kW solar PV system and a full replacement of their extensive lighting set up with LED lighting.

Paperbarks Owner Hamish Cameron said his was the first commercial enterprise in Albany to uptake solar and he can't believe all businesses who are able to do it, don't.

"Compared to having money sitting in the bank, it's the best ROI in just two years. It's a no-brainer."<sup>14</sup>

<sup>14</sup> [EnergyCut.info/dosomething-research](https://www.energycut.info/dosomething-research)



## Solar Inverters

In order to use solar electricity in your business, you first have to link an ‘inverter’ to your solar panels. This converts the panels DC (direct current) electricity to AC (alternating) power. This is what you need to power your appliances and equipment.

The Clean Energy Council maintain a list of inverters that are approved for use in Australia and meet the relevant safety standards.

Your solar installer will install this for you. The same principles apply to inverters as solar panels; look for quality brand(s) from established suppliers and be clear about who has imported them.

The list of approved inverters can be found here: [EnergyCut.info/cec-solar-inverters](https://www.energycut.info/cec-solar-inverters)

### Can you enter into a solar ‘Power Purchase Agreement’?

**Some companies will do a deal where they install a solar system on the rooftop of a business and sell them the electricity it produces. This is called a solar ‘Power Purchase Agreement’ (PPA).**

**According to the NSW Office of Environment and Heritage, PPAs are emerging as a new finance option for commercial scale solar, following their popularity in international markets, particularly the U.S. Like solar leasing, PPAs can lower your electricity bill with little or no upfront cost.**

**One of the key differences is that while you pay by the month for a solar lease, under a PPA, payment is made for each kilowatt-hour of electricity that is produced by the solar system. With a PPA, it therefore makes sense to ensure that you can fully use the electricity generated by the solar system.**

**Under a PPA, a company agrees to install and maintain a solar system and the customer enters into a long-term contract to purchase the electricity generated by the system at a given price. The price should be lower than the retail price of electricity from the grid.**

**For more information on solar ‘Power Purchase Agreements’, check out the OEH Solar Finance Guide at [www.environment.nsw.gov.au/business/solar-finance-guide.htm](http://www.environment.nsw.gov.au/business/solar-finance-guide.htm)**

## Your solar PV post-installation checklist

Once your solar PV system has been installed, you should check that:

- you have received all necessary documentation from your accredited installer including an operation manual and warranty documentation
- your electricity network provider and retailer have been advised and have approved the installation and the meter has been changed or properly reconfigured
- the correct solar tariff has been applied to your electricity bill by your energy retailer
- the energy generation display on your inverter is regularly checked to ensure your solar system is working correctly.

### Kindarama Long Day Care Centre, NSW

Kindarama installed a 40kW solar PV system with over 200 panels. Kindarama owner Peter Brown said that choosing solar power as a preferred renewable energy source made sense due to the business being open from 7.00am to 6.00pm five days a week.

“Solar energy reduces our power costs significantly and with the sun and our business operating at the same time, it supplies our daytime energy use,” he said. “This helps us to control our running costs and impacts the stability of pricing and fees for childcare.”<sup>15</sup>

## Want more information?

You can keep up to date with the Australian solar industry and developments in solar technology by reading the Australian Solar Council's 'Solar Progress' magazine:

[EnergyCut.info/solar-progress](https://www.energycut.info/solar-progress)



<sup>15</sup> [EnergyCut.info/kindarama-centre](https://www.energycut.info/kindarama-centre)



## Keep an eye out for solar battery storage

Rather than exporting excess solar power to the grid, solar batteries allow you to store that solar power on-site to use it in your own business during times of expensive peak price electricity.



I recently bought a solar battery storage system from [EasyBeingGreen.com.au](https://www.EasyBeingGreen.com.au) for my home-based business. It's the size of a small fridge and contains plug-in batteries that are recharged by the solar panels on the roof. It can power my whole house and home office for 4 hours during the peak period when grid electricity is at its most expensive. This system also gives me the flexibility to add more batteries at a future date. This is useful as the cost of these lithium-ion batteries is coming down in price.

During winter when there can be less sunshine, I can also recharge these batteries overnight with cheap off-peak electricity. I can use this cheaper stored energy to replace the more expensive grid electricity during the peak period of the day.

By reducing the usage of expensive peak electricity, this technology is making a real dent in the energy bills of my home-based business.

### When will the time be right to use solar battery storage?

**Battery storage costs are forecast to come down quickly. Over the next few years, this technology will become cheaper and far more mainstream.**

**According to the Office of Environment and Heritage, packaged battery storage and solar PV can already be cost effective for business in regional locations (or companies with high backup power requirements). Storage is particularly viable for businesses that are off-grid or where costs of obtaining or augmenting grid connection are high.**

**Many businesses are realising that battery storage systems for solar PV will have the potential to significantly reduce peak electricity costs. The Office of Environment and Heritage has published an online guide to the latest developments on battery storage. You can check it out at [environment.nsw.gov.au/business/solar-battery-storage.htm](https://environment.nsw.gov.au/business/solar-battery-storage.htm)**





# LEASE AGREEMENT

...reement is made between \_\_\_\_\_, telephone no. \_\_\_\_\_, and \_\_\_\_\_

... AND TENANT AGREE AS FOLLOWS

... and the Tenant leases from the \_\_\_\_\_ terminating on \_\_\_\_\_







## STEP 17

# Energy efficiency and your building lease

**If your business doesn't own its premises, then why not talk to the facility manager, agent or owner about making your building more energy efficient?**

Improving the energy efficiency of a building can have real benefits for the building owner. In a world of rising energy prices, improving the building's energy efficiency will make it more attractive to future tenants who are looking to reduce their running costs.

You could also look to negotiate what is called a 'green lease'. This is where the tenant and the building owner look at ways they can jointly reduce the energy usage of the premises.

These initiatives are then included within the lease agreement. Such a move can be a financial win/win for both parties. In some cases, the financial savings from energy efficiency improvements and reduced energy use can be shared between the tenant and the building owner.

This section provides you with links to where you can get advice on setting up these kind of agreements.

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***Energy efficiency improvements of existing commercial buildings could deliver energy savings of 37% and achieve a positive long-term return on the investment.<sup>1</sup>***

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<sup>1</sup> [EnergyCut.info/cefc-finance](http://EnergyCut.info/cefc-finance)



# Did you know?

## Step 17: Building lease

Energy efficiency improvements of existing commercial buildings could deliver energy savings of 37% and achieve a positive long-term return on the investment.

See page 419

**Improving a building's energy efficiency can benefit both the owner and the tenant.**

**From the owner's point-of-view, a building that is cheaper to do business in is more attractive to future tenants.**

See page 419

Organisations can get the most out of a 'green lease' when contemplating office relocation and negotiation with a new landlord, but they can also be entered into by existing tenants.

See page 423

A 'green lease' is an arrangement where the tenant and the building owner look at ways they can jointly reduce the energy usage of the premises. These initiatives are then included within the lease agreement.

See page 419



See page 427

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See page 426

**'CitySwitch'** provides lots of useful information and tips on best-practice leasing.

See page 426

According to 'CitySwitch', 'green leases' do not necessarily cost any more than regular leases.

See page 423

If a building has a NABERS energy rating, this will give you information about its energy efficiency performance.

See page 424

The goal of CitySwitch is to help businesses to reduce energy operating costs by achieving a 4-star or higher NABERS energy rating. They have also been at the forefront in the push for 'green leases'.

See page 426



See page 425



# In this step

- ▶ Where can you get more information about 'green leases'?
- ▶ Why not move into a NABERS-rated building?
- ▶ Is your local council linked to the 'CitySwitch' program?



## Where can you get more information about ‘green leases’?

Organisations can get the most of out a ‘green lease’ when contemplating office relocation and negotiation with a new landlord, but they can also be entered into by existing tenants.



To make it easier for businesses to find out more about leases that include energy efficiency clauses, the federal government has published a ‘Tenant’s Guide to Green Leases’ and a ‘Green Lease Handbook’ for landlords.

The tenants guide tells you all you need to know about the benefits of incorporating energy efficiency clauses into a lease agreement. The Landlord edition explains the benefits that they will receive as the owner of the premises.

You can download them both from here: [EnergyCut.info/tennants-guide-green-leases](https://EnergyCut.info/tennants-guide-green-leases) and [EnergyCut.info/green-lease-handbook](https://EnergyCut.info/green-lease-handbook)

‘CitySwitch’ also provides lots of useful information and tips on best-practice leasing.

For more information: visit [EnergyCut.info/city-switch-leases](https://EnergyCut.info/city-switch-leases)

### Will a ‘green lease’ cost more?

**According to ‘CitySwitch’, ‘green leases’ do not necessarily cost any more than regular leases. This type of lease may require behaviour changes from the tenants, which some could see as a cost.**

**However, the operational and energy efficiency savings that are gained by these leases should outweigh any management costs and perceived inconvenience.<sup>2</sup>**

## Why are many small businesses not taking out ‘green leases’?

Green leasing practices have not yet been widely adopted by small business occupiers, largely due to a lack of awareness of the benefits and positive impact these practices can have on their bottom line.

Simple initiatives such as requiring the Landlord to upgrade to LED lighting, installing lighting motion sensors and selecting a building with efficient base building services, will reduce a small business Tenant’s OPEX costs over the life of the lease.

<sup>2</sup> [EnergyCut.info/tennants-guide-green-leases](https://EnergyCut.info/tennants-guide-green-leases)

“The small businesses that are first to implement sustainable green leasing practices will not only realise financial savings, but will also benefit from reduced absenteeism, increased productivity and stronger levels of staff attraction, retention and engagement,” said Tristan Gannan the Associate Director of CBRE Global Corporate Services.<sup>3</sup>

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***Organisations can get the most out of a ‘green lease’ when contemplating office relocation and negotiation with a new landlord, but they can also be entered into by existing tenants.***

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## **Why not move into a NABERS-rated building?**

If you're an office-based small business, the 'National Australian Built Environment Ratings System' (NABERS) can help to save money the next time you move your business to new offices.



If a building has a NABERS energy rating, this will give you information about its energy efficiency performance. When a building has a higher rating, you'll use less energy and have lower energy bills than if you were in a similar-sized building with a lower rating.

You can also ask your existing landlord to join the NABERS scheme so that you can better assess the energy efficiency rating of the building you are currently in.

You may find that there is potential to significantly improve the energy savings for both parties. To find out more: visit [EnergyCut.info/nabers](https://EnergyCut.info/nabers)

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<sup>3</sup> Information kindly provided by Tristan Gannan | Associate Director CBRE | Global Corporate Services



## Why should you move into a NABERS rated office building?

NABERS Energy rates the energy efficiency of buildings and tenancies from 1 to 6 stars based on energy consumption per square metre.

- 6 stars represents an exceptionally high level of energy efficiency.
- With the average tenancy performing at 2½ stars, a 4 star commitment means the tenant is at least 20% more efficient than the general commercial tenant market.<sup>4</sup>

### WT Sustainability

WT Sustainability's Sydney office achieved a NABERS tenancy rating of 6 Stars and is using 78% less energy than a similar-sized office. The 'National Australian Built Environment Rating System' (NABERS) and Greenstar (Green Building Council Australia) tools were used to control and monitor their design and construction targets. NABERS measures a building's energy, water, waste and indoor environment efficiencies and assigns a rating, from 0-6 stars.

The National Australian Built Environment Rating System (NABERS) tools were used during the design stage of the fit out to control and monitor energy efficient targets, initially focusing on the large energy users within tenancies – supplementary air-conditioning, lighting and office equipment.<sup>5</sup>



<sup>4</sup> Information sourced from CitySwitch: [EnergyCut.info/city-switch-nabers](http://EnergyCut.info/city-switch-nabers)

<sup>5</sup> [EnergyCut.info/office-pro-case-study](http://EnergyCut.info/office-pro-case-study)

## Is your local council linked to the 'CitySwitch' program?



'CitySwitch' is a high-value, no-cost advisory service which helps commercial office tenants to improve office energy efficiency and save money.

The ultimate aim is to help businesses to reduce energy operating costs by achieving a 4-star or higher NABERS energy rating. They have also been at the forefront in the push for 'green leases'.

The program aims to:

- educate businesses through the provision of toolkits, workbooks, case studies and site tours
- show companies how to speed up the uptake of energy efficiency practices and investments
- celebrate and reward leadership and achievement in energy efficiency through its annual awards and ongoing member promotions.

This structured approach to planning and implementing energy efficiency projects, saves participants time and money.

A number of councils are now involved in the 'CitySwitch' program including the City of Sydney, North Sydney Council, Willoughby City Council, City of Melbourne, Adelaide City Council, and the City of Perth.

Currently, 721 tenancies covering over 2,879,273 sqm in these various municipalities, have committed to the CitySwitch program. For more information about their work, visit [CitySwitch.net.au](http://CitySwitch.net.au)

For specific information about best practice leasing, visit the CitySwitch pages at [EnergyCut.info/city-switch-leases](http://EnergyCut.info/city-switch-leases)





## Tyres 4 U, VIC

Tyres 4 U is the major co-tenant of a purpose-built, energy efficient facility, Keysborough Spec 1. The project was developed by the facility's owner, Australand.

“By future-proofing the facility, we can help tenants offset the costs of rising energy prices,” said Paolo Bevilacqua, Australand's Sustainability Manager.

Compared to their previous premises, the businesses who moved into this energy efficient facility are experiencing far lower energy bills.

“Our work in this area offers a real point of difference. This type of development is an investment that allows us to test new ideas that will improve energy efficiency,” said Paolo.<sup>6</sup>



<sup>6</sup> [EnergyCut.info/keysborough-spec-1](https://EnergyCut.info/keysborough-spec-1)





## STEP 18

# Financing your upgrades

**Investing in energy efficiency retrofits, upgrades and infrastructure is a great way to reduce your energy bills.**

If you want to maximise your energy efficiency, but can't afford the upfront capital cost of new equipment, this section will show you the finance options available to small to medium businesses. These options include:

- Loans and leases
- On-bill financing
- Grants and rebates
- Energy efficiency certificate schemes

This step also looks at the advantages and disadvantages of the different finance options.<sup>1</sup>

**In the past, it was not always easy for small businesses to get finance for energy efficiency upgrades. However, energy efficiency finance is a fast changing game and more options are now available. For an up to date list of companies who provide this finance to small businesses, visit [EnergyCut.info/SME-finance](https://EnergyCut.info/SME-finance)**

**Whatever finance option you choose, make sure you get a payment structure that suits your business and its cash flow.**

<sup>1</sup> Disclaimer: The information provided on the tax and accounting implications of each finance option in this step has been taken from the NSW Office of Environment & Heritage 'Energy Efficiency and Renewables Finance Guide'. The information in their guide was based on general advice provided by NSW OEH consultants. It does not reflect the specific circumstances of any business using this guide and should not be relied on by businesses seeking any of these finance options. Instead, you need to seek your own tax and accounting advice.

# In this step

- ▶ **Specialist providers of energy efficiency finance for small business**
- ▶ **What payback should you look for?**
- ▶ **Evaluating the financial case to upgrade**
- ▶ **Advantages and disadvantages of different finance options**
- ▶ **Loans and leases**
- ▶ **On-bill financing**
- ▶ **Energy efficiency certificate schemes**
- ▶ **Government grants**
- ▶ **Environmental Upgrade Agreements**



## Specialist providers of energy efficiency finance for small business

If you want to widen your finance options, there are specialist companies who finance energy efficiency upgrades for small businesses. They may also finance renewable energy systems.

These companies can finance upgrades for heating and cooling systems, energy efficient lighting, plant & equipment, insulation, hot water systems, sensors and timers, solar PV, building management systems, wind turbines and power factor correction units.

For an up to date list of these companies, visit [EnergyCut.info/SME-finance](https://EnergyCut.info/SME-finance)

## What payback should you look for?

When it comes to return on investment, efficiency expert Andrew Randall says energy efficiency projects have paybacks that are hard to match:

“Converting halogen lighting to LED lighting will most often have a less than two year payback, making investment a very simple decision. Other energy efficiency projects such as solar energy may have more conventional five to seven year payback periods.

However in investment terms, with solar we are talking about a 16% annual return. Given today’s cash investment rates of less than 3%, in my opinion these energy efficient investments are far superior to leaving money in the bank.”

## Can your repayments be less than your financial savings?

With energy efficiency upgrades, you should always identify the opportunities that give you the quickest possible return.

With a lighting upgrade, for example, can you obtain finance where the savings arising from the new lighting set-up pay for the repayments?

Due to the quick payback period, however, some companies now fund lighting upgrades via their operating budget.

**As a rule, many lenders will not offer finance where the term is longer than the warranty offered by the product. If you are buying lighting that has a three year warranty, you will probably be offered a maximum three year finance package.**

## Evaluating the financial case to upgrade

The NSW Office of Environment and Heritage (OEH) has developed a range of case studies that look at the financial outcomes from different types of energy efficiency upgrades. Within each case study, they also look at the available financial options.

### Heating and Cooling

Find out how a business saved \$73,000 over 15 years by using an Environmental Upgrade Agreement to finance an energy efficient heating, ventilation and air-conditioning system (HVAC).

Visit: [EnergyCut.info/oeh-hvac](https://EnergyCut.info/oeh-hvac)

### Lighting

Find out how a business determined they would be better off by about \$11,500 over eight years by using on-bill financing to finance a lighting upgrade. This case study compares a lighting upgrade from T8 lighting to the more efficient T5 alternative - the savings in this case study would have been higher if they had switched to LED tube lighting.



[EnergyCut.info/oeh-lighting](https://EnergyCut.info/oeh-lighting)

### Refrigeration

Find out how a mushroom supplier determined that they would be better off by about \$340,000 over 15 years if they invested in an energy efficient system.

[EnergyCut.info/oeh-refrigeration](https://EnergyCut.info/oeh-refrigeration)

### Chillers

Find out how a business determined that they would be better off by about \$610,000 over 25 years if they invested in an energy efficient system using an Energy Services Agreement to finance a chiller upgrade system.

[EnergyCut.info/oeh-chillers](https://EnergyCut.info/oeh-chillers)



## Voltage optimisation

Find out how a business using a capital lease to finance voltage optimisation saved a significant amount of money. The initial cost to install was \$40,000 but within one year the system had paid for itself thanks to a first year electricity cost reduction of \$40,000.

[EnergyCut.info/oeh-voltage](https://www.energycut.info/oeh-voltage)

## Motors

Find out how a textile manufacturer using an operating lease to finance motors determined that they would be better off by about \$663,000 over 15 years if they invested in an energy efficient system.

[EnergyCut.info/oeh-motors](https://www.energycut.info/oeh-motors)

## Variable-speed motors

Find out how a business using a commercial loan to finance motors with variable speed drives determined that it would be better off by about \$317,000 over 15 years if it invested in the energy efficient system.

[EnergyCut.info/oeh-vari-motors](https://www.energycut.info/oeh-vari-motors)

## Compressed air

Find out how a processing plant using an Environmental Upgrade Agreement (EUA) to finance an energy efficient compressed air system determined that they would be better off by about \$90,000 over 15 years if they invested in an energy efficient system.

[EnergyCut.info/oeh-air](https://www.energycut.info/oeh-air)

## Building management

Find out how a property company using on-bill financing to finance a new building management system determined that it would be better off by about \$64,000 over 15 years.

[EnergyCut.info/oeh-building](https://www.energycut.info/oeh-building)

## Solar photovoltaic (PV) system

Find out how a shopping centre owner determined that it would be financially better off if it invested in a solar photovoltaic (PV) system since the expected reduction in the cost of electricity purchased from the grid over the life of the system exceeds the cost to purchase and install it.

[EnergyCut.info/oeh-solar](https://www.energycut.info/oeh-solar)

## Wind turbine system

Find out how a meat processing plant determined it would be financially better off if it invested in a wind turbine, since the expected savings from the reduction in the cost of electricity purchased from the grid over the life of the system exceeds the cost to purchase and install it.

[EnergyCut.info/oeh-wind](https://www.energycut.info/oeh-wind)

## Biogas generation and combustion

Find out how a piggery used an energy services agreement to finance a biogas system and reduced energy costs by \$99,663 in the first year.

[EnergyCut.info/oeh-biogas](https://www.energycut.info/oeh-biogas)

### Do you need solar finance for your business?

The NSW Office of Environment and Heritage has published a definitive guide to financing solar power upgrades for your business. In addition to listing a range of financing options, it lists the things you need to look out for when installing solar power at your business.

To make quote comparisons easier to compare, the site also has a template document that you can send to solar retailers and financiers.

For more information visit: [www.environment.nsw.gov.au/business/solar-finance-guide.htm](http://www.environment.nsw.gov.au/business/solar-finance-guide.htm)

The solar quote comparison template can also be downloaded from [EnergyCut.info/solar-quote-template](https://www.energycut.info/solar-quote-template)





## Advantages and disadvantages of different finance options

When it comes to funding your energy efficiency upgrade, you need to assess the pros and cons of the different options available to you.

### Up-front commitment of capital

Some businesses may seek options where the need for up-front investment in the form of internal financing is reduced.

### Ownership of the asset and balance sheet impact

There are benefits to avoiding having new debt on the balance sheet as this can affect existing loan covenants and the ability to get further finance.

However, some businesses may prefer to own assets, even if this impacts their balance sheets.

### Surety/collateral

Some finance options require that a business or its owners provide security or supporting collateral, which can be a barrier.

### Repayment terms

Businesses should be wary of repayment obligations which they might be unable to meet, especially when repayments can vary.

### Tax treatment

Depreciation, interest payments and repayments that are treated as operating costs are tax deductible.

### Risk transfer

The risk of the energy efficiency or renewables project not performing as expected or losing value to the financier can be transferred under some finance options.

Source: NSW OEH 'Energy Efficiency and Renewables Finance Guide'. [Download it from EnergyCut.info/oeh-finance](https://www.energycut.info/oeh-finance)

## Loans and leases

If your business doesn't have the capital to implement an energy efficiency upgrade, traditional finance options like a loan or lease can help you get started. Better still, the post-upgrade savings from your energy bills can help service the cost of the loan or lease.



As this book shows, the efficiency of equipment is always improving. This is where leasing has its advantages. It enables you to upgrade your equipment as more efficient alternatives become available. The other advantages and disadvantages of leasing are covered below.

### Advantages and disadvantages of lease agreements

Option	Description	Advantages	Disadvantages
<b>OPERATING LEASE</b>	<p>The equipment is owned by the financier and the customer obtains the sole right to use it.</p> <p>The customer pays regular lease payments to financier and pays all maintenance costs.</p> <p>At the end of the lease, the customer has the option of returning the equipment, making an offer to buy it, or continuing to lease it.</p>	<p>No or reduced up-front cost.</p> <p>Limited collateral required (other than the asset).</p> <p>Leasing costs are tax deductible.</p> <p>Fixed lease payments.</p> <p>Lease obligation is off balance sheet.</p> <p>Financier bears 'residual value risk' (i.e. risk that the equipment has no value at the end of the lease).</p> <p>Particularly suitable where equipment has perceived high obsolescence or is required for a short period.</p>	<p>Customer bears the risk of the equipment becoming unusable during the lease.</p> <p>Customer cannot depreciate the asset.</p> <p>More suitable for capital intensive projects and where costs are mainly for physical assets.</p> <p>Less suitable for less expensive equipment, such as lighting, or when a large portion of costs are for installation and associated services.</p> <p>Less suitable when equipment is difficult to remove or reuse.</p>

[continued >>](#)



Option	Description	Advantages	Disadvantages
<b>CAPITAL LEASE</b>	Same as operating lease, except that at the end of the lease, equipment ownership transfers to the customer on payment of an agreed amount.	<p>No or reduced up-front cost.</p> <p>Fixed lease payments.</p> <p>Customer depreciates the equipment.</p> <p>Interest component of repayments are tax deductible.</p>	<p>The lease obligation appears on the balance sheet.</p> <p>Customer bears the economic risk of the equipment becoming unusable, including the 'residual risk'.</p> <p>As for operating lease, more suitable for capital intensive projects and where costs are predominantly for physical assets.</p>

Table source: NSW OEH 'Energy Efficiency and Renewables Finance Guide'. Download it from [EnergyCut.info/oeh-finance](http://EnergyCut.info/oeh-finance)

*'If it appreciates in value, buy it.  
If it depreciates in value, lease it.'*

*- J. Paul Getty*

## Advantages and disadvantages of bank loans

If your business does not wish to utilise leasing, the pros and cons of self-funding and bank loans are covered below.

Option	Description	Advantages	Disadvantages
<b>SELF FUNDED</b>	Energy efficiency or renewables project is financed with own funds from capital budget.	No external obligations to financiers.  Business owns and can depreciate the equipment.	Must meet the company's minimum acceptable rate of return on capital (also referred to as the project hurdle rate).  Less capital available for investment in core business activities.  Business carries all finance and performance risks.
<b>COMMERCIAL LOAN</b>	A lender provides capital to a borrower, to be repaid by a certain date, typically at a predetermined interest rate that moves in line with changes in a reference lending rate.  Customer makes regular repayments to lender to cover interest costs. Capital repayments can be bundled with interest payments, or can occur at the end of the loan.	No or reduced up-front cost.  Interest and depreciation of energy efficient equipment are tax deductible.	Customer bears the economic and technical risk if the equipment becomes unusable.  Customer could be required to provide security, such as a lien on property or other assets, or guarantees from parent companies, another financier or owners.  Loan is on the balance sheet.

[continued >>](#)



Option	Description	Advantages	Disadvantages
<b>ENERGY EFFICIENT LOAN</b>	A loan available only for energy efficiency and renewables projects.	<p>No or reduced up-front cost.</p> <p>Interest and depreciation of new equipment is tax deductible.</p> <p>In addition, these loans are specifically designed for energy efficiency and renewable energy projects, so generally have lower interest rates and longer finance periods.</p>	<p>Customer bears the economic and technical risk if the equipment becomes unusable.</p> <p>Customer could be required to provide security, such as a lien on property or other assets, or guarantees from parent companies, another financier or owners.</p> <p>Loan is on the balance sheet.</p> <p>Few financiers offer this type of loan product.</p>

*Table source: NSW OEH 'Energy Efficiency and Renewables Finance Guide'. Download it from [EnergyCut.info/oeh-finance](http://EnergyCut.info/oeh-finance)*

## On-bill financing

Choosing on-bill financing means the energy retailer installs equipment. This is repaid through a ‘repayment’ charge on energy bills. Once all payments are made, title for the equipment transfers to the customer.

At the moment only AGL and Origin Energy offer this form of financing, and it’s currently only available to medium to larger businesses. Over time energy retailers may offer on-bill financing to small businesses, but in the meantime, the following table is for medium to larger customers only.

### Advantages and disadvantages of on bill financing

Option	Description	Advantages	Disadvantages
<p><b>Utility on-bill financing</b></p> <p>Currently only available to larger energy users via Origin and AGL - but other energy retailers may bring out their own version of this type of financing.</p>	<p>Energy retailer installs equipment. This is repaid through a ‘repayment’ charge on energy bills.</p> <p>Once all payments are made, title for the equipment transfers to the customer.</p>	<p>No or reduced up-front cost.</p> <p>Interest component of repayments are tax deductible.</p> <p>Payment via utility bill reduces risk of default, therefore lowering financing costs.</p> <p>Typically have guaranteed savings.</p> <p>Typically arranged through a provider who can identify and implement energy saving opportunities.</p>	<p>Generally ties customer to the energy retailer for the financing term, regardless of whether the retailer offers competitive energy rates.</p> <p>Risk of energy being cut if customer defaults on the debt repayment.</p> <p>If energy savings are not guaranteed, customer bears technical risks.</p> <p>Repayment liability is on the balance sheet.</p>

Table source: NSW OEH ‘Energy Efficiency and Renewables Finance Guide’. Download it from [EnergyCut.info/oeh-finance](http://EnergyCut.info/oeh-finance)



## Energy efficiency certificate schemes

The Victorian and NSW Governments both run energy efficiency schemes where they give financial incentives to companies who implement approved energy efficiency upgrades.

### The Victorian 'Energy Saver Incentive' (ESI)

The Victorian Government's Energy Saver Incentive offers companies discounts and special deals on selected energy-saving appliances and products. The more energy efficient they are, then the more you will save.

These products and appliances must be purchased from participating businesses. These are listed at the 'Switch On' web page: [EnergyCut.info/energy-saver-incentive](https://www.energycut.info/energy-saver-incentive)

The energy efficient alternatives covered by the scheme include:

Heating and cooling; lighting; water heating; weatherproofing and insulation; standby controllers; showerheads; televisions; refrigerators and freezers; clothes dryers; pool pumps; in-home displays; commercial lighting upgrades; refrigerated display cabinets; refrigerator fans; motors; water-efficient pre-rinse valves and low-flow trigger nozzles.

### The NSW 'Energy Savings Scheme' (ESS)

For small businesses, the best way to get involved in the NSW Energy Savings Scheme is to go through an organisation that is already accredited by the scheme.

To contact an Accredited Certificate Provider in NSW visit: [EnergyCut.info/accredited-cert](https://www.energycut.info/accredited-cert)

To find out what equipment, projects and activities that are eligible under the Energy Savings Scheme, visit: [EnergyCut.info/project-equip](https://www.energycut.info/project-equip)

To find out more about how the scheme works, visit: [EnergyCut.info/scheme-work](https://www.energycut.info/scheme-work)

## NSW Energy Saver Program

The Energy Saver program is a NSW Government initiative that provides support for NSW businesses who want to reduce their energy consumption and costs. It's best suited to organisations that spend more than \$60,000 a year on electricity.

Operated by a dedicated team within the Office of Environment and Heritage, the program provides practical guidance on energy efficiency. It helps business owners to target, prioritise and implement the best energy efficiency opportunities available.

Eligible businesses can receive subsidised, specialised advice and project support from approved energy efficiency specialists.

Whether it's identifying and prioritising an energy efficiency opportunity, implementing a project, or looking at accessing project financing, the Energy Saver team can help by providing:

- A 50% subsidised energy efficiency investigation from an approved Office of Environment and Heritage (OEH) energy auditor to identify energy efficiency opportunities.
- A detailed financial business case to support projects, tailored to your business.
- Free guidance on how to access the financial incentives in the NSW Energy Savings Scheme.

They also provide energy efficiency training courses and give technical support to help you implement identified energy saving opportunities.

## How much could your business save?

Specialists working with Energy Saver businesses have on average identified electricity and cost savings of 23%.

For more information, visit: [EnergyCut.info/nsw-gov-energy-saver](https://EnergyCut.info/nsw-gov-energy-saver)





## Government grants

There are many government grants and assistance programs available that are designed to help Australian businesses. Obtaining a grant can help to reduce the risk of using innovative technologies and they can reduce the payback period for an energy efficiency upgrade.

To help you find grants that may be available for your type of business, the Federal Government has created the 'Grant Finder' website. Type in 'energy efficiency' into the search engine to find the current grants that are available at federal, state and local government levels. You can also find the details of grant programs that help companies with education, innovation and business development, amongst others.

Check the site regularly to see if there are grants or assistance that your business might be able to apply for: [EnergyCut.info/grant-finder](https://www.energycut.info/grant-finder)

There is also a commercial grant finding website called 'Business Grant Guru'. You can check it out here: [EnergyCut.info/business-grant-guru](https://www.energycut.info/business-grant-guru)

### Find a grant writer:

If you've never written a grant before, the process can be a bit daunting. However, there are experienced people that you can hire to do it for you. [EnergyCut.info/grant-writer](https://www.energycut.info/grant-writer)

### The CitySwitch NABERS Energy Grant program

Upon joining the CitySwitch energy efficiency initiative, commercial office tenants in Sydney, Willoughby, Perth, Adelaide and Victoria can receive a grant to reduce the cost of their NABERS Energy rating assessment.

To find out more about the CitySwitch NABERS Energy Grant program, visit:

[EnergyCut.info/nabers-grant](https://www.energycut.info/nabers-grant)

# Environmental Upgrade Agreements

An Environmental Upgrade Agreement is a relatively new form of financing that makes it easier and cheaper for property owners to retrofit and improve the energy efficiency of old commercial and industrial buildings.



An Environmental Upgrade Agreement (EUA) involves three parties: the building owner, the finance provider and the council. Together they sign an EUA under which:

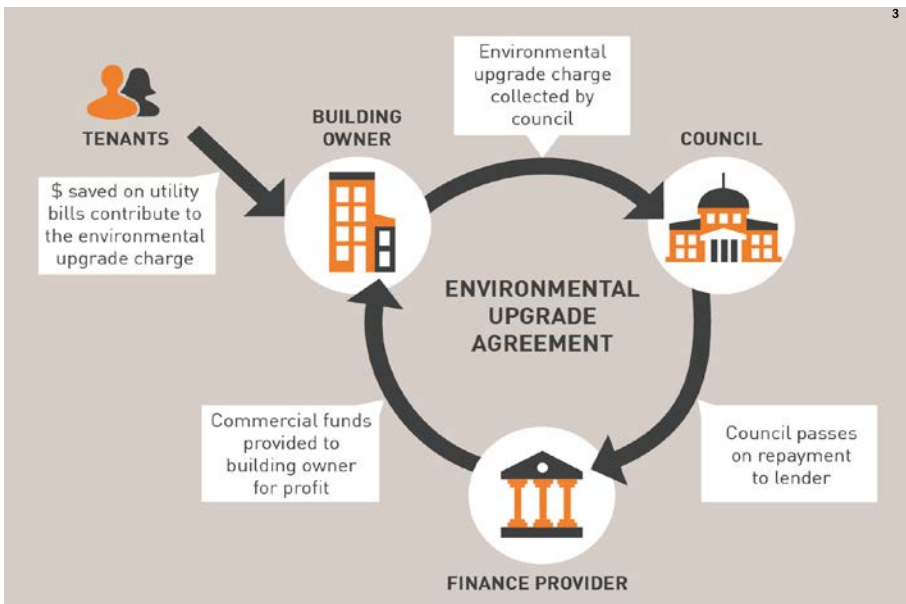
- The building owner borrows funds from the finance provider to fund an energy efficiency upgrade and/or environmental improvements. The EUA sets out the conditions of the loan (term, principal, interest, etc).
- The building owner makes the repayments of the loan to council (although the council is not obliged to make payments until it has received an equivalent amount from the building owner).
- The council provides an environmental upgrade charge notice to the building owner. This amount is the same as the repayments due to the finance provider. The council collects the payments from the building owner in the same way that it collects rates. The council then passes on the funds to the finance provider.
- If the building owner fails to make payments, the council must enforce the payment using its powers of enforcement, generally in the same way that it can enforce payment of council rates.
- The building owner may charge this cost back to their office tenants, but only where the charge is smaller than or equal to savings the tenant will make in energy reduction costs.
- If the property is sold, the purchaser of the property can elect for the environmental upgrade charge to continue to run with the land. Alternatively they can elect for the vendor (the outgoing building owner) to prepay the council and have the environmental upgrade charge released. In that event, the council would fully repay the finance provider.



The benefits are numerous:

- 100% project finance can be obtained with no upfront capital required.
- A building owner can obtain a loan with lower fixed interest rates than standard commercial loans.
- It improves the cash flow of the building owner as funding can be accessed with the need for large amounts of upfront equity.
- The finance has longer loan terms for repayment.
- Savings from the energy efficiency upgrades can be used to help repay the loan.

This form of energy efficiency financing has already been introduced by the City of Sydney, Melbourne City Council and other local government areas. It's anticipated that many other councils will introduce EUAs in their local area. So if you have a building that could benefit from an EUA, talk to your local council to see if they can enter into an EUA.<sup>2</sup>



<sup>2</sup> This information has been adapted from an article by Jeremy King from Corrs Chambers Westgarth that was dated 12 April 2013 - it is correct as at the time of printing: [EnergyCut.info/westgarth-article](http://EnergyCut.info/westgarth-article)

<sup>3</sup> Image courtesy of Corrs Chambers Westgarth.

## Advantages and disadvantages of environmental upgrade agreements

Option	Description	Advantages	Disadvantages
<p><b>Environmental Upgrade Agreements (EUA)</b></p> <p>At present only available for commercial and industrial buildings in limited council areas.</p> <p>There is significant momentum behind this form of financing. As this book goes to print, more councils are coming on board.</p>	<p>A loan for the environmental upgrade of a building which is repaid through a local council environmental upgrade charge.</p>	<p>No or reduced up-front cost.</p> <p>Loan tied to the property leads to lower risk for the financier, so better rates and extended terms are offered.</p> <p>Interest component of payments are tax deductible.</p> <p>Fixed repayments.</p> <p>Provides a mechanism for transparent pass-through of repayments to tenants.</p>	<p>At present only available for commercial and industrial buildings in limited council areas: City of Sydney, North Sydney, Parramatta, Newcastle, Lake Macquarie, and City of Melbourne.</p> <p>Consequently, deals below \$250,000 are not preferable for some financiers. However, this appears to be changing as the popularity of the scheme widens.</p> <p>The loan can be considered on the balance sheet, subject to the specific circumstances of a business.</p>

Table source: NSW OEH 'Energy Efficiency and Renewables Finance Guide'. Download it from [EnergyCut.info/oeh-finance](http://EnergyCut.info/oeh-finance)



## Further information on financing energy efficiency upgrades

The tables in this step are from the 'Energy Efficiency and Renewables Finance Guide' from the NSW OEH. It's an excellent guide for medium to large companies who wish to finance energy efficiency upgrades and improvements.



The author would like to thank the NSW OEH for giving us permission to reproduce the tables from this guide. It can be downloaded from [EnergyCut.info/oeh-finance](https://EnergyCut.info/oeh-finance)

Innovation





## STEP 19

# Look out for innovation

The rising cost of energy has led to a range of new products, services and ideas that save energy and reduce the running costs of businesses.

Keeping informed of the latest innovations in energy efficiency can sometimes lead to big reductions in your energy bills. This section shows you some of the fields where innovation is taking place and the developments some companies are putting into place to save on their energy bills.

Innovation can come via new technology, as well as through changes to systems and processes. Some of the most innovative ideas might come from your own staff or stakeholders, so make sure that you involve them in your efforts to reduce energy use.

### **Pursuit of innovation increases productivity**

**A report released in September 2013 by the Australian Bureau of Statistics found that businesses that sought out innovation were more than twice as likely to improve their productivity than those that did not.**

**“Productivity increased for a third of businesses that took steps to innovate during 2011–12,” said Andrew Puljic from the Australian Bureau of Statistics, “while only 14 percent of non innovation-active businesses reported any increase in productivity.”<sup>1</sup>**

<sup>1</sup> [EnergyCut.info/innovation-business](http://EnergyCut.info/innovation-business)



# In this step

- ▶ Innovation with lighting
- ▶ Innovation in equipment
- ▶ Innovation in energy control
- ▶ How to keep up with innovation in your field





## Innovation with lighting

A good example of innovation is LED lights. Five years ago, they were not considered 'ready for prime time'. Indeed, early LED lighting was known for a high failure rate.



Today, however, is a different story – the technology and reliability have improved dramatically. Many businesses are now installing well-known LED brands that can reduce lighting costs by up to 80%.

The developments in this space are getting better still. One major company has developed a light bulb prototype that they claim cuts energy use in half whilst doubling light output. Given that an estimated 19% of the world's energy consumption is due to lighting, this technology breakthrough could significantly cut lighting bills.<sup>2</sup>

Innovation is not just limited to lighting. There could well be groundbreaking energy efficiency developments in your industry that you're not yet aware of. Being on the lookout for such opportunities can sometimes make a real difference to your energy bills.

### Philips Electronics - innovation in high bay lighting

Previously, LED high bay lighting had a reputation for not being able to cope with high temperatures in rooftop areas. This is set to change thanks to an innovative new product from Philips whose thermal design gives it high temperature resistance.

Compared to the standard 400W conventional metal halide high bay lighting, their new 'GreenUp LED Highbay' can reduce energy use by 75% whilst still giving out the same level of light output.

Launched in March 2015, these new lights contain an occupancy sensor that turns off the lights when nobody is in the workspace below. It also has a daylight sensor that can vary the lighting levels depending on how much daylight is coming into the building.

What makes this lighting so innovative is that it can also be wirelessly programmed into zones. This helps to balance comfort and safety with energy saving. Other companies will no doubt release similar products in the future, so if your company uses high bay lighting, it's worth keeping an eye on this space.



<sup>2</sup> [EnergyCut.info/philips-innovation](http://EnergyCut.info/philips-innovation)

## Innovation in equipment

The energy efficiency of refrigerators and appliances has improved dramatically since the mid-1970s.

The La Porchetta restaurant chain offers a good example of the benefits of this kind of innovation.



La Porchetta is an Italian restaurant chain with 61 sites around Australia. Each restaurant spends between \$8,000 and \$15,000 per year on gas supplies. They identified a gas powered oven that reduces their gas usage by a third. Better still, it cooks the food faster.<sup>3</sup>

Using this oven will save money on their gas bills and get the food out quicker to hungry customers, giving their restaurants the potential to turnover more customers and increase income.

This is the kind of innovation that all companies should be on the lookout for.

When it comes to money saving innovation, what is the equivalent of this gas oven in your business?

### Gray's Bakery, VIC

Gray's Bakery was only the second bakery in the country to install the new highly efficient Tagliavini oven that only fires up when necessary and goes into slow mode to reduce energy when it's not required. This is crucial as the oven is on from 1.30am until 5.30pm every day.

The oven also features bays that only use energy when that part of the oven is required. This innovative new oven is saving the bakery thousands of dollars a year.<sup>4</sup>

Searching out and finding innovative solutions like this won't just save you money on energy. You may also find that it makes your business more productive and resilient.

<sup>3</sup> [EnergyCut.info/la-porchetta-innovation](https://www.energycut.info/la-porchetta-innovation)

<sup>4</sup> [EnergyCut.info/grays-bakery-case-study](https://www.energycut.info/grays-bakery-case-study)



## Innovation in energy control

In 2012, Lasseters Hotel Casino in Alice Springs installed Enkoa energy-control units in 66 new hotel rooms. These smart sensors cut the energy supply to rooms that are unoccupied. When windows or doors are opened, this system can also reduce the running



costs of the air-conditioning and lighting. This helped them to better manage the energy use in those rooms. The capital cost was \$19,645 but the payback is \$19,986 a year.<sup>5</sup>

Would your business be able to save money with energy-control units or other energy efficiency innovations?

### La Madre, VIC

“There were a lot of blank looks when we told them we wanted to install a heat shifter,” said co-owner Tez Kemp of talking to tradespeople about La Madre’s energy-conscious retrofit.

“So it was a matter of a quick Google search and some clever craftsmanship. Now, the heat from the ovens warms our office and shop.”<sup>6</sup>

<sup>5</sup> [EnergyCut.info/dosomething-research](http://EnergyCut.info/dosomething-research) & [EnergyCut.info/lasseters-hotel-casino](http://EnergyCut.info/lasseters-hotel-casino)

<sup>6</sup> [EnergyCut.info/la-madre](http://EnergyCut.info/la-madre)

## How to keep up with innovation in your field

At a local level, your industry association and business networks can be a good source of information.

To find out what else is happening, type the following terms into your favourite search engine: *'your sector name' energy efficiency case studies*; or *'your sector name' energy efficiency innovation*.

You should also talk to your industry contacts at trade events and awards nights. This is a good way to catch up on innovation in your sector.

Sales representatives also have their ear to the ground on what is happening around your industry. Ask them if they know of any companies who are finding innovative ways to reduce their energy use.

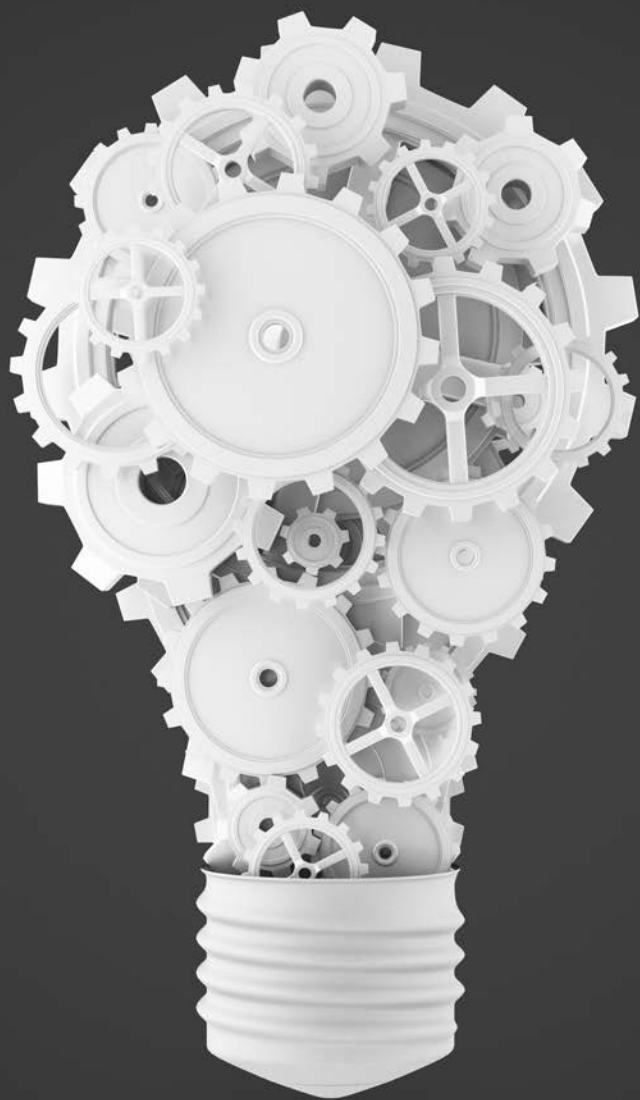


### Princes Laundry, VIC

By using advanced technology that recovers waste heat from the exhausts of gas-fired dryers, Princes Laundry saved over 33% of their total gas use. Using this innovative technology, they are predicted to achieve a 100% return on investment in just over five years.

When it comes to the equipment being used in your business, it pays to seek out new technologies that could reduce your energy use.<sup>7</sup>

<sup>7</sup> [EnergyCut.info/princes-laundry-vic](http://EnergyCut.info/princes-laundry-vic)





[www.energycut.com.au](http://www.energycut.com.au)





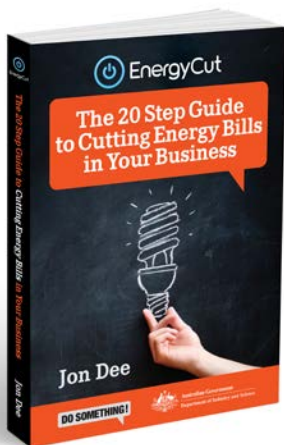
## STEP 20

### Further information

The field of energy efficiency is a constantly changing one, with innovations and new organisations appearing all the time. Government programs also change intermittently.

That's why we have put our 'further information' listing online.

Visit [EnergyCut.info/step-20](http://EnergyCut.info/step-20) for a list of organisations, government bodies and experts that can provide information to help your business reduce its energy use.



### Download the EnergyCut book for free!

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If you need to find information quickly, you can search for it in this interactive PDF. In addition to reading it on your tablet or computer, you can also distribute the book for free to all of your employees, suppliers and stakeholders.



### **About the author**

As a social entrepreneur, Jon Dee has combined his philanthropic activities with his role as an advocate for the small business sector.

On SKY NEWS Business channel, Jon is the host of *Smart Money*, a TV program that shows small to medium sized businesses how to save money by being smarter with energy and other resources.

Released in 2010, Jon's *Sustainable Growth* book has become the definitive sustainability guidebook for small business. With 90,000 copies distributed, his book showed that being sustainable is good for the bottom line.

Jon's new book *Energy Cut* is a comprehensive and definitive energy efficiency guide for small to medium sized businesses. Written in plain English, *Energy Cut* describes 20 practical steps that businesses can take to cut their energy use and save money.

Within Australia and overseas, Jon regularly gives keynote speeches and consults to companies on efficiency, sustainability and change management.

He has also released *Agado*, an iPad app that helps organisations and small businesses to keep track of their key contacts, customers and projects.

As a philanthropist, he is the Founder and Managing Director of the Australian advocacy organisation DoSomething. In June 1991, he also founded Planet Ark in partnership with Pat Cash. He headed up the organisation for 15 years, turning it into a household name and a powerful force for change.

In 1988, he also founded Rock Aid Armenia which led to the building of a music school for 220 children in the Armenian earthquake zone. Together with Olivia Newton-John he also founded Australia's National Tree Day and the international One Tree Per Child initiative.

Jon was Australian of the Year 2010 (NSW) and in 2009 was the recipient of Armenia's highest award, The Order of Honor, for his long-term work in Armenia. He lives in the Blue Mountains with his wife Leanne and their two daughters.

### **For more information**

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