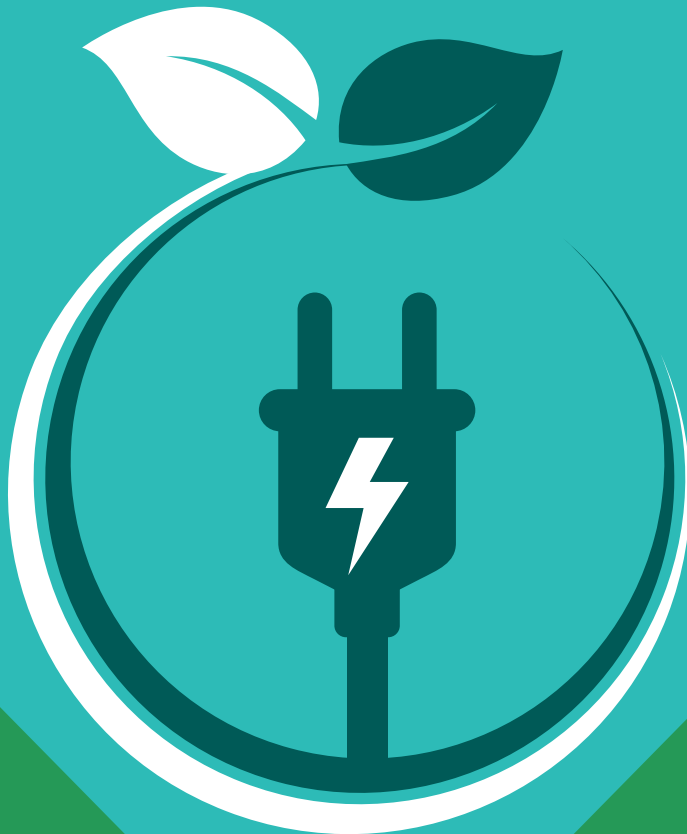




GLEN EIRA
CITY COUNCIL

HOME ENERGY KIT MANUAL



You can download a copy of this Home Energy Kit Manual at
www.gleneira.vic.gov.au/energykit

For other guidance and resources to help you save energy and
electrify your home, visit www.gleneira.vic.gov.au/electrify

If you'd like to share your experience of this
Home Energy Kit, we'd love to hear from you!



sustainability@gleneira.vic.gov.au

A special thanks to Stonnington City Council for
enabling content from their manual to be adapted to
prepare this Home Energy Kit Manual.

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Introduction

The Home Energy Kit enables you to:

- » understand where in your home you are using power and water;
- » measure your usage; and
- » identify actions you can take to improve your home's efficiency.

Using the equipment and taking the tests included in the Kit will provide an opportunity for you to reduce your environmental footprint as well as your energy bills.

How to use the Home Energy Kit

- STEP 1** Follow the instructions for each audit test, using the equipment as instructed.
- STEP 2** Record your results and use the action plan to identify where you can make improvements and what your next steps are.

Safety information



Care should be taken when using hot water or when near water pipes/hot water service.



Information provided in this manual is a guide only. If in doubt, seek professional advice.



Installation and repair of electric and gas appliances should be completed by a licensed professional.



Thermal imaging camera contains a laser. DO NOT point the laser toward anyone's eye or allow the beam to strike the eye from a reflective surface. DO NOT use the laser near explosive gases or in potentially explosive areas.



Energy saving measures should never compromise the health and safety of household members.

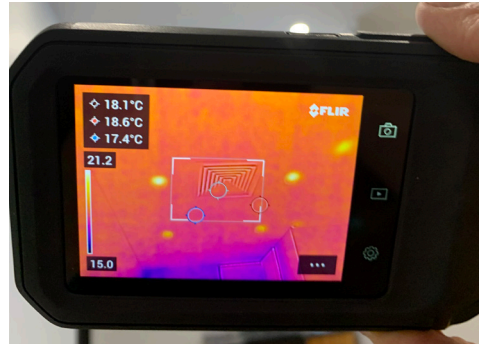
Kit contents

Each Home Energy Kit contains the following items:



Manual

Provides simple steps to complete each activity safely.



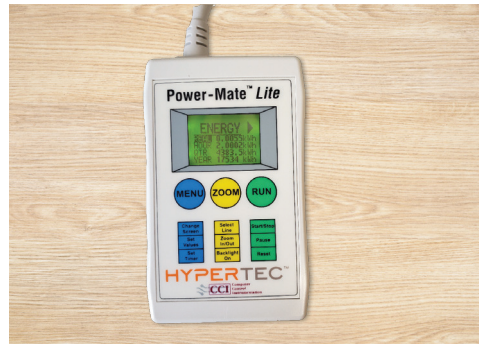
Thermal imaging camera

For locating draughts around your home, gaps in insulation, checking fridge seals, and measuring hot water temperature.



Thermometer

For measuring the temperature of rooms, fridges, and freezers.



Power-Mate

For measuring energy consumption and running costs of appliances.

Quick energy and water saving tips

Follow the simple steps below to reduce energy and water use in your home.

Heating and cooling



Using a reverse cycle air conditioner is typically one third of the cost of running gas ducted heating. If possible, only turn it on in rooms that are being used. Keep room temperature between 18°C–20°C in winter and 24°C and 26°C in summer. Changing the thermostat by 1°C (down in winter, up in summer) can save up to 10 per cent on heating and cooling bills.

Hot water



The most energy efficient way to heat water at home is with a heat pump hot water system. These result in 60–75 per cent less energy consumption than a traditional electric resistive hot water system. Combined with a solar system they can lower your water heating costs substantially. To prevent bacterial growth, the recommended water storage temperature for a hot water system is 60°C. Water delivered to taps is typically around 50°C. Use a thermometer to test your water temperature and then adjust the settings on your hot water system. Where possible, use cold water.

Fridges and freezers



Check the temperature of your fridge and freezer. For fridges, aim for 3°C (but no higher than 5°C) and for freezers between -15°C and -18°C.

Switch off appliances



Appliances not in use can still use power. You can reduce this by switching appliances off at the wall. Older, inefficient appliances could also be increasing your power bill. Start investigating more efficient options so that when the time to upgrade comes, you are already prepared.

Showerheads and taps



Replacing shower heads and taps to WELS star rated models can drastically reduce water use. You can also buy a shower timer and limit your time in the shower to 3–5 minutes.

Seal draughts



Draughts can have a significant impact on the energy efficiency of your home, accounting for up to 25 per cent of heat loss in winter. Filling gaps around windows and pipes and installing draught stoppers on doorways and exhaust fans can dramatically improve the thermal comfort of your home while reducing your heating and cooling bills.

Lighting



Open curtains and blinds during the day instead of turning on the lights, and replace incandescent lighting with updated LED fixtures that are more energy efficient. Keep curtains and blinds closed during peak summer heat to prevent the sun from heating up your space.

Install insulation



Insulation is important for keeping your home comfortable. Adding insulation above your ceiling, in your walls, or under your floorboards can help improve the energy efficiency of your home. Ceiling insulation alone can help you save up to 20 per cent on heating and cooling energy costs. You can also install insulation, known as lagging, around hot water pipes which can help with hot water efficiency.

Glazing upgrades



Although windows are important for letting in natural light, they are effectively holes in your walls! Upgrading to double glazed windows, installing Low-E film and using close-fitting curtains and pelmets can help prevent heat loss in winter and heat gain in summer.

Improve shading



Shading windows on the northern and western sides of your home during summer is a simple and effective way of reducing heat gain into your home. Simple measures include awnings, shade cloth, a covered pergola, or planting deciduous trees.

Energy audit

According to Snapshot Climate (snapshotclimate.com.au) gas and electricity usage by Glen Eira households accounts for more than half of the city's carbon emissions.

These emissions mostly come from:

- » room heating;
- » hot water systems; and
- » other appliances.

There are many ways to significantly reduce these energy uses in your home.

Do the following activities to ensure you have energy efficiency.



Hot water

There are two main types of water heaters:

1. Storage Systems — Water is stored in an insulated tank for use as required. For health reasons, Australian Standards require storage tank systems to be set to no less than 60°C.
2. Continuous Flow/Instantaneous Systems — Water is heated as required. Temperatures can be set closer to end use requirements, usually 50°C.

The most energy efficient way to heat water in your home is with a heat pump hot water system. They use 60–75 per cent less energy than older-style electric resistance hot water systems.

Hot water temperature test

What you will need:



THERMOMETER



STOPWATCH /
SMART PHONE



CUP



PEN AND
PAPER

Process

1. Turn on the hot tap nearest to the hot water system and let it reach full temperature.
2. Carefully fill a cup with hot water.
3. Sit the thermometer in the cup and set the timer for one minute.
4. After one minute, read the thermometer and record the temperature.



Action plan

If the temperature is over 60°C and you have a storage hot water service, you can adjust the temperature down on the external unit.

For instantaneous systems, it is recommended to adjust the temperature to 50°C.

ADDITIONAL ACTIVITY: Check hot water system temperature

1. Use the thermal imaging camera to measure the temperature around different parts of your hot water system.
2. If there are uninsulated areas, investigate commercial products and relief valves that could be installed to improve the system's efficiency.

Draught detection

Draught-proofing stops warm air from escaping your home in winter and hot air from entering in summer, making your home much more comfortable.

Up to 25 per cent of winter heat loss from dwellings is caused by air leakage, also known as draughts. As many as nine out of 10 homes in Victoria have unwanted draughts.

Heating and cooling leak test

What you will need:



THERMAL
IMAGING CAMERA



PEN AND
PAPER

Process

1. Select an area in your room to take a reference point reading eg. an internal painted wall.
2. With this colour/temperature for comparison, use the camera to look for temperature variations paying particular attention to areas where there may be gaps:
 - » around doorways and windows
 - » where pipes connect to external walls
 - » vents or air outlets
 - » fireplaces or flues
 - » around stairways
 - » between floorboards
 - » around exposed beams
 - » around built-in heating or cooling units
 - » along architraves and skirting boards
3. Note down your main leakage locations.



SAFETY TIP

The thermal imaging camera contains a laser. **DO NOT** point the laser toward anyone's eye or allow the beam to strike the eye from a reflective surface. **DO NOT** use the laser near explosive gases or in potentially explosive areas.

Detailed instructions about the thermal imaging camera can be found on page 26 of this manual.





Action plan

Once you know the main source of your heating and cooling leaks you can take action, including:

- › seal gaps and cracks around windows, skirting boards, walls, and floorboards using readily available sealants or fillers, such as silicon or expanding foam, depending on the size of the gap or hole.
- › install sealant tape and draught excluders around doorways — check your local hardware stores for supplies.
- › when not in use you can block chimney draughts using chimney dampers, balloons, and screens.
- › install a backdraft damper or cover for exhaust fans or upgrade to a self-closing exhaust fan.



Please delete all photos from thermal imaging camera before it is returned to the library.



SAFETY TIP: HOUSES WITH GAS APPLIANCES

All flueless gas appliances (those which do not need to be connected to a flue pipe or chimney) require a certain amount of fixed ventilation to operate safely and expel the products of combustion from the home. Open flued gas heaters, which draw combustion air from the room in which they are located, require a supply of fresh air to operate safely.

If you undertake draught sealing in your home and you have one of these heaters, you should get a licensed gas fitter to check the safe operation of the appliances before they are used. Other indoor gas appliances, such as internal open flued gas water heaters or ducted heaters, should also be regularly checked by a licensed gas fitter.



Insulation

Depending on the age and condition of your home, you may have extensive, partial, or no insulation at all. If there is insulation there may be gaps from incorrect installation or tradespeople moving it while working.

Gaps in insulation have a huge overall impact on the effectiveness of the insulation installed. A small five per cent gap in your ceiling's insulation can reduce its effectiveness by 50 per cent — and many houses have small insulation gaps!

Insulation gap test

What you will need:



THERMAL
IMAGING CAMERA



SMARTPHONE
CAMERA



SAFETY TIP

It's tempting to save on installation costs by doing it yourself, but there can be electrical dangers. Safety first, get a professional in.

Process

1. This test should ideally be undertaken when the outside temperature is around 10°C higher or lower than the inside temperature (for example, early morning or a hot afternoon when an air conditioner is running).
2. Select an internal wall area in your home to take a reference reading.
3. With this colour/temperature for comparison, use the camera to look for temperature variations, paying particular attention to:
 - » corners of ceiling
 - » areas around downlights, cooling or heating vents in ceiling
 - » walls that are external facing
4. Gaps can be identified by a colour discrepancy where the insulation is missing. Make a note or take a photo of your gap locations.



Action plan

Once you understand where insulation is missing, engage a qualified contractor to fill the insulation gaps.

Resources

www.sustainability.vic.gov.au/insulation

Refrigeration temperature tests

What you will need:



THERMOMETER



STOPWATCH /
SMART PHONE



PEN AND
PAPER



THERMAL
IMAGING CAMERA

Process

1. Place the thermometer in the chosen location:
 - » fridge — shut the thermometer in the fridge
 - » freezer — shut the thermometer in the freezer
2. Set the stopwatch for five minutes, leaving the thermometer in its chosen location.
3. After five minutes, read the temperature shown on the thermometer.
4. Write down the temperature reading. Compare it with the recommended temperatures shown on the thermometer and adjust the fridge or freezer temperature control knobs if needed.
5. Repeat the test for each location.

ADDITIONAL ACTIVITY: Fridge/freezer door seal test

1. Focus the thermal imaging camera on the seals of your (closed) fridge/freezer doors.
2. Check if there is a large temperature difference between the seals and the door. This will be displayed as a colour variation.



SAFETY TIP

Make sure your fridge is not set higher than 5°C, as this can promote the growth of dangerous bacteria.



Action plan

The recommended temperature for fridges is between 3°C and 5°C. If a fridge is set to be a cooler temperature you could be increasing your electricity bills unnecessarily and causing frost build-up, or damaging food quality.

The temperature recommended for freezers is between -15°C and -18°C. Regularly remove frost build-up from your freezer as required and check the seals are not broken or damaged.

If there is a large temperature difference between the door and the seals of your fridge/freezer, it may be leaking cold air through the seal. Try cleaning the seals or replace them if necessary. Well-maintained seals will save you money.



TIP

Locate fridges and freezers in cool spots away from direct sun or heat sources, such as ovens. This will reduce the amount of work/energy they need to remain at their set temperature. If you have more than one fridge or freezer operating, consider using it only when needed, such as for large events.



Appliance energy use

Appliances and household equipment, like refrigerators and ovens, collectively account for approximately 33 per cent of a household's energy usage.

Measuring electricity usage of appliances

What you will need:



APPLIANCES



POWER-MATE



PEN AND

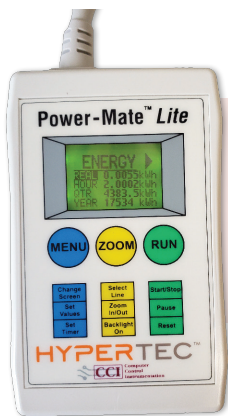


ELECTRICITY

ENERGY SAVING TIP:
Even when 'switched off', many appliances continue to use energy in standby mode, which can contribute 3–5 per cent of a household's energy use. Other than critical medical equipment, it's important to switch appliances off at the wall when not in use or use timers as appropriate.

Process

1. Check your electricity bill and take note of the 'Rate \$/kWh (or c/kWh)'.
2. Plug the Power-Mate into a wall socket then plug in the selected appliance.
3. Clear the old data by holding the RUN button until you reach the 'Confirm cl data' screen. Then press RUN again for 'Yes', to clear past data. You will need to do this for each appliance tested.
4. Press RUN button again to start the reading.
5. Use the MENU button to scroll across to see the costs (real, hour, per quarter and yearly), greenhouse gas emissions, energy usage and meter readings for your appliance.
6. The 'Energy' measurement in watts is the most relevant, showing you the rate at which electricity is being used at a given moment. The higher the watts, the more electricity the appliance is using at that time.
7. The 'Cost' measurement is the easiest to understand. Your computer might only cost you \$50 per year to run but your small electric heater could be significantly more expensive.



SAFETY TIP

This power meter is rated to 10A appliances. It is only suitable for indoor use and is not suited for equipment such as welders and heavy industrial equipment which are typically 15A.

Detailed instructions on the Power-Mate tool can be found on page 31 of this Manual.



Action plan

- » Appliances that are in stand-by mode, such as computers and sounds systems, are still using electricity. Make a commitment to switch them off when not in use.
- » Compare your appliances' current usage with those that might be newer and more efficient. Do some research and make a plan for when you next upgrade your appliances.

ADDITIONAL ACTIVITY: Further tests

Some equipment, such as electric hot water service, air-conditioning and lights, cannot be measured using the plug-in power meter included in this kit. To test them you will need additional equipment such as an energy monitor. These are currently available through a Victorian Government Energy Upgrades initiative.

Process

1. Connect a wireless energy monitor to your energy meter and install the related app on your mobile device.
2. Switch relevant electrical items off individually. Wait to see the change in the 'kW' usage on your app reading. Note down the figure and calculate usage using the app.
3. Use the app to check overnight energy usage and identify what electrical items can be switched off.





Energy saving tips

Heating and cooling

Reverse cycle air conditioners are typically a third of the cost to run compared to gas heating. In winter, keep room temperature between 18°C and 20°C, and in summer between 24°C and 26°C. Changing the thermostat by 1°C (down in winter and up in summer) can save up to 10 per cent on heating and cooling bills.

Switch off appliances

Appliances not in use can still use power. You can reduce this by switching appliances off at the wall. Older, inefficient appliances could also be increasing your power bill. Start investigating more efficient options so that when the time to upgrade comes, you are already prepared.

Fridges and freezers

Check the temperature of your fridge and freezer. Check the temperature of your fridge and freezer. For fridges, aim for 3°C (but no higher than 5°C) and for freezers between -15°C and -18°C.

Lighting

Open curtains and blinds during the day instead of turning on the lights, and replace incandescent lighting with updated LED fixtures that are more energy efficient.

Keep curtains and blinds closed during peak summer heat to prevent the sun from heating up your space.



Install insulation

Insulation is important for keeping your home comfortable. Adding insulation above your ceiling, in your walls, or under your floorboards can help improve the energy efficiency of your home. Ceiling insulation alone can help you save up to 20 per cent on heating and cooling energy costs. You can also install insulation, known as lagging, around hot water pipes which can help with hot water efficiency.

Glazing upgrades

Although windows are important for letting in natural light, they are effectively holes in your walls! Upgrading to double glazed windows, installing Low-E film and using close-fitting curtains and pelmets can help prevent heat loss in winter and heat gain in summer.

Seal draughts

Draughts can have a significant impact on the energy efficiency of your home, accounting for up to 25 per cent of heat loss in winter. Filling gaps around windows and pipes and installing draught stoppers on doorways and exhaust fans can dramatically improve the thermal comfort of your home while reducing your heating and cooling bills.

Improve shading

Shading windows on the northern and western sides of your home during summer is a simple and effective way of reducing heat gain into your home.



Water audit

Water is our most precious resource, essential to all life. There are numerous reasons to save water, including:

- » reducing the effects of drought and water shortages
- » saving energy and money
- » helping to keep water in our environment (rivers, wetlands, and water storage basins) and maintain wildlife habitat

Fixture efficiency

Inefficient shower heads have a flow rate above nine litres per minute. Shower heads that are over ten years old are likely to be more inefficient than newer ones.

A water-efficient shower head can use 40 per cent less water, saving water, energy, and money.

New, water efficient shower heads can deliver the same level of pressure and spray as older inefficient ones through improved aeration.

Shower head and tap flow rate test

What you will need:



STOPWATCH /
SMART PHONE



BUCKET



SHOWER
AND/OR TAP

Process for your shower

1. Turn your shower on to your normal temperature and full flow rate.
2. Put a bucket that can capture at least nine litres of liquid under the flow and time for 15 seconds.
3. Calculate how many litres were collected and multiply this by four to get the total use per minute.
4. Result: if your final calculation is over nine litres per minute, then your shower head is less than three-stars.

Process for your tap

1. Turn your tap on to your normal temperature and full flow rate.
2. Put a bucket that can capture at least nine litres of liquid under the flow and time for 15 seconds.
3. Calculate how many litres were collected and multiply this by four to get the total use per minute.
4. Result: if your final calculation is over ten litres per minute then your tap is less than three stars.



TIP — Reuse the water collected from this test! Water some pot plants, your garden, or fill up the kettle.



Action plan

For a family of four, replacing a shower head that flows at 15 litres per minute with:

- » a three-star showerhead (nine litres per minute) will save 70,000 litres and around \$210 each year on water bills
- » a four-star showerhead (six litres per minute) will save 105,000 litres and around \$315 each year on water bills

Toilet cistern leak test

What you will need:



STOPWATCH /
SMART PHONE



FOOD DYE



TOILET

Process

1. Place a few drops of food dye into your toilet cistern.
2. Check the bowl within 15 minutes to see if the colour appears (don't flush the toilet).
3. If the colour has appeared in the bowl there is a leak that should be repaired.



Action plan

If the food dye shows in the toilet bowl when the toilet has not been flushed there is a leak. Contact a plumber to repair or replace the cistern.



Property leak test

What you will need:



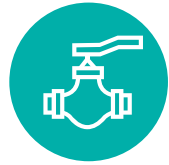
PEN AND
PAPER



STOPWATCH /
SMART PHONE



RECENT
WATER BILL



'STOP TAP' ON
YOUR WATER METER
SWITCHED ON

Process

1. All water using appliances/ equipment need to be off:
 - » don't flush the toilet ahead of this test
 - » your dishwasher/washing machine should be turned off
 - » any evaporative coolers should be turned off
 - » hoses, garden irrigation or sprinkler systems should be turned off
2. Check that the badge number on the water meter matches the number on your bill.
3. Write down your current meter reading (or take a photo on your phone), making sure to record the reading on each dial.
4. Start the stopwatch and time for two minutes.
5. Write down the meter reading at the two-minute mark (or take a second photo) and compare with the original number. You can also watch the dials on your meter to see if they are moving.



Action plan

Small difference: If the numbers are slightly different between the two readings and the dials have moved slightly, this can either be a small leak or the result of dripping taps or faulty appliances.

Next step: Check your appliances and taps to see if there are any obvious leaks, fix it yourself if you feel confident, or hire a professional.

Big difference: If the numbers are significantly different and the dials move rapidly, this could indicate a significant leak.

Next step: Hire a licensed plumber to investigate and repair significant leaks at your property.

No change: If the numbers are the same and the dials haven't moved, it's unlikely you have any leaks.



Water saving tips

Water saving tips for your house



Collect rainwater for use in the garden. This could be as simple as a rain barrel at the bottom of existing downpipes, or installing a rainwater tank.



Have a shower instead of a bath and limit shower time to 3–4 minutes (try using a timer or play a 4-minute song).

Baths can use over 100 litres of water, whereas a short shower can use less than 30 litres.



When purchasing new dishwashers or washing machines, choose appliances with high WELS rating. Wait until you have a full load of clothes or dishes before putting the machine on or adjust the settings according to the load.



Upgrade older, single-flush toilets to dual-flush toilets that are more water efficient. Or, for a more cost-effective option, fill a bottle with water and place it into your cistern. This will displace the water in the tank and ensure you use less each flush.



Plant Indigenous species that require less water.



Prevent up to 70 per cent of water evaporation by using mulch on your garden.



Use greywater or rainwater to water your garden.



Install a drip irrigation system, use a trigger nozzle on your garden hose and repair any leaks in hoses.



Water early in the morning or in the evening when it is cooler to reduce water loss through evaporation.



Familiarise yourself with your local water saving rules and follow them.



Install a rainwater tank and consider planting a raingarden to filter stormwater.

Resources

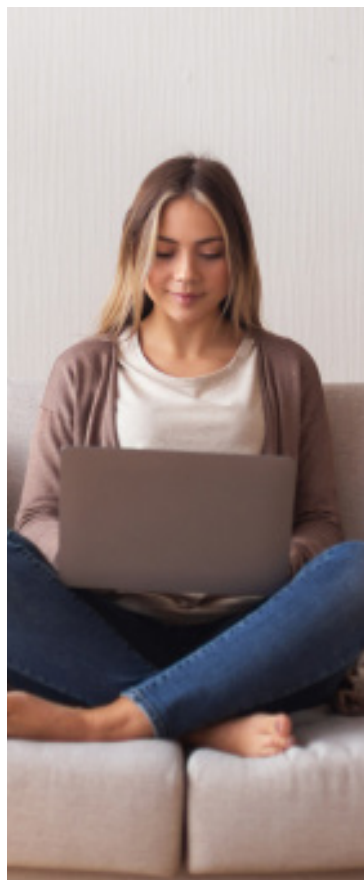
mysmartgarden.org.au

southeastwater.com.au

gleneira.vic.gov.au/sustainability

Action plans and next steps

1. Use your measurements from the tests completed above to identify what steps you need to take.
2. Write these steps into an action plan and invite your family/ housemates along with you.
3. Make changes and start seeing the benefits!



Further inspiration?

Borrow from our range of home energy efficiency library books:

The Big Switch — Saul Griffith (2022)

Positive Energy Homes — CSIRO (2017)

The Energy-Freedom Home: How to Wipe Out Electricity and Gas Bills in Nine Steps — Beyond Zero Emissions (2015)

Houses that can save the world — Courtenay Smith (2022)

GreenHomeBuilding: Money-Saving Strategies for An Affordable, Healthy, High-Performance Home — Miki Cook (2014)

Eco-houses: Sustainability & Quality of Life — Anna Minguet (2021)

The Sustainable House Handbook: How to Plan and Build an Affordable, Energy-Efficient and Waterwise Home for the Future — Josh Byrne (2020)

WATER

Action item	Quick win (\$0–\$200)	Save up (\$200+)
Turn down hot-water system	✓	
Change over shower head to four-star shower head	✓	
Replace washer on leaking hot water tap	✓	
Investigate a heat pump hot water service for your next system		✓

ENERGY

Action item	Quick win (\$0–\$200)	Save up (\$200+)
Draught-proof around external door and kitchen windows	✓	
Install insulation where missing	✓	✓
Add blinds or curtains to keep heat out in summer		✓
Plant deciduous plants in front of any north and/or west facing windows	✓	
Change bulbs over to LED lights	✓	
Add shade sails to shade external north wall	✓	
Install double glazing or window film		✓
Replace gas heating with an efficient reverse cycle air conditioning system		✓
Only fill the kettle with the water needed and make sure to use the water soon after it's boiled	✓	
Change fridge to the recommended temperature	✓	
Upgrade old and inefficient appliances with energy efficient versions		✓
Install solar panels and consider a battery		✓
Turn off TV at the wall overnight	✓	
Get a wireless in-home energy monitoring device	✓	

Kit equipment guide

Thermal imaging camera instructions

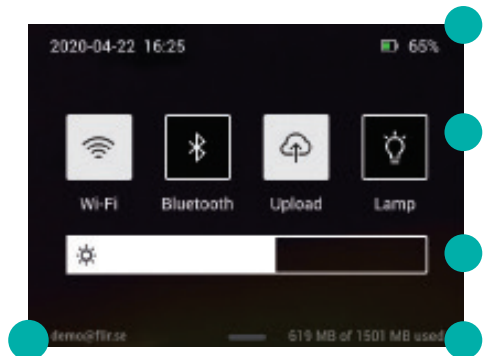
Parts

1. On/off button
2. Save button
3. Camera lamp
4. Infrared lens
5. Visual camera lens
6. Lanyard attachment point
7. Tripod mount
8. USB-C connector
9. Camera screen



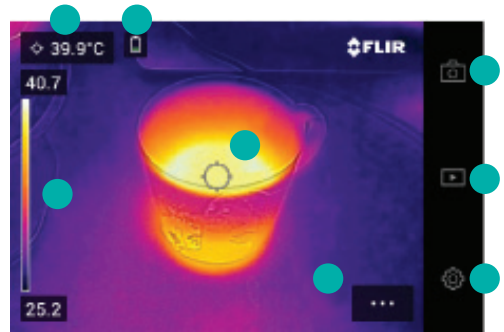
Swipe-down menu

1. Battery Status Indicator
2. Control Buttons:
 - » Wi-Fi button — Tap to enable or disable Wi-Fi
 - » Bluetooth button — Tap to enable or disable bluetooth
 - » Upload button — Tap to enable or automatic upload of images
 - » Lamp button — Tap to turn on/off the camera lamp
3. Screen brightness slider:
Used to control the brightness of the screen
4. Camera memory indicator
5. The FLIR Ignite user account that the camera is paired with



Screen elements

1. Temperature reading of spotmeter
2. Battery status
3. Live view button
4. Gallery button
5. Settings button
6. Menu button
7. Spotmeter
8. Temperature scale



Menu system

Tap the menu button **⋮**,
to display the menu system

Main menu toolbar

Image Mode **🖼️**

Change the image mode
(It is recommended to use the
default thermal MSX mode)

Measurement **📏**

Add/remove measurement tool

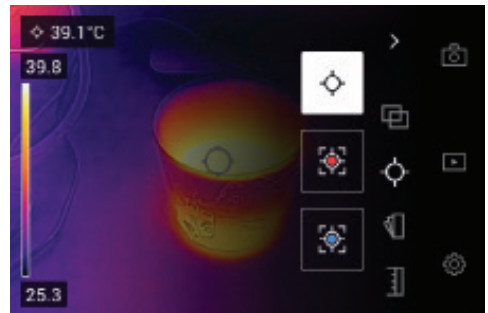
Colour **🎨**

Change the colour palette (It is recommended to use the Iron colour palette)

Temperature Scale **📊**

Change the temperature scale limits (the image will be auto-adjusted
based on the thermal content around the test area with Auto **🔍** option.

Manual **👉** allows you manually adjust the temperature scale and lock the
temperature limits by tapping the chosen upper and lower limits.)



Status icons





Battery status indicator.

- » when the battery status is 20–100 per cent, the indicator is white
- » when the battery is charging, the indicator is green
- » when the battery status is below 20 per cent, the indicator is red






The remaining storage capacity of the camera memory is below 100 MB.

Quick steps

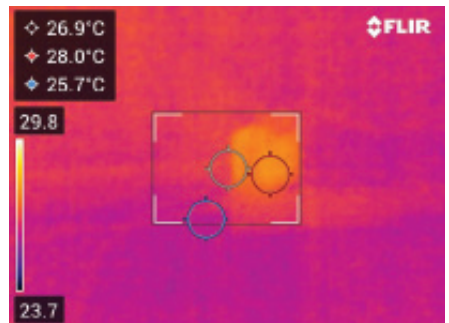
1. Push the on/off button to turn on the camera (small black rectangular button on top of camera) 
2. Point the camera at an internal wall area in your home and read the temperature in the top left of the camera screen. This is a reference temperature reading. (The Image Mode should be the default setting: Thermal MSX)
3. For optimal results, stand 1–2 metres back from the area of the building that you want a temperature reading for (eg. vents, door frames, skirting boards etc). Point the spotmeter  on the camera screen at the target area and read the temperature in the top left of the screen




A one metre distance will be able to pick up a cold/warm spot 10mm in size, if you want to test an entire wall or something larger, increase your distance.

4. To measure the hottest and coldest spots within the test area, tap Measurement  > Hot spot box  and Cold spot box . The camera now measures the temperature with a box and identify the hottest and coldest spots within the box.


Tap the Hot spot box  / Cold spot box  function, to turn off the feature



5. Press the Save button to capture and save the image (large rectangular button on top of camera). Images are saved in the Gallery 








For very accurate results, we recommend that you wait five minutes after you have started the camera before measuring a temperature.

6. Tap Settings  > Measurement parameters to modify the parameter setting. The following are the recommended measurement parameter values already pre-set, please leave as is:

Emissivity	0.95
Reflected temperature	20°C (69°F)
Relative humidity	50%
Atmospheric temperature	20°C (69°F)
Distance	1 m (3.3 ft.)

Working with images

1. Go to Gallery .
2. Tap the folder icon to view the saved images.
3. Tap on the image and to view the thermal and digital image. Scroll down to view all thermal and visual information (Tap  and choose the Edit option to manually adjust the image)
4. Saved images can be transferred to a computer using the USB cable. (Users can also capture images of the generated thermal image camera image on their respective mobile phones)
5. Select an image, tap  and tap Delete to delete the image.
6. To delete multiple images, select  and tap . Select Delete from the displayed dialog box.



Please delete all photos from thermal imaging camera before it is returned to the library

Charging the battery

You can charge the battery with a standard USB power adapter or by connecting the camera to a computer. The battery status is displayed on the swipe-down menu. Disconnect the camera from the power supply once the battery is fully charged.



Tips

- » stay away from live electrical components and never point at someone's face or eyes
- » a reading from a matte surface (eg. a low gloss painted wall) is more accurate than a highly reflected surface, which may appear warm or cold in the camera because they reflect the surrounding environment
- » avoid direct sunlight on the areas you are inspecting and don't point the infrared camera (with or without the lens cover) at strong energy sources (eg. the sun). This can have an unwanted effect on the accuracy of the camera and can cause damage to the detector in the camera
- » do not use the battery if when you use, charge, or put the battery in storage it has an unusual smell, feels hot, changes colour/shape or is in an unusual condition, please return to Glen Eira Libraries and alert a staff member

Power-Mate instructions

The Power-Mate Lite provides insights into the running cost, energy use, greenhouse gas (GHG) emissions and expected meter readings of an appliance. It also has a selectable timer function built in for taking readings of an appliance over a pre-set period. The meter can measure appliances up to 2400 watts (2.4kW). The values will change as the appliance draws more or less power.

Useful measurements

- » Power — the actual power used at the time of measurement. Measured in watts (W). 1000 watts is equal to 1 kilowatt (kW).
- » Energy — this is what the retailer charges for. Measured in kilowatt hours (kWh). 1000 watts equals one kilowatt. A device using one kilowatt for one hour has used one kilowatt hour of energy. Similarly, using five kilowatts for two hours uses 10 kilowatt hours (kWh)
- » Cost — Retailers charge per kilowatt hour of energy used. The Power-Mate Lite can use your electricity rate to give appliance running costs. This function requires you to enter your charged electricity rate into the meter.
- » Greenhouse Gas Emissions — Emissions are produced during electricity production. This meter can calculate the amount of greenhouse gas produced per hour, quarter, year, or other measured length of time. This function requires that the greenhouse gas coefficient be entered into the meter.



SAFETY TIPS

- » The Power-Mate is an electrical device and should not be opened or tampered with. If you have any concerns about its operation or believe there may be a fault, please return it to the library and inform staff
- » Please read the instructions carefully
- » Do not use the Power-Mate in wet areas or outdoors
- » The Power-Mate should only be used with mains power appliances up to a maximum of 10 amps (2400 watts). The majority of small home appliances will not exceed 10 amps. The appliance power or current rating will usually be written on the label or body of the appliance. Do not test multiple devices connected with a power board or double adaptor
- » If the current exceeds 10 amp 'WARNING, OVERLOAD' will be displayed. Turn off or disconnect the appliance as soon as possible to avoid damaging the Power-Mate

You can choose to manually control the time or set the timer. For most measurement manual control is the best option.

- » click MENU to scroll to RUNTIME or ENDTIME
- » click and hold MENU to set TIMER DURATION
- » click ZOOM to scroll through the options
- » choosing NOT SET allows manual control of the measurement. Alternatively, you can set the timer duration
- » click MENU to return to the measurement screens
- » to start measuring click RUN. An arrow will flash in the corner of the screen
- » click MENU to scroll to different types of measurement. Measurement screens will show hourly, quarterly and yearly values
- » REAL is the value for the actual amount of time you have measured. To stop measuring click RUN
- » to reset the measurement click and hold RUN. COMFIRM CLR DATA will appear
- » click RUN to select yes. It is important to do this step for each new measurement

Making your first measurement

- » plug an appliance into the piggy-back plug of the Power-Mate and switch on the appliance
- » click and hold RUN until prompted to 'clear all data'
- » click RUN to select yes
- » now click RUN to start your measurement
- » click MENU to scroll through measurement types. Record your data on an energy audit worksheet

Don't forget to "clear all data" between tests.

Measuring appliances

For an appliance, like a washing machine or dishwasher, knowing how much a load/cycle costs is extremely useful. These appliances use different amounts of power at different times during a load, and for different settings.

To measure these types of appliance start the Power-Mate before you start the appliance. When the appliance has finished stop the Power-Mate.

The Power-Mate readout for REAL is the measure of the energy/cost of the load/cycle.



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Thank you for borrowing our Home Energy Kit.
Small actions make a big difference when we all
work together.

We hope that this Kit provides a positive sustainable
outcome for you and your home.

Thank you for being part of the solution.

If you'd like to share your experience of this
Home Energy Kit, we'd love to hear from you!



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