



Home Energy Toolkit Instruction manual

Be home smart. Live better.

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Home Energy Toolkit

Understanding how your home uses energy is the first step to creating a **warmer, drier home** that is also **cheaper to run**. The tools in this kit can help you spot simple changes you can make - often with little effort and at low or no cost - to improve your home's energy efficiency.

An energy-efficient home is easier to heat and keep dry, and it can help keep you and your whānau healthy. The average New Zealand household spends around \$2,500 per year on energy and heating. By making some changes, you may save hundreds of dollars every year.

In this toolkit you will find:

- Instructions on how to use each tool.
- Tips on how to make your home more energy efficient.
- A separate record sheet - yours to keep. This sheet has space to record your energy measurements, as well as a list of websites where you can find further information and support.
- This energy toolkit is a joint initiative from Alpine Energy, Timaru District Council, Waimate District Council, and Mackenzie District Council. Together, we're supporting whānau and individuals across South Canterbury to live in homes that are warmer, drier, healthier, and more affordable to run.

What is in this toolkit?

Tool	What does this help with?	Time needed
(1) Hygrometer/Thermometer	This device measures the temperature and humidity in your home. Both are very important to prevent mould and to keep your heating costs low.	5 Minutes each day over a week
(2) Moisture meter	This device measures the humidity in your firewood. Drier wood burns hotter, and you get more out of your money's worth.	5 Minutes
(3) Stick thermometer	This device measures the water temperature to see if your hot water cylinder is set to the best temperature to keep you healthy and your water warm.	5 Minutes
(4) Infrared thermometer gun	This device helps you find cold spots and gaps in your insulation, where heat leaves your home.	10 Minutes
(5) Stopwatch	Check how much water comes out of your taps and shower with the stopwatch and a bucket.	5 Minutes
(6) Power meter	Measure and calculate how much electricity some appliances in your home use, so you can run them efficiently.	5 Minutes before and after you use an appliance



Thermometer Hygrometer

The temperature and humidity in your home can have a big impact on your health. Both are important to keep you and your whānau warm, keep your heating costs low, and prevent harmful mould.

Move the **Thermometer Hygrometer** into different rooms each day. Write the temperature and humidity down on your **record sheet**.

Measuring temperature and humidity

1. Press the “24 HRS/ ALL TIME” button on the back of the thermometer hygrometer for 3 seconds. The max/ min number will reset and show “--”.
2. Place the device in different rooms (bedrooms, living room, bathroom, kitchen), close to where you usually spend time. Keep the thermometer hygrometer out of direct sunlight and away from heaters. Measure each room over a 24-hour period, so you know the temperature and humidity both during the day and at night.
3. Before you move the thermometer hygrometer to the next room, note down the max/ min temperature and humidity for the past 24 hours on your record sheet.
4. If necessary, change to the 24-hour mode by pressing the “24 HRS/ ALL TIME” button once to change between modes

Did you know?

- * The recommended temperature to keep you warm and healthy is between 18°C and 22°C. Temperatures too high or too low can impact your physical and mental health.
- * The more moisture you have in the air, the more energy you will need to warm up your home. High humidity also contributes to harmful black mould growth. The recommended indoor humidity is between 30% and 50% but will swing with the weather.

Small fixes to keep your home warm and dry

Tackle and prevent high humidity in your home:

- Air your home regularly to get rid of stale air and excess moisture. Opening all doors and windows for 10 minutes each day is a great way to do this. If you can, air your home during the warmest hours of the day, especially in winter.
- Dry your washing outside to prevent further moisture from entering your home.
- Use the range hood in the kitchen while you cook and cover your cooking pots with a lid. Use the extractor fan in the bathroom while you shower. If you don't have those, open a window so the moisture from hot water can escape.
- Wipe excess moisture off windows or the shower wall with a cloth or old t-shirt and wring it out over the sink.
- Consider buying a dehumidifier to remove excess moisture from your home. Keep an eye out for bargain deals at stores and on Trademe.

Warm your home without paying a fortune:

- Set your aircon to 18-22°C while you are home. A higher setting won't bring the temperature up much faster.
- Close the curtains at nighttime to keep the heat in. If you don't have curtains, try draping a blanket over the window to create an insulating layer of air.
- Only heat up the rooms that you are using, and close doors to rooms you are not in.
- An electric blanket goes a long way to keep you cozy in bed. Turn it on a few minutes before going to bed, but make sure you turn it off before falling asleep. Check your electric blanket regularly and replace at the first sign of damage to avoid injuring yourself or starting a fire. Fire and Emergency recommends replacing your electric blanket every five years.



Watch the instructional video on YouTube:
www.youtube.com/watch?v=F3vngKiNIRw

Moisture Meter For Firewood

Use the **Moisture Meter** to check how dry your firewood is. If the wood is too damp, your fire will not burn the wood efficiently and produce less heat and more smoke.

It's best to check your wood when there is not too much moisture in the air outside e.g. do not measure immediately after it has rained.

Measuring your firewood moisture content

1. Turn the moisture meter on (Make sure the tree symbol (🌳) is showing. If the “H” is showing, press the “ON | Set” button again.

“H” stands for “hold”, so when H is active the % value displayed will not change. You can lock in a value by pressing the ON | Set button, and release the value by pressing the button again.

2. Take off the cap and push the prongs into the end of the wood as far as possible.
3. Write down the measurement in your record book.
4. Put the cap back on.

Note: The moisture meter turns off automatically

Did you know?

- * Dry wood burns efficiently: it produces more heat per log while also burning with less smoke and emissions, compared to green or wet wood. If you use dry wood, you will need less wood to maintain the heat in your home.
- * Dry wood releases more heat because the energy isn't wasted evaporating water. The evaporated water can contribute to high humidity in your home and impact your health.



Watch the instructional video on YouTube:
www.youtube.com/watch?v=l-iiJ9YH59U

Dry your firewood with simple steps

- Split logs into smaller pieces, stack them loosely with good airflow, and protect them from rain while still allowing exposure to sun and wind. If you don't have a shed to store your firewood, cover the top of the wood stack with a tarp or other cover to protect it from rain.
- Keep firewood off the ground using pallets or a shed with a raised floor to prevent moisture absorption.
- Aim for a moisture content of 20% or less.

Seasoning firewood takes time, typically 6-12 months, but can vary depending on wood type and climate. If you have space, buy your firewood in advance to the cold season. If space is tight, see if you can buy already seasoned firewood. Compressed firewood is also a great option if you can't buy or dry firewood easily.



Stick Thermometer

Use the **Stick Thermometer** to check your hot water temperature is set correctly.

Measuring your hot water temperature

1. Press the left side button to turn the thermometer on.
2. Remove the protective cap from the stainless steel probe end.
3. Go to the hot tap that's closest to the hot water cylinder and run it on full until the water is at a steady temperature.
4. Insert the stainless steel tip of the thermometer under the stream of water. Allow temperature to be constant before recording the temperature. This can take up to 1 minute.
5. Wipe the probe clean and dry after use and replace the protective cap.
6. Press the left side button to turn the thermometer off.

The ideal hot water temperature coming out of your water taps is between 50°C to 60°C. This is hot enough to mix with cold water for your everyday use, without burning your skin or running out too quickly. If your hot water cylinder is further away, the water will cool down more on its way out of your tap.

Did you know?

- * Hot water is about a third of your home energy use.
- * The temperature of your hot water cylinder is set to 60°C or higher to kill off harmful bacteria.

How to fix your hot water temperature

- Wrap your hot water cylinder and hot water pipe with specialised insulation material to prevent heat loss. Insulated hot water cylinder and hot water pipes mean you are heating the water, not the cupboard – this will help you keep costs low.
- Check what temperature your hot water cylinder is set to. If necessary, adjust your thermostat if your hot water is too hot or too cold. Remember to set it to a minimum temperature of 60°C to prevent bacteria from growing. You may need a plumber for this.



Infrared Thermometer

The **Infrared Thermometer** measures the surface temperature of what it is pointed at. The Thermometer can show you cold spots on your windows, window frames, walls, or floor. This is where the cold seeps in, and heat leaves your home.

It is best to use the Infrared Thermometer when inside temperatures are different to outside - e.g. on a cold evening and when your house is warm. With a bigger temperature difference, it is easier to find small gaps and air leaks.

Measuring surface temperature

1. Hold the infrared thermometer by its handle grip and point it at the surface being measured (e.g. a wall or ceiling) The closer you are to the surface the more accurate it will be.
2. Pull and hold down the trigger to start measuring. You will see a red laser light where the measurement is taken. Do not point this at someone's face as the laser can cause permanent eye damage.
3. Keep holding down the trigger and slowly move the infrared thermometer across different surfaces. Allow a second for the temperature to adjust.

Did you know?

- * Heating accounts for about a third of your home energy use. To lower your energy use, insulate your home and keep the heat in – a one-off investment that will save you every day!



What are you checking for?

- When you check the floor or ceiling, the temperature should stay consistent across the whole room (within a few degrees). If you find a spot that is cooler, this could mean that the insulation has been dislodged or was poorly installed. Check and fix the insulation placement in your ceiling and under the house, and fill gaps with more insulation material.
- If you find air leaks around windows and doors, use weather seal or foam strips to close gaps. These strips of foam come in different thicknesses, widths and colours to fill all kinds of gaps precisely.

Fix heat leaks – quick and cheap!

- If you have gaps in your windows, fill those with weather seal. These rolls of foam with a sticky side like tape exists in different thicknesses, widths and colours to match your windows. Fit it by sticking it in the gaps until the window closes flush.
- If you have gaps under your doors, you can install a draught guard. Fill any gaps around the frame with weather seal and foam strips as well. If you don't want to buy a draught guard, a rolled up towel can help temporarily.
- If you have single glass windows, the heat will leave your home through the glass. Install a DIY double glazing kit or stick bubble wrap to your windows to create an insulating air layer. Drawing the curtains at night helps the heat to stay in.
- If you have gaps in your ceiling or floor insulation, check if you can move it back into place or add some extra insulation in the places you need to.

If you don't have floor or ceiling insulation installed, check if you are eligible for a Warmer Kiwi Homes grant on the EECA website (link on your record sheet).



Watch the instructional video on YouTube:
www.youtube.com/watch?v=UunPLD8mkhg



Watch the instructional video on YouTube:
www.youtube.com/watch?v=AbdE54-XHWo

Stop Watch

Use the **Stopwatch** to measure how much water your shower and taps use per minute - the flow rate.

Things you will need: the stopwatch from this home energy toolkit, a container to collect water, a measuring container (if your other container doesn't have measuring lines), and a calculator.

Measuring the water flow rate

1. On the stopwatch, press M and S at the same time to reset the clock. Then press S six times to set the timer to six seconds.
2. Set up your container in the shower. Set the shower handle to your normal showering temperature.
3. Start the shower at full flow and press the red Start/ Stop button at the same time.
4. When the timer runs out, stop the water.
5. Check how much water is in the bucket. If your bucket doesn't have measuring lines, use a measuring container.
6. Multiply the amount of water you collected times ten. This will give you the amount of water per minute.
(6 seconds x 10 = 60 seconds = 1 minute)

Note: If there is no sound for the timer, flick the switch on the back of the stopwatch to "on". The stopwatch does not turn off.

Did you know?

- * Hot water is about a third of your home energy use.
- * The recommended flow rate for your shower is 10 litres or less per minute. The recommended flow rate for your water taps is around 4-6 litres per minute. By reducing how much hot water you use, you automatically save on your power bill.

Tips to use less hot water

- The flow rate for most showers is around 10 litres per minute. If your shower has a higher flow rate, you can reduce your hot water consumption by installing a water saving shower head.
- Consider a timer or clock in your bathroom to shorten your showers. A 20min shower can use as much water as a full bathtub.
- The recommended flow rate for kitchen taps is around 4-6 litres per minute. If your kitchen tap has a higher flow rate, you can save water by installing an aerator or flow reducer disc.
- Run your dishwasher when it is full - it will use less hot water than doing dishes by hand. If you do a quick manual wash, fill the sink rather than washing dishes under running water to save hot water.



Watch the instructional video on YouTube:
www.youtube.com/watch?v=-xT_diwaOYg

Energy Cost Meter

The **Energy Cost Meter** measures how much energy one of your appliances uses over a certain time period. Multiply this with the cost for your electricity and it will tell you how much running an appliance costs.

We recommend using the energy cost meter for energy intensive appliances such as the fridge, dish washer, washing machine, dryer, plug in heaters, dehumidifier, gaming computer and so on.

Using the energy cost meter to measure usage

1. Find the variable electricity charge on your electricity bill. This will be the charge for your "uncontrolled" electricity. The unit for this will be kWh, or kilowatt per hour. Write this down in your record sheet. If you can't find the variable charge on your power bill, assume an average \$0.35 per kWh.
2. Plug the energy cost meter into a socket near the appliance you want to test. Plug the appliance into the energy cost meter (which is plugged into the wall socket).
3. Press "Master clear" with a hair pin or paper clip to reset previous measurements (no sharp objects). Press the "FUNC" button until the energy cost meter displays "kWh" (the unit of power consumed). This will show you how much the appliance uses over time. Leave the appliance running for a while, e.g. for a day if it is on permanently, or over a cycle for a washing machine or dish washer. Write this number down as the "power usage" on your record sheet. 1kWh is equal to 1kW (1000 Watt) used over one hour. Some appliances have the Watt or kW usage written on them. Multiply the kW with the time the appliance is running (in hours) to calculate the used kWh. This will give you an instant measurement of how much power an appliance uses.

For more accurate readings, try recording the power used over a longer period, for example 12 or 24 hours.



Watch the instructional video on YouTube:
www.youtube.com/watch?v=rwvlhesFJ9A

How can you save costs running household appliances?

A good awareness for how much your appliances cost you is the basis for improving your usage.

- Make the most of a time of use electricity plan by using the energy intense appliances when power is cheapest.
- If you have appliances that you only use occasionally, turn them off at the wall when not in use. For example, party fridges and (almost) empty chest freezers.
- Plug in heaters are great to keep you warm but use a lot of electricity. Turn them off when you leave the house.
- Old appliances are often less energy efficient than new appliances. When you need to replace one, be sure to check the energy efficiency rating.
- You can also experiment and find out e.g. how much more a hot wash versus a cold wash costs you, by measuring electricity usage for both on separate cycles.





All done?

We would love to know what you think of the kit and have any ideas for improvement. Please fill out the feedback form included or simply email mailbox@alpineenergy.co.nz

If you have found any of the tools are faulty or batteries need changing, please let a librarian know when returning this kit.

A joint South Canterbury initiative, brought to you by:

