WHARE ORA
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Energy in the home

Aotearoa New Zealand

Whakatauki
Māori proverb

**"Hurihia to aroaro ki te ra,
tukuna to ātārangi ki muri i a koe"**

***Turn and face the sun and
let the shadows fall behind you***

Te Hopu a Maui i a te Ra

How Maui slowed the Sun

The problem

Every day the sun moves across the sky very, very fast while the earth is left in darkness for many hours. Maui and his brothers were unhappy about this situation as they couldn't finish their mahi each day and see their kai which had been cooked in the hangi. Maui came up with a cunning plan to solve this problem and told his brothers that he was going to capture the sun and slow it down. He was already well known for his fearless plans like the time he decided to catch the largest fish in the world which just happened to be Te Ika-a-Maui (the North Island of Aotearoa New Zealand).

The plan

Maui had the magical jawbone of his ancestor, Murirangawhenua which he believed would help him catch the sun. His village collected flax which was woven into long ropes. Then, with the protection of darkness, Maui and his brothers set off on their mission to find the place where the sun rose in the sky each day. They were careful to hide from the sun to keep their raid as a surprise.

Action

When they reached the deep, scorched hole where the sun slept, the flax ropes were arranged in a noose around the sun's resting place. The brothers waited.

At last, morning came, and the sun started to rise. It was shocked to realise what the brothers were trying to do, becoming furious! The intense heat and fire terrified the brothers who tried to escape. Maui made them stay. They pulled on the ropes as hard as they could while Maui used his ancestor's magical jawbone to spear the sun. This angered the sun even more and it shot out fireballs in retaliation. Maui used his mana to command the sun to slow its daily journey across the sky and, after a great battle, the sun agreed. The brothers loosened the flax ropes allowing the sun to move slowly across the sky.

So, thanks to the bravery and cunning plan of Maui and his brothers, the sun now makes a slow journey across the sky each day which gives everyone enough time to complete their mahi.

What is energy?

- Energy gives us the power to do work which means it helps us to do things we would otherwise not be able to do.
- For example, the stored energy (called chemical potential energy) in firewood, coal or oil can be changed into heat and light energy.
- The stored energy in petrol, allows us to use a chainsaw to do the work it would otherwise take us ages to do (cutting down a tree).
- The stored energy in the food we eat gives us the energy to do different jobs every day. We know that some foods contain more energy (like chocolate) than other foods (like lettuce!).

How is energy used in the Aotearoa New Zealand home?

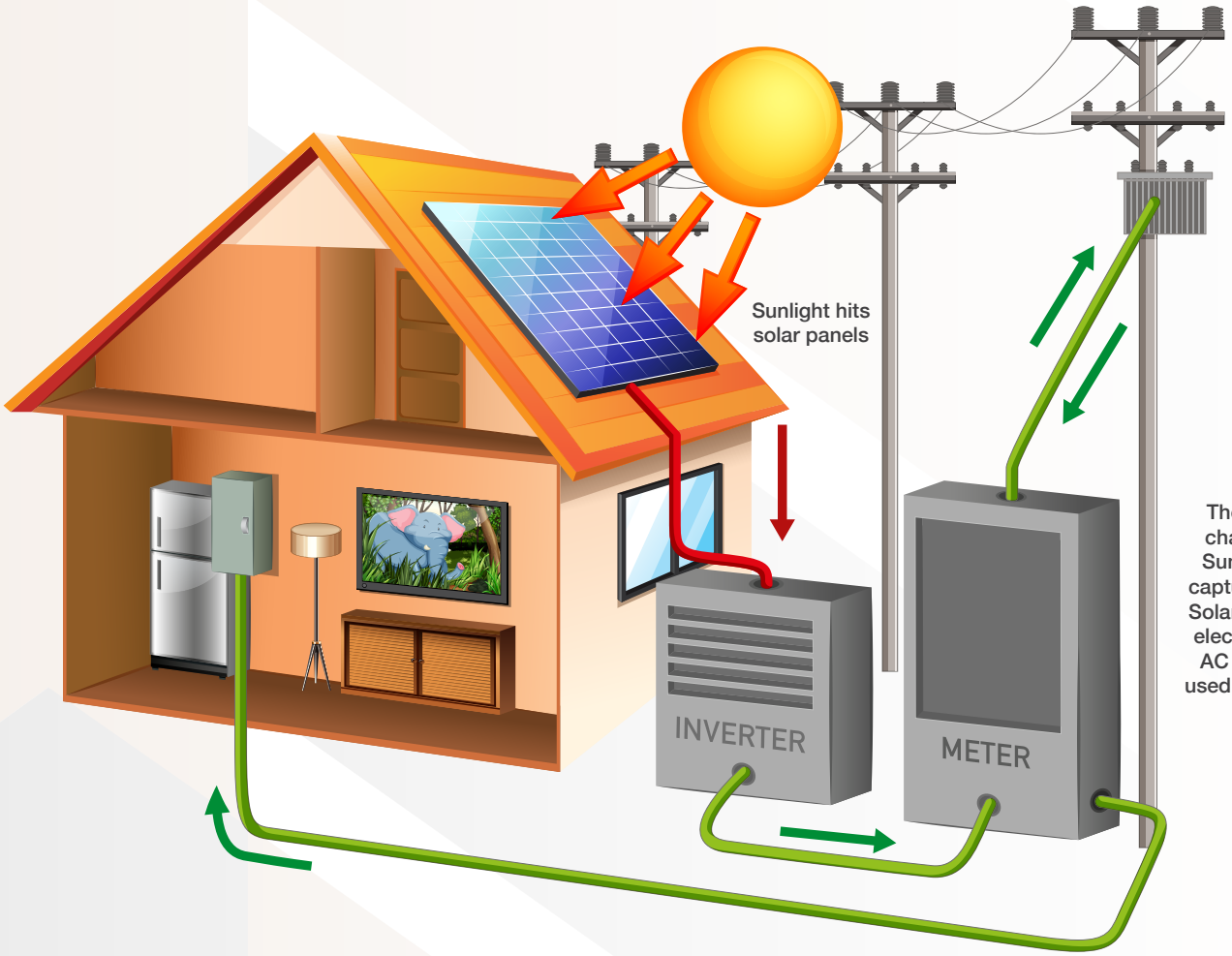
Below is a table showing how different household activities affect your power bill

Power bill %*	Household Activity	Image	Power saving tips
27%	Hot water heating		Have shorter showers, fix dripping hot water taps, wash clothes in cold water. A hot shower will cost you about 75c for 10 minutes. A load of washing using cold water will only cost you about 4c (40c using warm water). Make sure your hot water thermostat is set to only 60 degrees C.
20%	Electronics		These gadgets can be anything from phone chargers to TVs (even on standby) to gaming consoles.
17%	Refrigeration		A new fridge / freezer will cost you about 30c per day whereas an old one, much more. Check that the seals close and doors shut properly on these appliances.
15%	House heating		Use thermal backed curtains and, in cold weather, pull them before the sun goes down to trap the heat in the house. Only use dry firewood. Try not to use un-flued gas heaters as they put a lot of moisture (creating dampness and mould growth) into the air. Use draught stoppers on windows and doors.
13%	Lighting		Change to energy efficient LED bulbs. Each high use bulb can save up to $20 per year.
5%	Cooking		Use a range hood to remove moisture produced during cooking. This keeps the air in the house drier and warmer preventing mould growth.
3%	Clothes drying		Clothes driers cost more than $1 per load. Dry clothes outside as often as possible and use a drier only to finish drying.

*These percentages are estimates only

What is solar energy and how does a solar panel work?

Solar (sun's) energy is the light and heat that come from the sun. People can collect the sun's energy in a few different ways: Photovoltaic (photo means light and voltaic means electricity) cells (solar panels) change sunlight into electricity. The sun is a renewable energy source.



The Inverter changes the Sun's energy captured by the Solar Panel (DC electricity) into AC electricity used by the Grid

Renewable and non-renewable energy sources

Renewable Energy

BIOMASS HYDROPOWER WIND GEOTHERMAL SOLAR

Non-Renewable Energy

COAL OIL NUCLEAR NATURAL GAS

Renewable energy is sustainable meaning that it is constantly being renewed. Hydro, wind, tides, geothermal and sunlight are all examples of renewable / sustainable energy. As climate change and pollution from fossil-fuels become big problems, the use of renewable energy is becoming more important. The sun (solar energy) isn't going to run out of energy any time soon.

Non-renewable energy sources are energy sources that, once used up, can never be replaced, or renewed. Coal and oil are just two examples of non-renewable energy sources.

In just one hour, the energy from the sun reaching the earth, is enough to power all the electrical energy needed by the whole earth for a year!! We are not all using solar power because it is difficult to store all this energy (power). Even though the technology needed to do this is getting better all the time it still costs quite a lot of money.

Are you an Energy Expert?

Have a go at answering this quick, easy quiz

1. Name the famous Māori warrior who slowed down the sun.
2. What special power does energy give us?
3. Can you name one type of food that gives us energy?
4. Name two things you can do at home to save money on hot water.
5. How can old fridges or freezers waste electricity?
6. In colder months, why is it a good idea to close the curtains or blinds before the sun goes down?
7. How can cooking or drying clothes in the house cause mould to grow?
8. Where does solar energy come from?
9. Can you give one example of a Renewable energy source?
10. What does non-renewable mean?

QUIZ ANSWERS

1. Maui **2.** Energy gives us the power or ability to do work **3.** Bread, lollies, sugar (there are lots!!) **4.** Have shorter showers, wash clothes in cold water, check the thermostat on your hot water cylinder **5.** The seals are old and don't keep the cold air inside **6.** Closing them keeps the warm air inside the house **7.** They put water (moisture) into the air which mould needs to grow **8.** The Sun **9.** Tidal power, solar, geothermal, wind **10.** It can't be renewed or used again and again

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Household Energy Use ASSESSMENT/AUDIT

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YOUR NAME: _____

HOME ADDRESS: _____

CONTACT PHONE AND/OR EMAIL: _____

HOUSE HEATING AND COOLING	Yes	No	Does not apply
Is the heating or cooling system in your house less than 10 years old?			
Does this system get serviced regularly?			
Does this system have a thermostat?			
Is the temperature set between 17 and 24 degrees C?			
Do you use ceiling fans?			
HOUSE INSULATION	**Yes**	**No**	**Does not apply**
Is the roof of your house insulated?			
Are the walls of your house insulated?			
Does your house have underfloor insulation?			
Are there gaps around doors, windows and in the walls which let in draughts?			
WINDOWS	**Yes**	**No**	**Does not apply**
Are the windows tinted?			
Do you have double glazing on windows?			
Do your window coverings have thermal backing?			
Are your windows made of aluminium with no gaps?			
WATER HEATING	**Yes**	**No**	**Does not apply**
Do you take short (3 to 5 min) showers?			
Do you have a water saving shower head?			
Are the hot water pipes lagged or insulated?			
Is your hot water cylinder insulated?			
Is the hot water temperature set at 60 degrees C?			
Do you have any leaking hot water taps or pipes?			
HOUSEHOLD APPLIANCES	**Yes**	**No**	**Does not apply**
Do your appliances have energy star ratings?			
Are your appliances plugged into power boards?			
Do you wait until you have a full load to run your washing machine or dishwasher?			
Are your clothes washed in cold water?			
Do you dry wet washing outside?			
Does your fridge door have a good seal?			
Does your oven door have a good seal?			
Does your freezer have ice build-up?			
Do you leave appliances on stand-by?			
HOUSEHOLD LIGHTING	**Yes**	**No**	**Does not apply**
Do you turn off lights in unoccupied rooms?			
Do you use energy efficient bulbs?			
Do you use smaller lights / lamps rather than big lights?			

***For office use only:** Equipment to be installed in houses located at Ruatāhuna, Minginui and Te Whāiti*

- ☐ 12-volt LED lights (average rating 6 watts)
- ☐ 12-volt solar electricity system 80 watts
- ☐ Timer for automatic disconnection of devices (TV, Sky decoder etc)
- ☐ Charging port for hand-held devices, phones etc
- ☐ Electric hot water cylinder wrap where needed
- ☐ One litre electric hot water jug

_____

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www.whareora.co.nz