BAY OF PLENTY REGIONAL COUNCIL'S
POLLUTION BUSTERS CLUB

Issue 62 – April 2015

Energy

Tēnā koutou e hoa ma - Hello Pollution Busters!

BuzzBOP and the team hope you enjoyed your summer break and first term of school, it has gone fast!

Thanks to those of you that entered our aquatic pest poster competition. There were some great entries, check out the winner on page two.

This issue is all about something you have loads of, and something we all use every day in lots of different ways. That something is ENERGY!

You need lots of long lasting energy so you can work and play. Eat healthy food, drink plenty of water and get lots of sleep so your body has energy!

Enjoy the holidays and be sure to try out the great energy activities in this newsletter.

"Kia u, kia ngakaunui ki nga mahi pai"

Be steadfast and conscientious in all your good work.

From BuzzBOP and the team at Bay of Plenty Regional Council.

BuzzBOP's Mail

BuzzBOP's bus
by Benji – Age 7, Ōhope

BuzzBOP's solar recycling car
by Buzz's friend – Age 7, Ōhope

COMPETITION WINNER!

Thanks to all of you who entered the last competition. Congratulations to Renee Davies (Age 12) from Te Puke.

SEE PAGE 9 FOR THIS ISSUES ENERGY QUIZ

Send your drawings, photos, letters and competition entries to:

POST: Bay of Plenty Regional Council
Pollution Busters Club
Freepost 122076
PO Box 364
Whakatāne 3158

EMAIL: buzzbop@boprc.govt.nz

Information in this newsletter was sourced from...
Pollution Busters Issue 35 Energy
Bay of Plenty Regional Council's 'Energy' Education Resource
www.energywise.govt.nz / www.eeca.govt.nz / www.med.govt.nz

BAY OF PLENTY REGIONAL COUNCIL
TOI MOANA

What is ENERGY?

Energy is a natural resource,
it is what you need to do work!

Energy makes something happen. It is the power that makes something move, grow, heat up or change into something else. Some examples of this are growing, playing, driving a car, powering a machine, lighting a bulb and even thinking!

Energy can be in many different forms like food, petrol or sunlight – all of these helps a person, animal or machine to do some kind of work.

Energy can change forms when we use it - electricity can change to light, fuel changed to movement, energy from food becomes growth and movement when we eat it.

Some energy sources are better than others and all our **energy resources need to be used wisely.**

ENERGY FAST FACTS:

- **Almost all the energy on earth has come from the sun**
- **All life needs energy (we need it to breathe, move and grow)**
- **Without the sun's energy the earth would be a frozen mass of ice with no living things**
- **Energy can't be created or destroyed – it just changes from one form into another**
- **Heat is lost every time energy is transferred**

What is a renewable energy source that is used every day at your school?
Brain power!

Where does ENERGY come from?

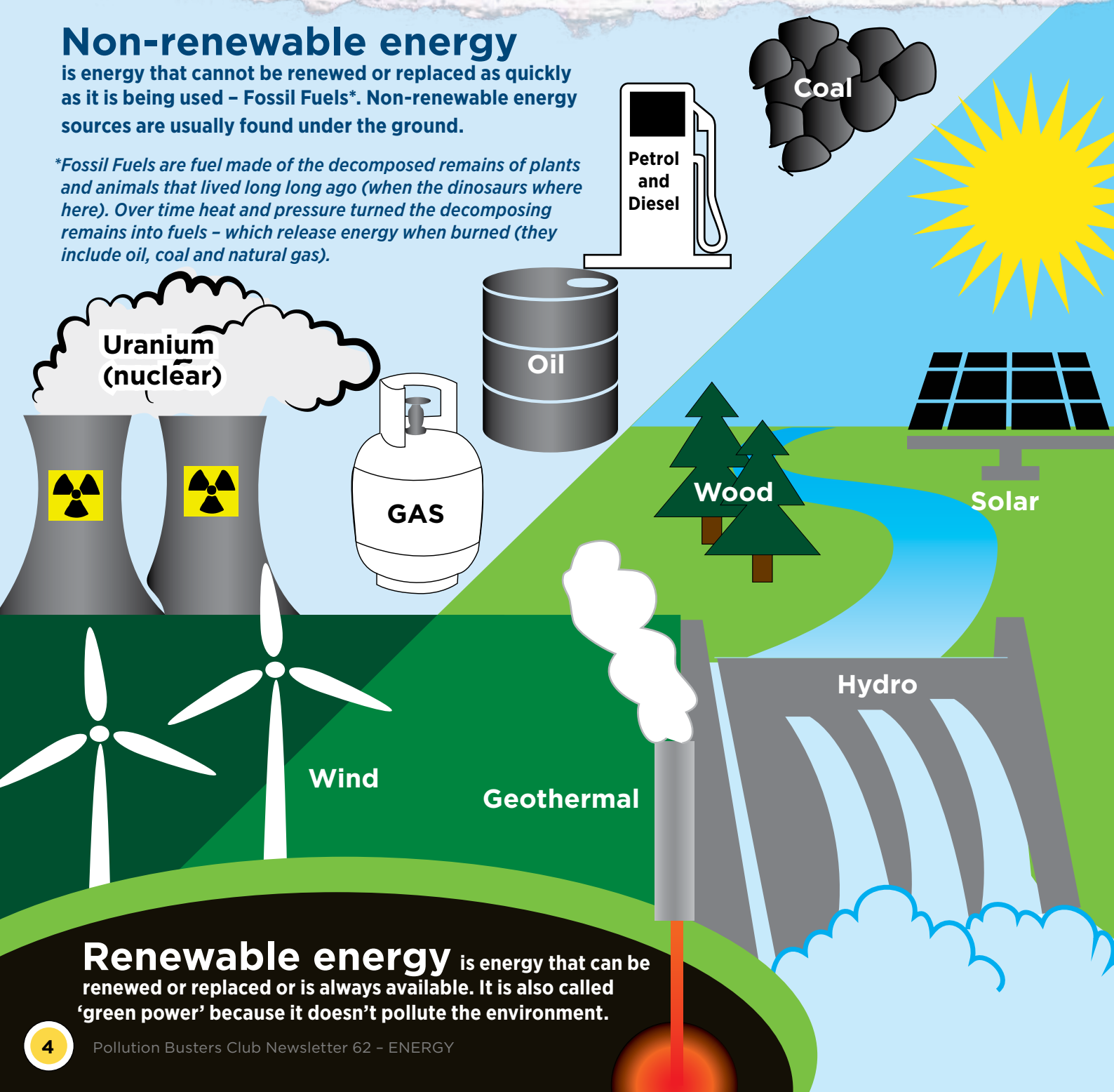
Energy can come from many different sources and in different forms. These also have very different effects on the environment – some are better than others.

Let's take a look at the difference between renewable and non-renewable sources of energy:

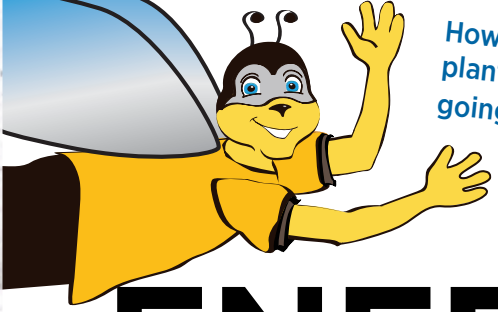
Non-renewable energy

is energy that cannot be renewed or replaced as quickly as it is being used – Fossil Fuels*. Non-renewable energy sources are usually found under the ground.

**Fossil Fuels are fuel made of the decomposed remains of plants and animals that lived long long ago (when the dinosaurs where here). Over time heat and pressure turned the decomposing remains into fuels – which release energy when burned (they include oil, coal and natural gas).*



Renewable energy is energy that can be renewed or replaced or is always available. It is also called 'green power' because it doesn't pollute the environment.

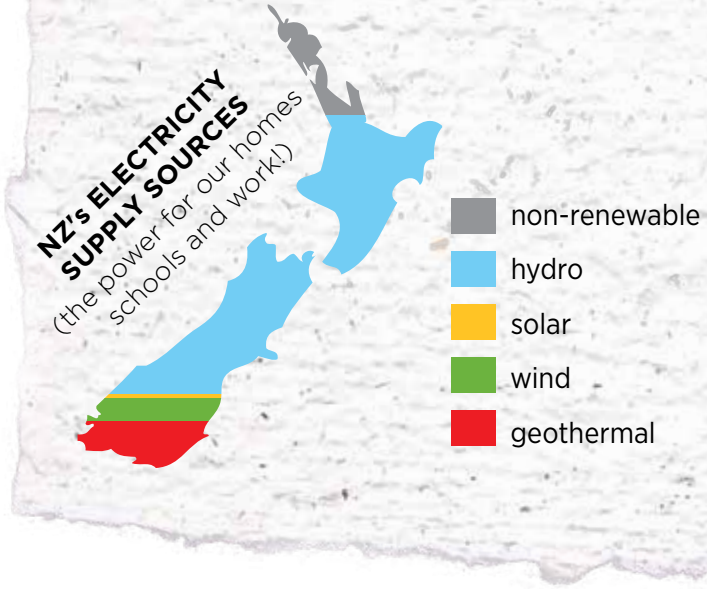


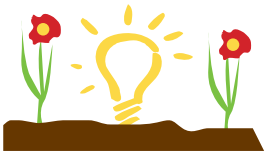
How are renewable power plants like people who enjoy going to the beach?

They all like sun, wind and water!

ENERGY WORD FIND

Y	G	R	E	N	E	W	U	T	B	E	F	E	P	C
L	I	G	H	T	C	C	J	A	L	L	C	L	H	D
L	A	C	I	N	A	H	C	E	M	B	L	A	O	I
C	F	U	E	L	K	B	C	H	E	A	F	S	T	H
T	E	N	W	R	A	T	T	G	I	W	O	T	O	K
M	Q	L	O	T	R	I	H	T	A	E	R	I	V	D
L	U	W	T	I	S	M	N	Y	E	N	C	C	O	E
U	W	E	C	O	T	E	A	T	D	E	E	B	L	R
F	R	I	L	R	T	C	I	G	N	R	R	Y	T	O
Y	T	A	N	O	E	V	A	O	N	G	O	U	A	T
Y	R	B	P	D	R	W	I	J	G	E	X	H	I	S
G	E	N	E	R	A	T	O	R	A	N	T	L	C	U
R	R	I	H	R	O	D	E	P	S	S	T	I	P	V
R	H	Y	Z	M	U	M	F	P	Y	Q	U	Z	C	V
D	N	U	O	S	O	O	G	M	N	E	Z	U	K	K





Why did the gardener plant a light bulb?
He wanted to grow a power plant!

ACTION	HYDRO	SOLAR
BATTERY	LIGHT	SOUND
ELASTIC	MAGNETIC	STORED
ELECTRICITY	MECHANICAL	WIND
ENERGY	MOTION	WORK
FORCE	PETROLEUM	
FUEL	PHOTOVOLTAIC	
GAS	POTENTIAL	
GENERATOR	POWER	
HEAT	RENEWABLE	

Māori and energy

The **riaka** (_____) sources of **ahi** (_____), **tā** (_____) and **rā** (_____) feature a lot in Māori culture. Māori also work with the energy of the **marama** (_____), timing planting, harvesting and fishing with its phases (time of the moon's cycle) so they will be rewarded with better harvests.

Fill in the spaces, use the meanings below to help you.

WORDS AND MEANINGS

riaka = energy
atua = ancestor or god
rā = sun
ahi = fire
tā = wind
marama = moon

Māori ancestors of energy:

Tamanuiterā	The sun
Rūaumoko	Atua of the geysers, hotsprings, volcanos and earthquakes. The youngest child of Rangi-nui and Papa-tū-ā-nuku.
Tāwhiri-mātea	Atua of the winds. Son of Rangi-nui and Papa-tū-ā-nuku.
Mahuika	Guardian of fire, married to the son of Tamanuiterā

Draw or paint a picture of one of these atua and send it to BuzzBOP to use in future newsletters.

Wind energy

Wind is the natural movement of the air (the air in motion). It is caused by the sun heating the earth's surface unevenly making differences in air pressure within our atmosphere.

During the day the air above the land heats up faster than the air over water. The warm air over the land is lighter and rises and the heavier, cold air rushes in to take its place – making winds. At night it is reversed as the air cools faster over land than water.

- Wind energy is clean and renewable.
- Wind turbines generate electricity, sailboats use wind to move, windmills create mechanical energy.
- Large groups of wind turbines are called wind farms.

Windfarms use wind energy to generate electricity. Wind turbine blades are like an aeroplane's wing, as the air flows past the blade it causes lift, this makes them turn. The blades are connected to a drive shaft that turns a generator to produce electricity.

The speed of the wind increases the higher up you are so good places for wind farms are the tops of smooth rounded hills, open plains or shorelines.

ACTIVITY

POWER OF THE WIND
Make a balloon racer!

You will need:

- Toy car
- Straw or small hollow tube
- Balloon
- Sticky tape

What to do:

1. Push the straw inside the balloon, leaving about 25 mm sticking out.
2. Wrap sticky tape tightly around the neck of the balloon with the tube inside.
3. Attach the balloon and tube to the car with tape. Put the straw end at the back of the car.
4. Blow into the tube to inflate the balloon.
5. Keep your finger over the tube.
6. Place the car on the floor and take your finger away.
7. Watch it race away.

You could make more than one and have wind power races with your friends!

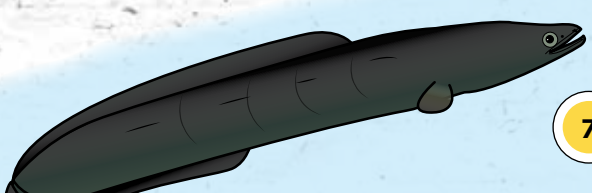
Water energy

Water (hydro) energy is the main form of renewable energy used to generate electricity. Hydropower is generated by the force of falling water (caused by gravity).

A hydroelectric powerplant is made up of a high dam that is built across a river to make lake or reservoir. The force of the water being released from the lake through the dam spins the blades of a giant turbine (wheel) that is connected to a generator. This turns water energy into mechanical energy, then into electrical energy that comes to our houses through powerlines.

After the water passes through the turbine it flows back into the river on the other side and there are no waste products or pollutants. It can effect wildlife like eels and fish that need to swim upstream and rivers to spawn and reproduce as the hydro power dams can get in their way. Most dams now have special places for them get past without getting hurt.

Hydro power makes up about 60 percent of New Zealand's electricity.



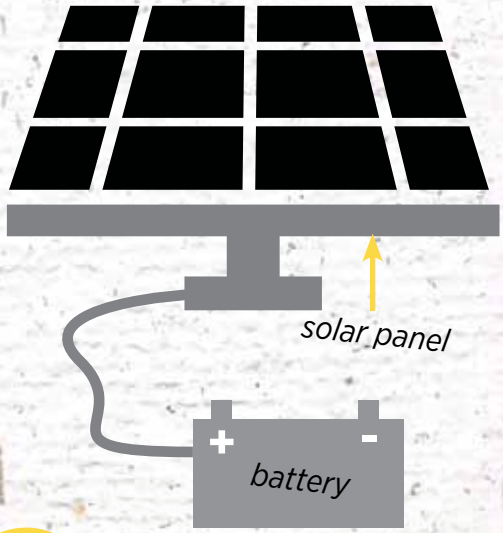
Solar energy

Solar energy is energy that comes from the sun (light or heat).

Solar energy can be used in two ways

1. **Solar thermal energy** is when we use the **sun's energy to heat** our houses, green houses, buildings and heat the water in our homes, buildings and pools.
2. **Photovoltaics** (Photo = light, voltaic = electricity) is when the **light from the sun is turned directly into electricity** using solar panels. These systems are used to power things calculators as well as things in homes and buildings.

Solar panels only generate electricity when the sun is shining, so people attach them to batteries so that the electricity is stored ready to be used at night or when the sun is behind the clouds.

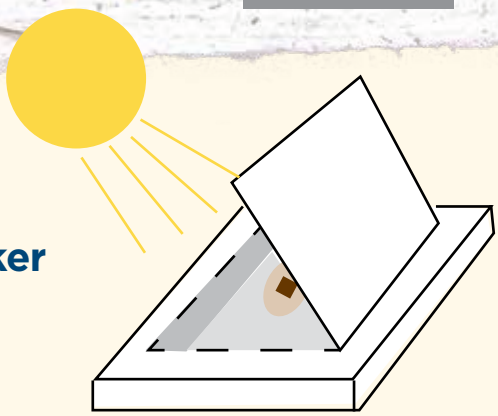


What heats up your car when it's parked in the sun with the windows closed?

What makes your solar calculator go?

What makes the clouds that make the rain?

SOLAR ENERGY!



ACTIVITY: Make A Solar Cooker

You will need:

- A pizza box (a 12" square box works well)
- Tape
- Aluminium foil
- A pair of scissors
- An ice-block stick
- A piece of transparent plastic
- A piece of black paper the same size as the base of the pizza box.
- Plain biscuit and piece of chocolate

What to do:

1. Cut a flap in the lid of the pizza box. *Cut three sides about 3cms in from the edge and fold back the 4th side at the back to form the flap.*
2. Cut a piece of aluminium foil to cover the inside of the flap and tape it in place.
3. Place the black paper inside on the base of the pizza box.
4. Cut a piece of transparent plastic to fit the hole under the flap in the lid. Tape the plastic in place on the inside of the lid.
5. Place the biscuit with the chocolate on top of it inside the solar cooker.
6. Find a sunny spot and angle the foil of the lid flap to best concentrate the solar heat energy. Use the iceblock stick to keep the flap at the best angle.
7. Spread the melted chocolate over the biscuit.

Try insulating the solar cooker by rolling up newspaper and taping it around the outside of the box. Stand the cooker on a few pieces of folded newspaper. Does it make a difference?

Sourced from Bay of Plenty Regional Council's 'Energy Resource'

Using energy efficiently

Using only what is needed and not wasting energy.

We use energy all the time – at home, school, when we are playing and at work. If we use energy wisely we are helping to save the Earth's energy resources (like coal, oil, natural gas) and save money on bills.

But the best thing about using energy wisely is that we can help the environment by cutting down on air and water pollutants!

DID YOU KNOW?

about 1/2 About half of the energy used in homes is for heating.

About 20 percent of the electricity in the country is used to keep the lights on

It uses about the same amount of energy to produce one aluminium can from scratch as it does to produce nearly four cans using recycled aluminium – always recycle!

COMPETITION! Using energy efficiently quiz!

Which of these should you do to save energy at home?

1 ***When you are the last person to leave a room you should...***
- A leave the light on for the next person who comes in
- B switch the light off

2 ***Which uses less hot water?***
- A shower
- B bath

3 ***When you finish using your computer or television for the day, you should...***
- A leave it on and running
- B turn it on to standby
- C turn if off at the wall

4 ***When you make a hot drink should you...***
- A fill the jug from the hot tap
- B fill the jug from the cold tap
- C put in only as much hot water as you need
- D put in only as much cold water as you need

5 ***When is a good time to close the curtains?***
- A When it is dark
- B When it is cold in the room
- C When the sun starts to go down

6 ***When you have some clothes to wash, should you...***
- A wash when you have a full load
- B wash whenever you feel like it
- C wash when you have a half load

Send your answers to BuzzBOP by post or email buzzbop@boprc.govt.nz – remember to include your name, age and address!

Winter energy efficiency tips!

A dry home is easier and more efficient to heat, and is better for your health too!

COLOUR IN!

Insulate yourself first!

Put on an extra layer of clothing, hat and slippers before lighting a fire or turning on a heater.

Insulate

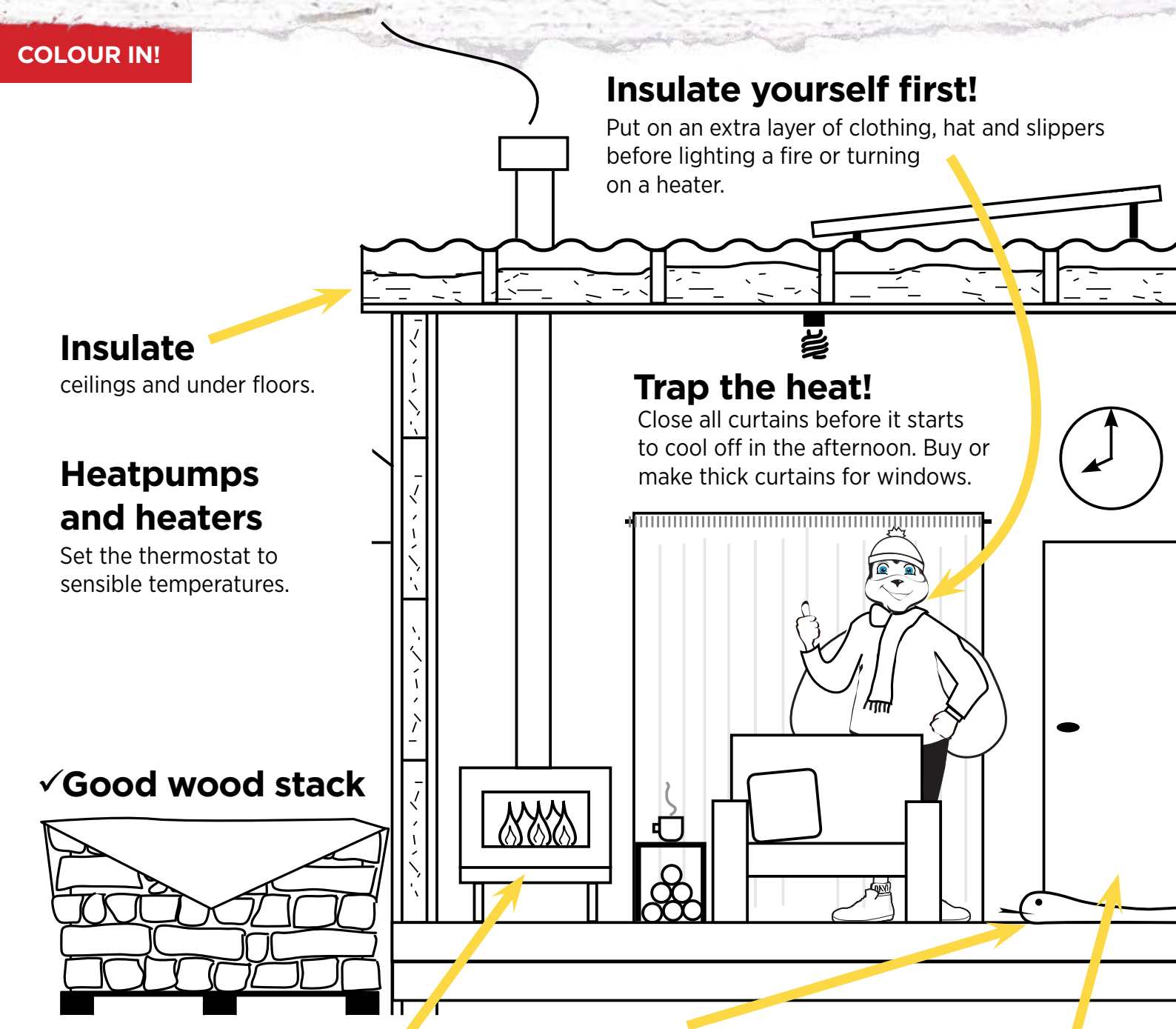
ceilings and under floors.

Trap the heat!

Close all curtains before it starts to cool off in the afternoon. Buy or make thick curtains for windows.

Heatpumps and heaters

Set the thermostat to sensible temperatures.



✓Good wood stack

Only burn clean, dry wood.

If you have a wood burner, make sure your firewood is dry – it burns better and produces less smoke.

Block out draughts

around doors and windows (you can use door snakes, draught stoppers or draught stopping tape).

Shut the doors

- only heat the areas you're using, and only while you're using them.

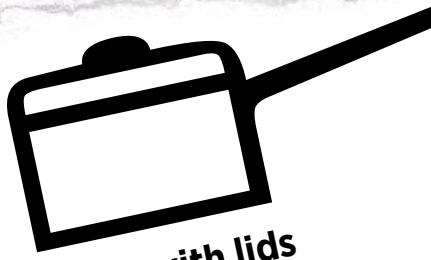
Check out ***PBC newsletter 58 –Sustainable Actions*** for the cleaner burning good wood checklist and instructions to make a draught stopper.

Energy saving tips!

Save energy - Save money

OUR FAMILY TIPS:

Energy saving
lightbulbs
Use energy saving fluorescent lights in place of incandescent lights ... and turn off the lights when you leave the room!



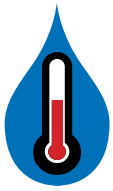
Cook with lids
on pots and pans to keep the heat from escaping

Recycle
paper plastic, aluminium and glass

Fix leaking taps every drop counts!

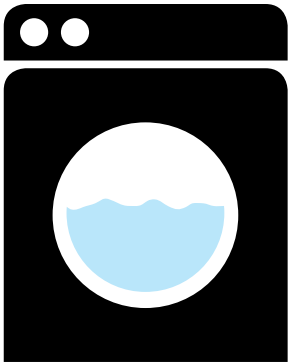
Use green transport!
If you only need to travel a short distance walk, scooter or bike instead of taking the car... or catch a bus

Turn appliances off
at the wall - don't leave them on standby



Is your water too hot?
Ask an adult to turn the hotwater thermostat to 60 degrees and **Insulate** your hot water cylinder

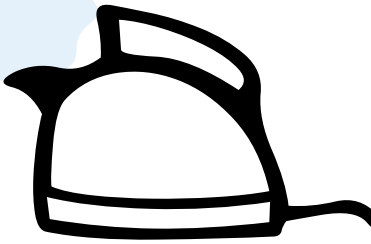
Wash full loads
of clothes and use
cold water



Have a SHOWER instead of a BATH

Use the line (**wind** and **sun!**)
instead of a dryer

Only boil as much as you need



Stick this on your fridge and add other tips to it!

BuzzBOP'S friend Brydie Such

What do you do?

I am a Customer Services Officer in the Whakatāne Office. I work in reception and do administration work for Human Resources and Pollution Busters.

What is the best part of your job?

Getting to meet and talk to members of the public and staff members and help them with their queries.

What do you do to save energy around the house?

I use energy efficient light bulbs and make sure lights are turned off when no one is in the room. I also turn off and unplug devices and appliances that aren't being used.

What is your message to Pollution Busters?

There are lots of different ways to save energy, if everyone saves a bit extra it will really add up.

REMEMBER:

You need lots of long lasting energy so you can work and play and keep on pollution busting. Make sure you eat healthy food, drink plenty of water and get lots of sleep so your body has energy!

Have a fantastic holiday Pollution Busters!

POLLUTION BUSTERS CLUB

Post to:

BuzzBOP and Team
Bay of Plenty Regional Council
Freepost 122076
PO Box 364
Whakatāne 3158

Email:
buzzbop@boprc.govt.nz

Do you have friends or family aged 3-15 years old and live in the Bay of Plenty?

Are they interested in learning about the environment and sustainability?

Get them to join the Pollution Busters Club by sending BuzzBOP the following:

Name, address, phone number, birthday and school.