

A teaching resource for introducing the topic of energy

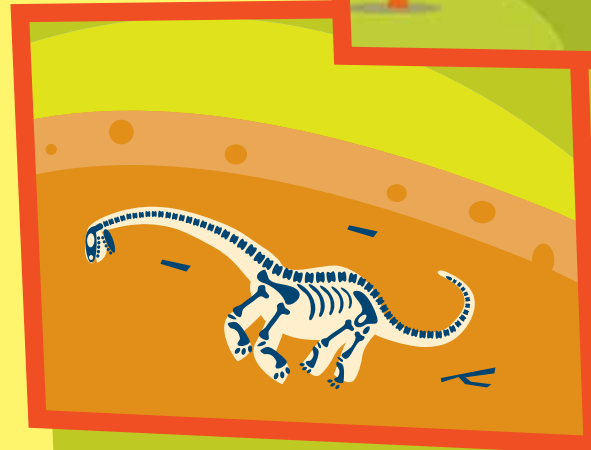
THE STORY OF ENERGY AND CLIMATE CHANGE

The energy we all use comes from fossil fuels such as gas, oil, peat, coal and petrol.

The story of energy begins a long, long time ago. Millions of years ago energy from the sun was absorbed by plants, some of which were eaten by animals. When the animals and plants died, they were covered with mud and waste and became part of the earth's crust. For millions of years they were squeezed together and heated from the centre of the earth until they turned into the fossil fuels that we use today.

We use the energy stored in these fossil fuels everyday in our homes. We turn some of the fuels into electricity to light rooms and to heat water. A lot of appliances in our homes need electricity to work.

Electricity is a great resource which powers much of our lives. It is used in every house, in every street, in every village, town and city in the country.



We've come a long way since the dinosaurs. Everywhere you look you can see fossil fuels being used. We use them to heat our homes and to move us about on the road, rail and in the air. When we burn fossil fuels, we release the energy inside them that was soaked up from the sun millions of years ago.

If you follow the power lines from your home all the way back, you eventually come to the power station providing your energy supply. It is here that burning fuels allows us to make steam in a boiler, which in turn, drives a generator to produce your electricity.

But burning all these fossil fuels for heat, electricity and transport also creates a gas called carbon dioxide (CO_2). Carbon dioxide is a gas which stays inside the earth's atmosphere. It allows the sun's rays in, but doesn't let the heat out.

The more fossil fuels we burn, the more carbon dioxide we produce to trap the sun's heat. This warming of the atmosphere is causing our climate to change faster than it ever has before.

We need to look at smarter ways to use energy and also to seek alternatives to fossil fuels.



CLIMATE CHANGE QUIZ



What is climate change?



A climate change is a change in the normal weather patterns across the whole world. One part of the world might begin to get unusually cold winters whilst others might start having uncommonly hot summers. It might start to rain a lot in one place while, in another part of the world, it might stop raining altogether.

Climate change usually takes hundreds of millions of years to happen.

The climate change that we are seeing now is happening really quickly.





What happens when there is a very quick climate change?



The weather all over the world gets more extreme. Not only will a place become hotter or colder than usual, but it may also get extremes of weather such as floods, droughts, high winds and/or heavy rain.

When climate change happens over a short period of time the world's creatures and plants have not got enough time to move home or to get used to the new conditions. This can cause many types of animals and plants to die.





How can the energy we use affect the world's climate?



Most of the energy we use comes from burning fossil fuels. We started doing this about 200 years ago. Burning fossil fuels releases gases into the atmosphere. One of these gases is carbon dioxide (CO_2). It is called a greenhouse gas because it stays around the world and stops the sun's heat from escaping, just like the glass does in a greenhouse.

For as long as we keep burning more fossil fuels to make our energy, more and more heat is being trapped and our climate will change even faster.





Why do we use energy?



Energy keeps us warm and makes our lights work. It makes our machines work too and moves our vehicles. We use energy for nearly everything and we use it all the time. Some things have to be left on all the time, like the freezer or street traffic lights, but we also use energy that we don't need.

Sometimes we leave lights on in empty rooms or leave appliances like TVs on standby all night. If we can all remember not to use energy that we don't need then we can make a big difference to the amount of energy that is used.



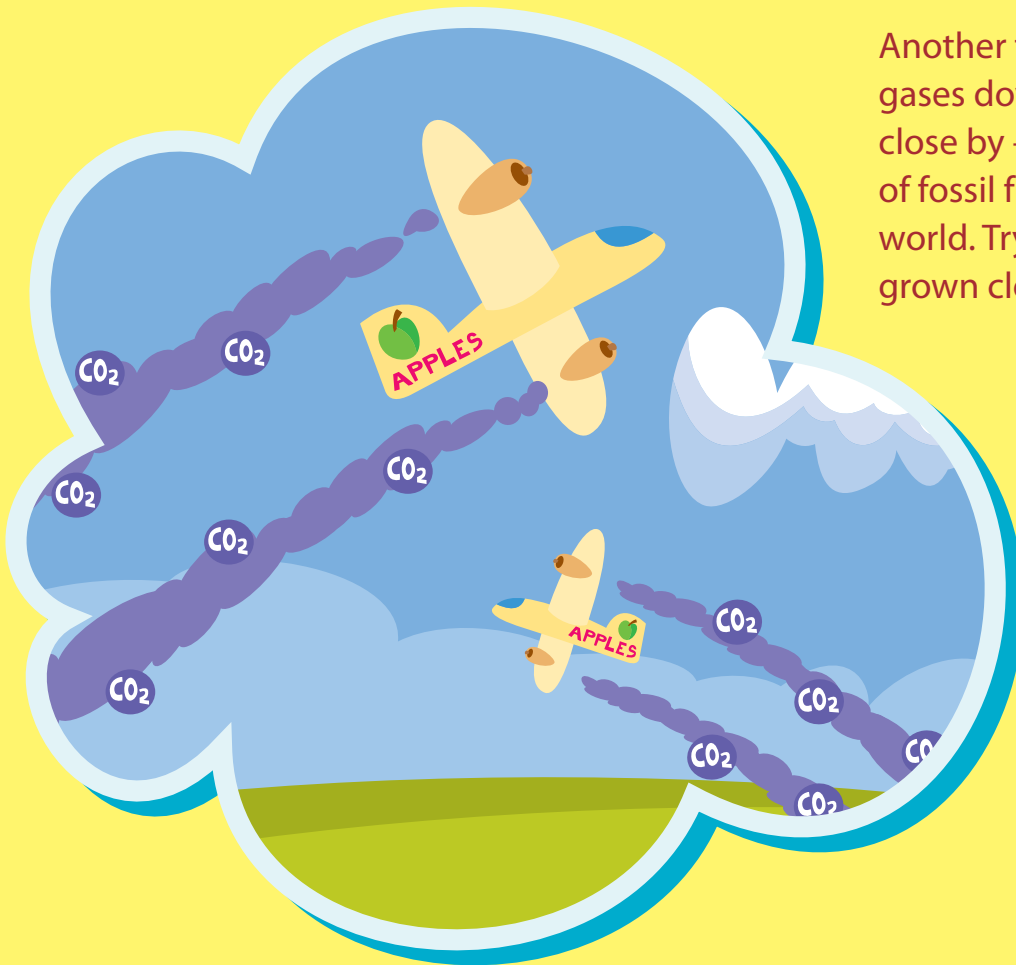


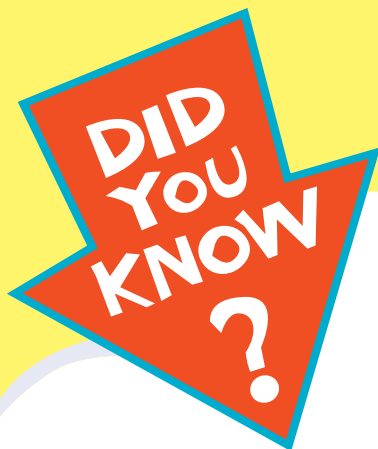
How does transport use energy?



Most vehicles use fossil fuels as their energy source so they make the greenhouse gases worse. Walking or taking a bus or train whenever you can will help to keep greenhouse gases down.

Another thing that will help to keep the greenhouse gases down is to buy food and goods that are made close by – the closer the better. Enormous amounts of fossil fuels are burnt to transport items across the world. Try to make sure that your goods are made or grown close to home.





- In Ireland we use more than twice as many cars as we did just 10 years ago!
- We have some of the best places for making wind and wave energy in the whole world.
- At the moment we buy 90% of our energy from other countries!
- Ireland has a perfect climate for growing biomass crops.
- We can save huge amounts of greenhouse gasses by not using much electricity between 5pm and 7pm.

SAVING ENERGY AT HOME

It is possible to save a lot of energy by making sure that it is only used when we need it.

Light

To use lights only when we need them, we need to make sure that our curtains are not keeping light out of our houses and that we switch off lights when we are not in the room.

Heat

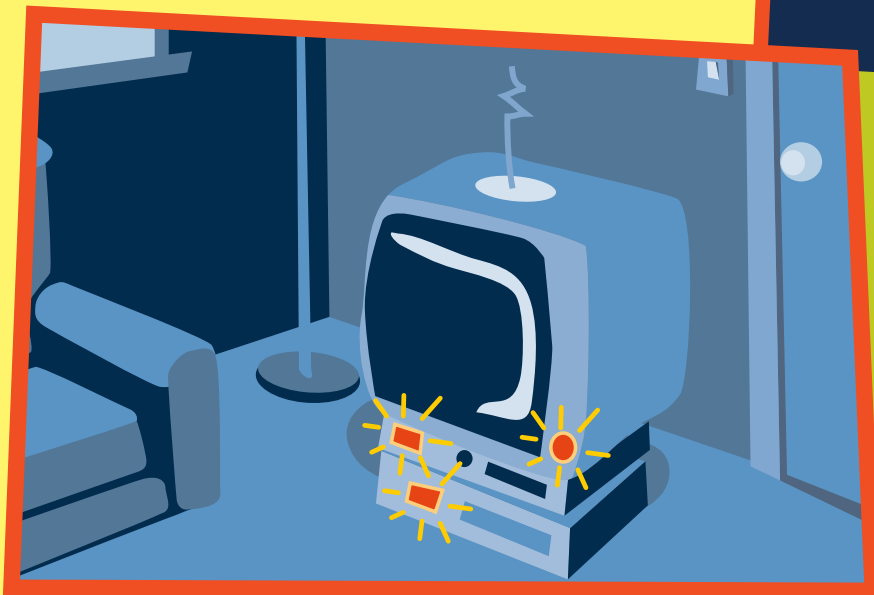
We can save the most energy by saving heat. Switching off radiators in empty rooms will help with this, as will keeping doors closed and putting on a jumper if we get cold.



Switch appliances off standby

Appliances left on standby still use energy; it isn't until they are switched off completely that they stop.

Look around your home at night and you may see little lights on many of the machines that you own. If you see lights on your machines, switch them off. You are becoming energy efficient already!



Test yourself with our online energy game, go to www.seai.ie/schools/energy_game/

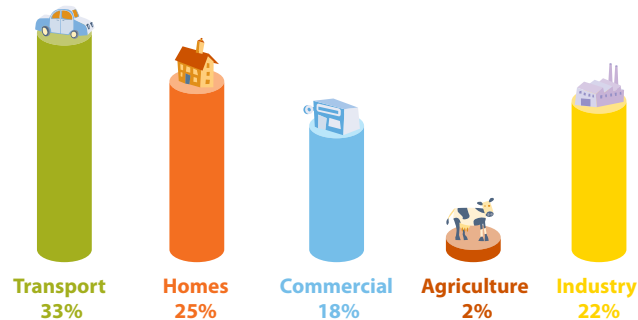
TOP TIPS TO SAVE ENERGY

- Don't leave appliances on standby – turn them off, appliances on standby are still using electrical energy.
- Walk or cycle whenever you can, it saves transport energy and keeps you fit.
- Ask if the heating can be turned down, just turning it down by 1 degree will save loads of heating energy.
- Re-use things where you can and then recycle them. It will save the energy used in making things and transporting them.
- Encourage people to change to energy efficient light bulbs, they use 1/5 of the electrical energy and last up to 10 times as long!
- Keep heat from escaping by closing windows and doors when the heating is on.

- Buy Irish and local goods where you can, it saves transport energy and creates less pollution.
- Find out who in your school lives near you, you could save energy by sharing a car to get to school.

Who uses Ireland's energy?

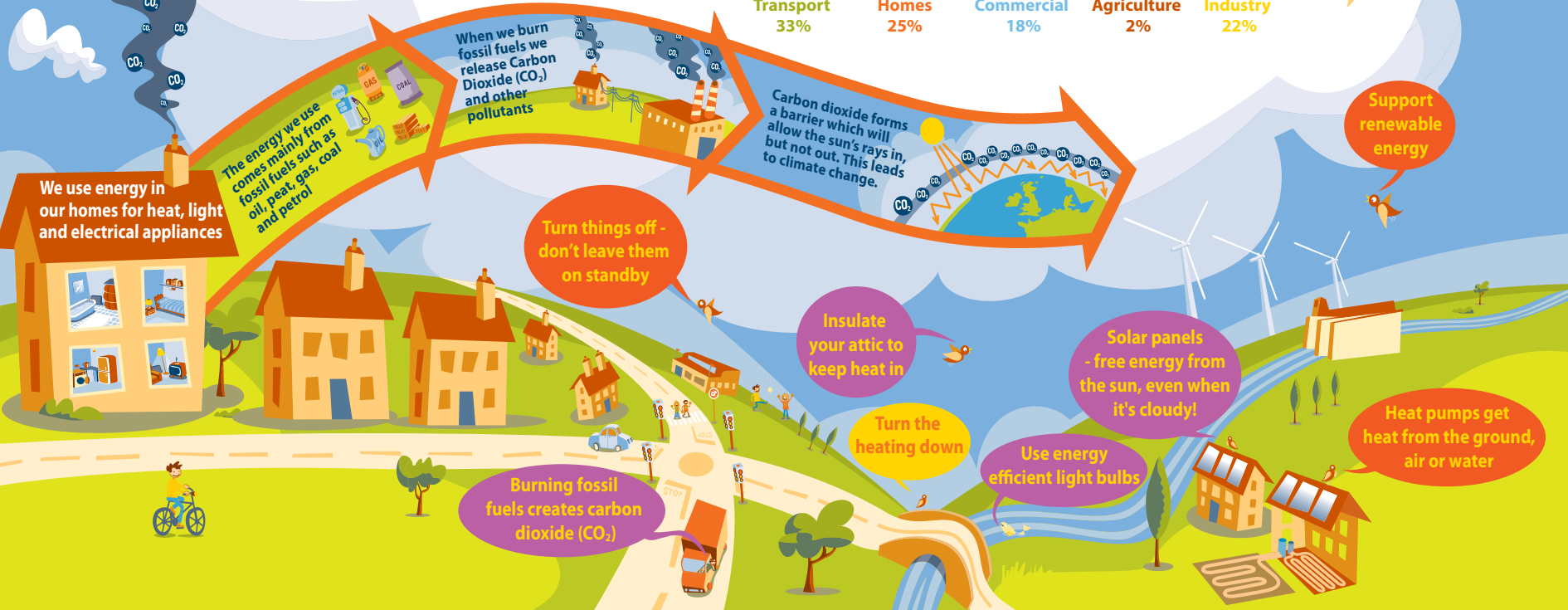
This shows the percentages of CO₂ made from energy



Ireland is one of the windiest places in Europe

Ireland could get more of its energy from renewables

Support renewable energy





GOING
A STEP
FURTHER

Renewable energy

We get most of our energy today by burning fossil fuels. Burning fossil fuels releases harmful greenhouse gases and our supply of fossil fuels is going to run out.

Fossil fuels were made millions of years ago and we can't make any more. However there are other energy sources that we can use to make our electricity, power our vehicles and heat our homes. These sources of energy do not release greenhouse gases and they are called 'renewable' sources of energy which means they will never run out.

Most of these renewable energy sources need the sun to work. The sun helps plants to grow, it causes air to heat up and cool down which makes the wind and the rain. The sun is a never-ending supply of energy.

We need to start using more of the renewable sources of energy and less fossil fuels. If we do this it will lessen our contribution to climate change and to ensure that we have power in the future.

The main sources of renewable energy are ...

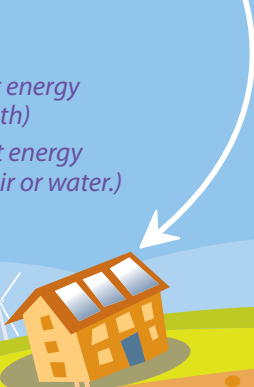
The Wind

Wind power (electrical energy from the wind)



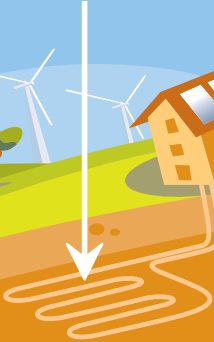
The Sun

Solar PV (electrical energy from the light of the sun)
Solar thermal (heat energy from the heat of the sun)



The Earth

Geothermal (heat energy from inside the earth)
Heat pumps (heat energy from the ground, air or water.)



Crops

Biomass (electrical energy and heat energy from the burning of certain crops – e.g. wood and elephant grass)
Bio fuels (transport energy from some crops – e.g. sugar beet)



Water

Hydropower (electrical energy from falling water)
Tidal power (electrical energy from the movement of the tides)
Wave power (electrical energy from the movement of the waves)



You too can use renewable energy

It is possible to make your own electricity or heat using renewable energy devices in your home. Our website www.seai.ie has more information about how to do this.

It is also possible for your school to make sure that all the electricity it uses has been made using renewable energy sources. To do this, ask your school to go to www.energycustomers.ie and click on “list of electricity suppliers”. There you will find a range of suppliers some of whom sell ‘green’ electricity.