Sustainable Electricity

Heather Rising

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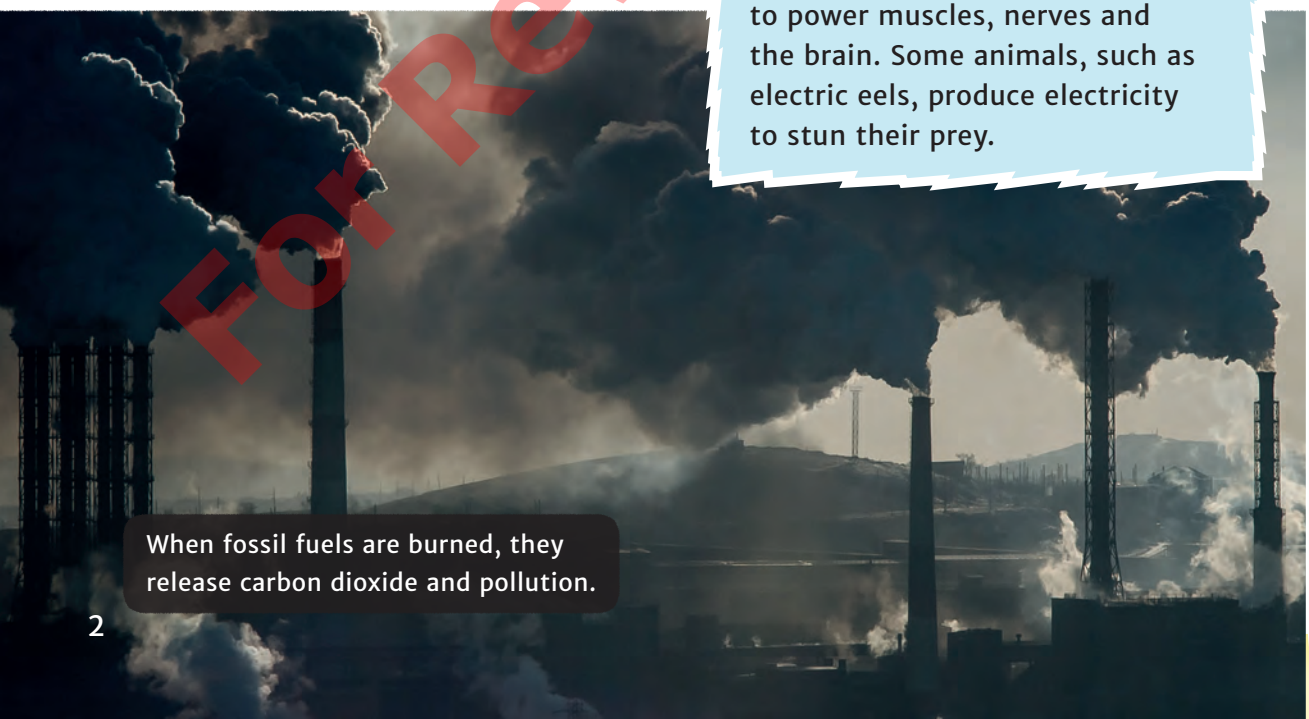
What Is Electricity?

Electricity is a form of energy that is found naturally in lightning bolts and **static charges**. Over 300 years ago, scientists discovered how to make their own electricity, and today, electricity can run machines, cool houses and power lights. Most electricity is made by burning **fossil fuels** such as coal or gas, which releases carbon dioxide into the air and contributes to **climate change**. Once fossil fuels are burned, they are used up, so they are not able to be used again.

Electricity can be found in nature, such as when lightning strikes during a storm.

The human body makes electricity to power muscles, nerves and the brain. Some animals, such as electric eels, produce electricity to stun their prey.



When fossil fuels are burned, they release carbon dioxide and pollution.

Every year, the world's demand for electricity grows. If we make electricity through **sustainable** methods, such as by using wind or solar energy, it will be available far into the future and there will be little harm to the environment.

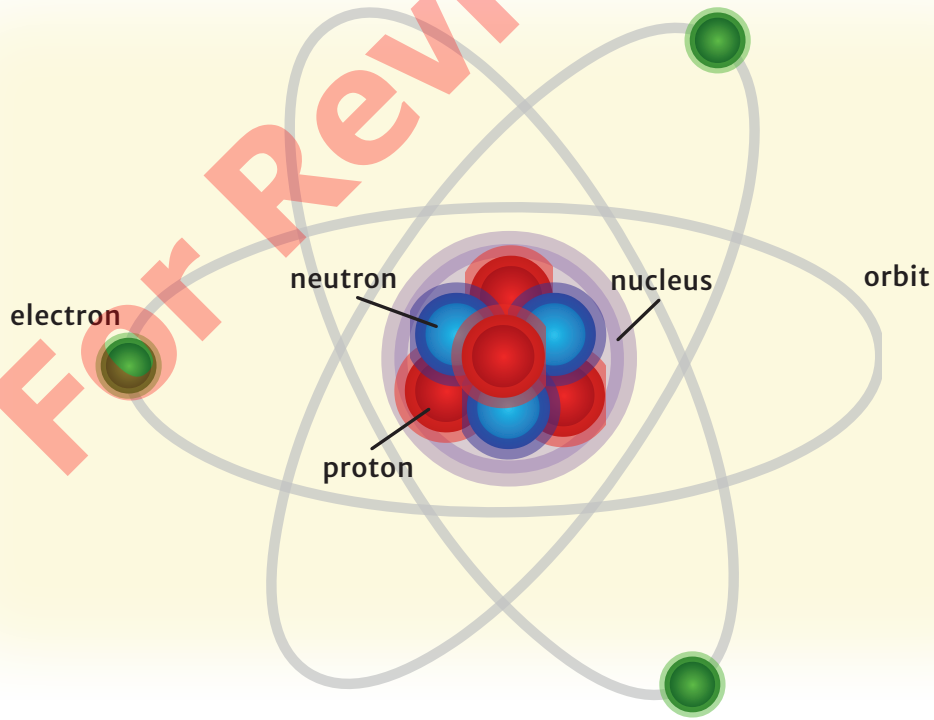
Wind can be used to make electricity without causing significant harm to nature.

Discovering Electricity

The ancient Greeks experimented with making electricity and discovered that by rubbing two materials together, they could create a very small static charge. Static charges can be created at home by actions such as pulling clothes from a dryer or shuffling your socks on a carpet.

In the late 1800s, scientists discovered that electricity was the movement, or flow, of **electrons** between two substances. Electrons are found in atoms, which are the tiny particles that everything in the world is made up of. Scientists learnt they could move electrons by turning magnets around a copper wire. They built a device called a **generator**, which could create a steady movement of electrons.

Parts of an Atom



The flow of electrons along a copper wire creates electricity, or an electric **current**. Electricity flows easily through copper, as well as some other materials, which are called "conductors". Different materials, such as wood, don't allow electricity to flow through them easily. These are called "insulators".

Most electrical wires have copper inside them to help electricity flow easily from one place to another.

Some artists use electricity to make art. Introducing electrical charges to wood creates interesting patterns, because electricity cannot flow well through it.

Making Electricity with Chemicals

Scientists continued to do experiments to find other materials that could move electrons easily. In 1800, a scientist named Alessandro Volta discovered that, in the right conditions, copper and zinc placed in salt water could make an electric current. He then invented a container that made a steady flow of electricity, which could be stored until needed. This container was later called a battery.

Battery design improved over time, and soon batteries could be reset, or recharged. Electricity could flow from them again and again. This meant that batteries could be reused, which made them more affordable. Today, many of our devices are powered by rechargeable batteries.

This model of Alessandro Volta's battery shows how copper and zinc discs were stacked in a container that could be filled with salt water.

Modern batteries, such as this car battery, can be recharged multiple times.

Scientists are continuing to search for ways to improve batteries, with the goal of making a greater amount of electricity that is forever rechargeable. Batteries or other similar containers may be a sustainable way to make electricity in the future.

Many batteries can be linked to create lots of electricity, like this system that acts as a power backup in a factory.

Rechargeable batteries made electrical power affordable and led to the invention of electrical machines. By 1897, electric taxis running on batteries were being driven on roads in the UK and the USA.

an electric taxi in London, England