

## Fossil Fuels



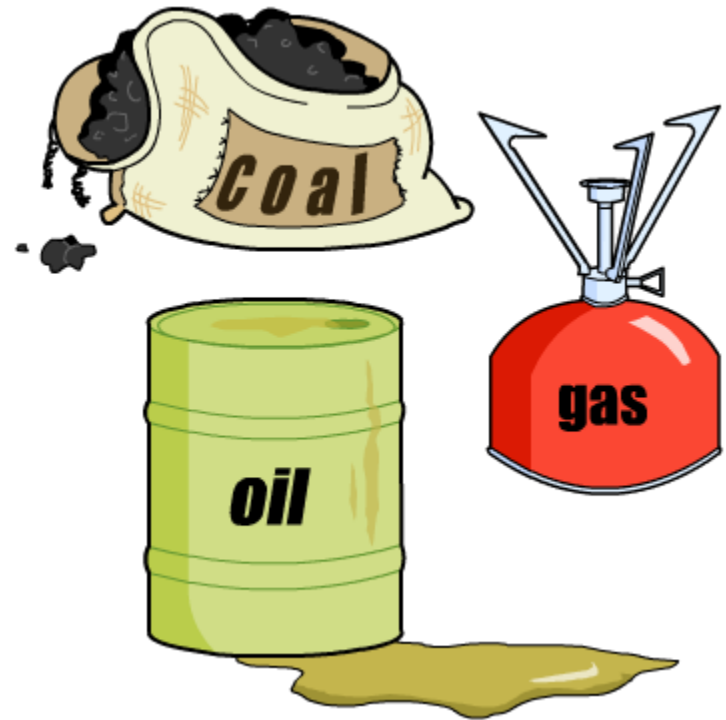
# What are fossil fuels?

Industrial societies need a lot of energy and, at the moment, rely on fossil fuels as the main source of this energy.

Coal, oil and natural gas are fossil fuels. They are carbon-based materials that formed over millions of years from the remains of ancient plants and animals.

Fossil fuels are so useful because they contain stored chemical energy, which is converted into large amounts of useful heat energy when the fuels are burned.

The total amount of fossil fuels available is limited and so they are classed as non-renewable energy resources



# How do fossil fuels produce electricity?

Power stations that are fueled by coal and oil operate on the same basic principle.

The fuel is burned and the heat produced is used to boil water.

This creates high-pressure, superheated steam, which is then used to turn a turbine.

The turbine turns a generator and so generates electricity.



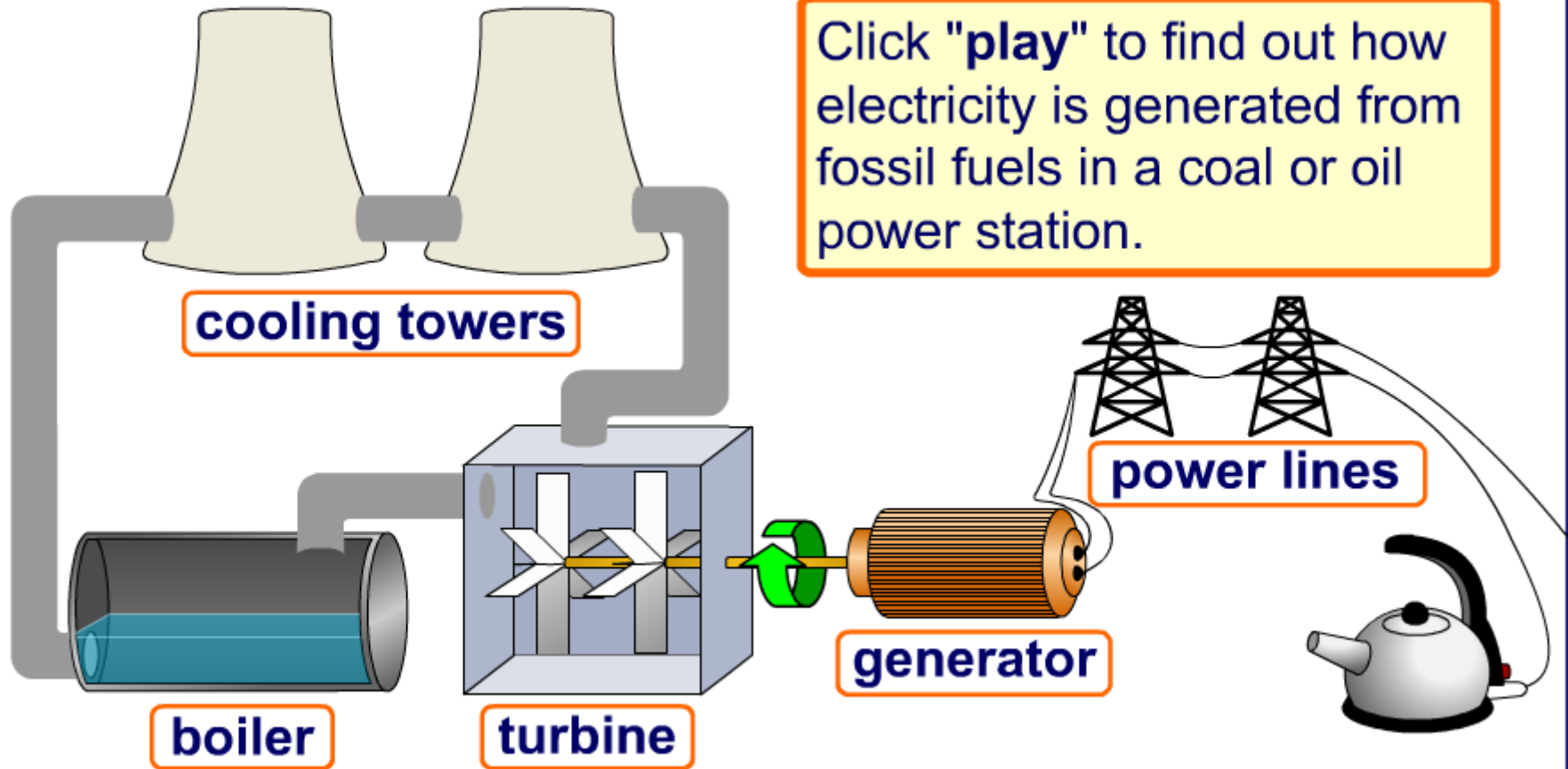
The cooling towers cool the steam, which condenses as water and can then be recycled in the power station.

Natural-gas-fired power stations do not use steam. The natural gas is burned and the hot gases produced are used directly to turn the turbine.





## How does a coal or oil power station work?

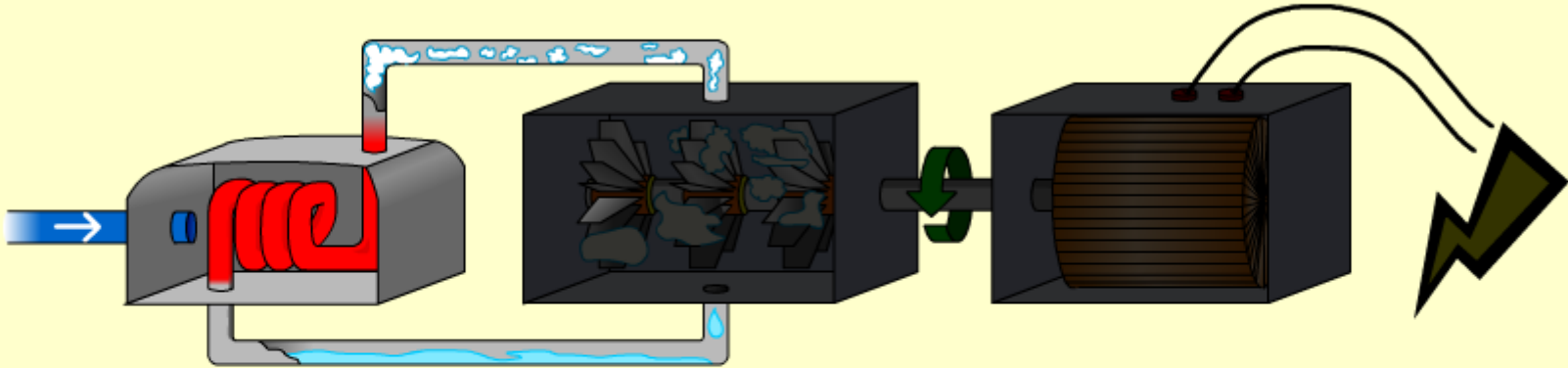


Click "**play**" to find out how electricity is generated from fossil fuels in a coal or oil power station.



## What are the energy changes in a coal or oil power station?

1. **The boiler:** fuel is added and burned to turn water into steam.



Input energy

?



?

Output energy

chemical

kinetic

electrical

heat

?

C

solve

↶

**What is the order of generating electricity from coal?**

- 1 Powdered coal is blown into the furnace.
- 2 The coal burns, heating up water in the boiler.
- 3 The high pressure steam turns the turbine.
- 4 The generator turns and electricity is produced.
- 5 The turbine turns a shaft connected to the generator.
- 6 The water in the boiler becomes high pressure steam.

?

C

solve

↶

# What waste do fossil fuels produce?

Burning fossil fuels creates waste products that can act as pollutants and have harmful environmental effects.

- **Carbon dioxide:** This **greenhouse gas** is the main waste product of burning fossil fuels. Increased levels of carbon dioxide due to human activities are thought to be connected with global warming.
- **Sulfur dioxide and nitric oxides:** These gaseous pollutants contribute to the formation of smog and acid rain.
- **Ash:** This waste solid is disposed of in landfill sites.



What can be done to reduce the problems caused by burning fossil fuels?





# What is the greenhouse effect?



## What is the greenhouse effect?



The greenhouse effect has a major impact on the temperature of Earth.

Click "**play**" to find out how the greenhouse effect works.

