STEM EDUCATION PROGRAMME

Energy

Future of Energy

LO: To understand how to achieve Net Zero together

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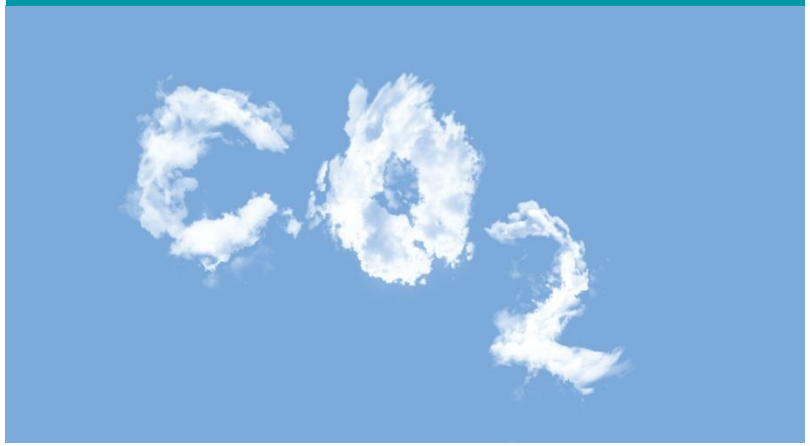
WHO ARE SSE?

Do now:

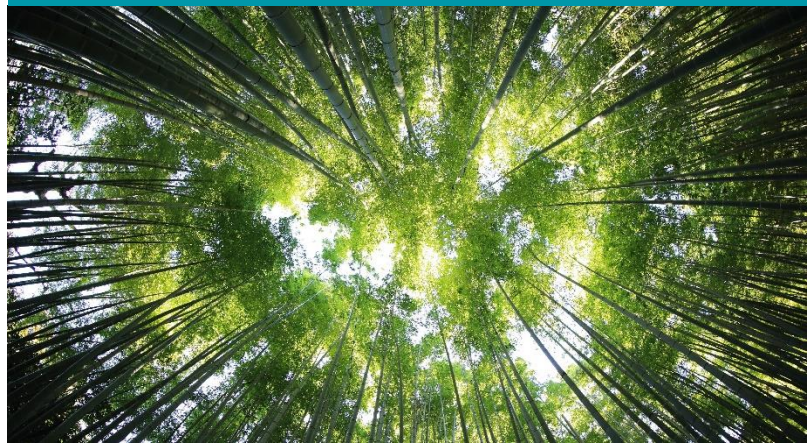
How does this make you feel and why?

KEY WORDS

carbon emissions



decarbonisation



Net Zero

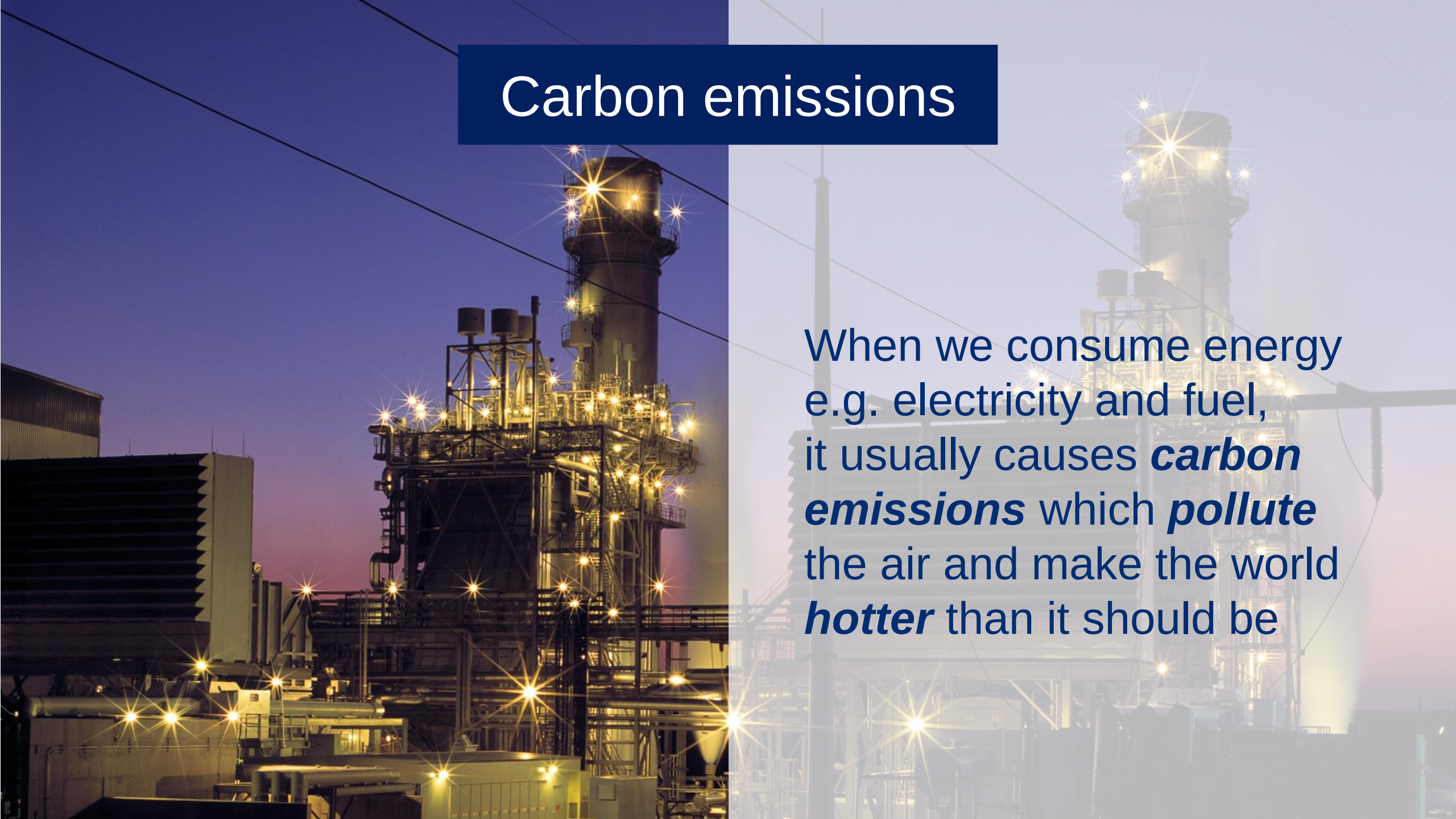
Energy consumption

Energy is an ***essential*** part of our ***daily lives***

We consume it at ***home***, ***school*** and in the wider ***world***

We rely on ***electrical energy*** to power our appliances and ***fuel energy*** to power most of our transport

Carbon emissions

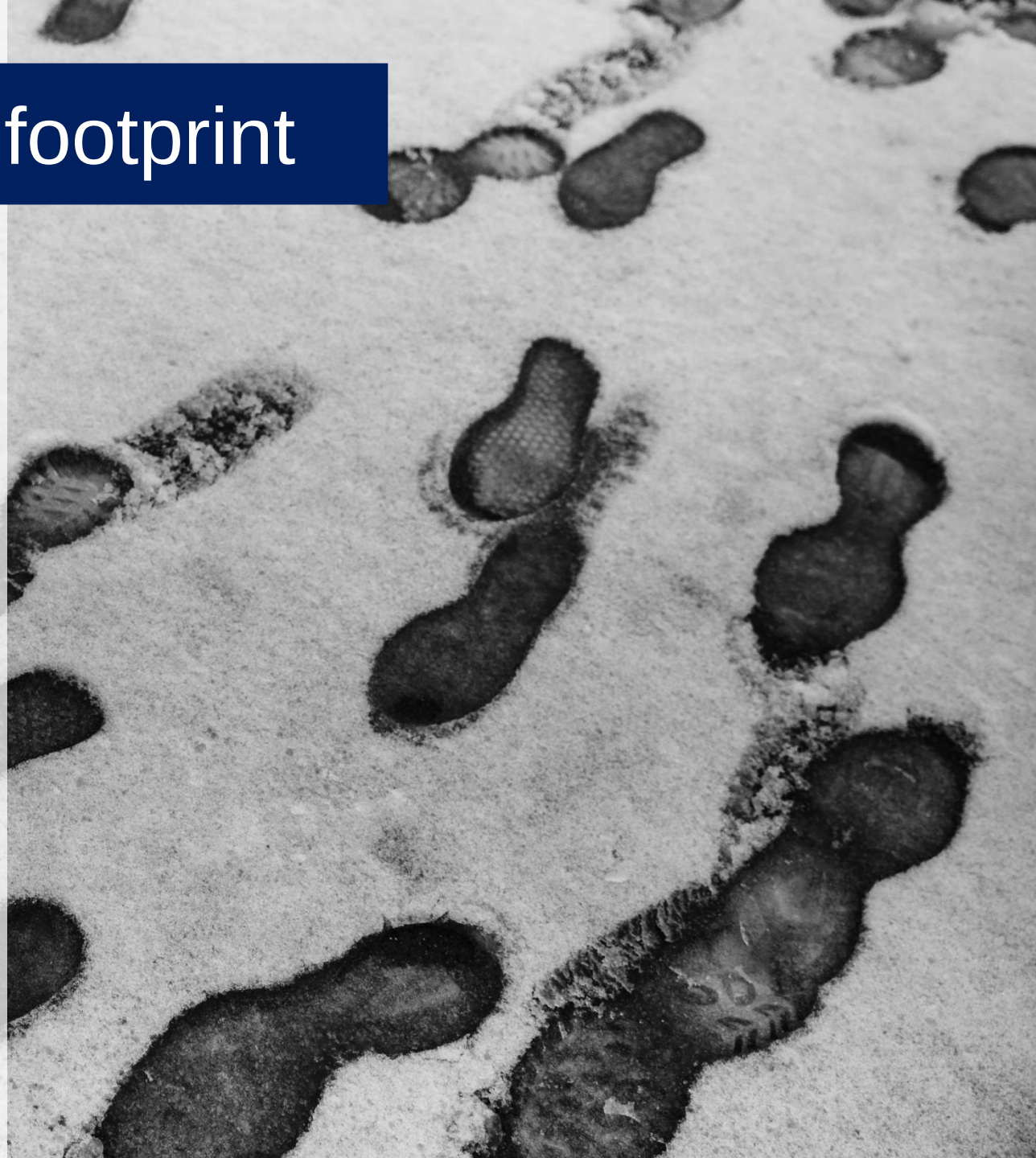


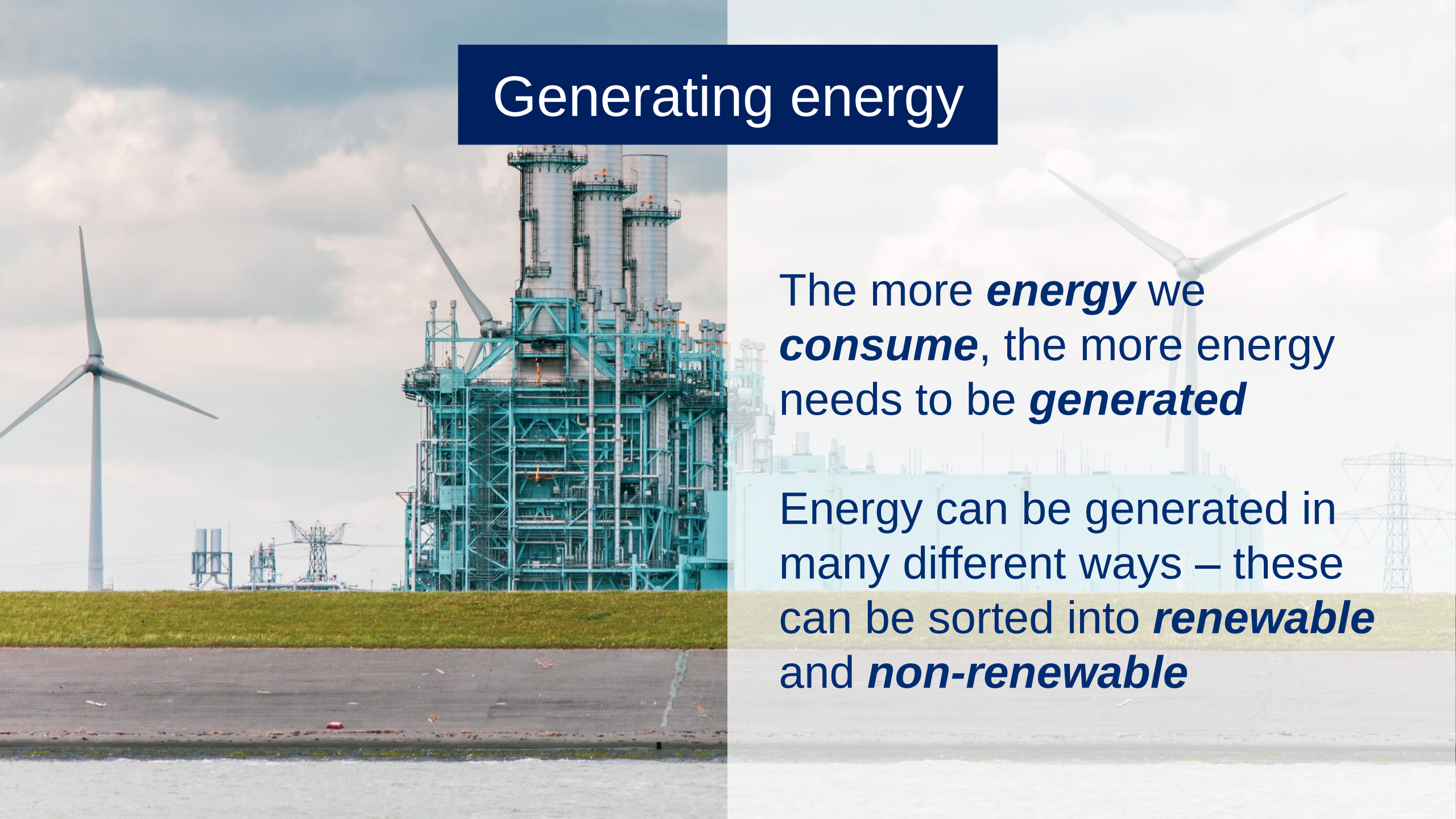
When we consume energy e.g. electricity and fuel, it usually causes ***carbon emissions*** which ***pollute*** the air and make the world ***hotter*** than it should be

Carbon footprint

The amount of ***carbon emissions*** that we cause through our energy consumption is known as our ***carbon footprint***

The ***more energy*** we consume, the ***higher*** our carbon footprint is





Generating energy

The more ***energy*** we ***consume***, the more energy needs to be ***generated***

Energy can be generated in many different ways – these can be sorted into ***renewable*** and ***non-renewable***

Renewable energy sources

Renewable energy sources are ***better*** for the ***environment*** as they do ***not*** cause many ***carbon emissions*** or use the world's ***finite resources***

*These include **wind** energy, **solar** energy and **hydropower***

Non-renewable energy sources

But we still need ***non-renewable*** energy sources like gas and oil to generate enough energy for ***everyone***

However, ***fossil fuels*** involve burning ***finite*** resources which release lots of ***carbon emissions*** into the ***environment***

Powering the world

At the moment, almost ***all*** of the world's ***energy*** comes from ***non-renewable*** energy sources such as ***fossil fuels***

The impact of carbon emissions

Too many ***carbon emissions*** cause ***climate change*** and ***global warming***

Climate change and ***global warming*** involve ***severe weather*** over a matter of years

This ***affects*** all ***living things***, but how?

What is climate change and global warming?

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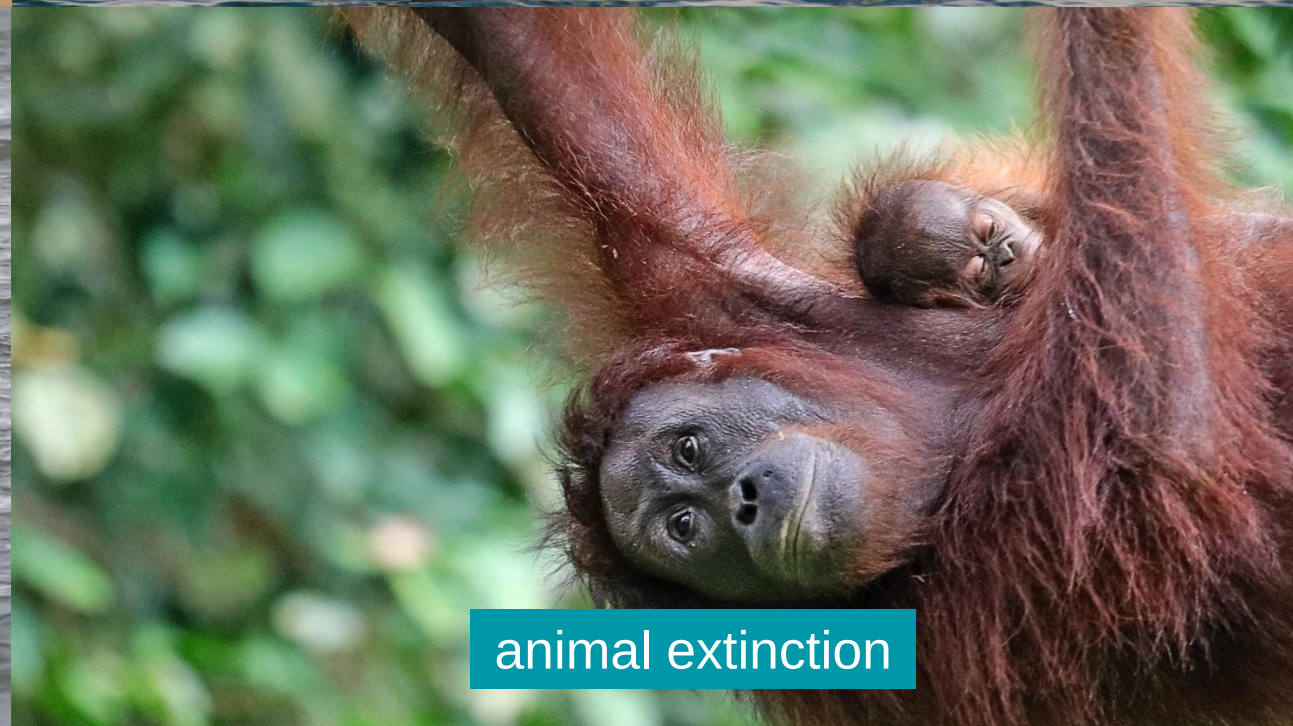

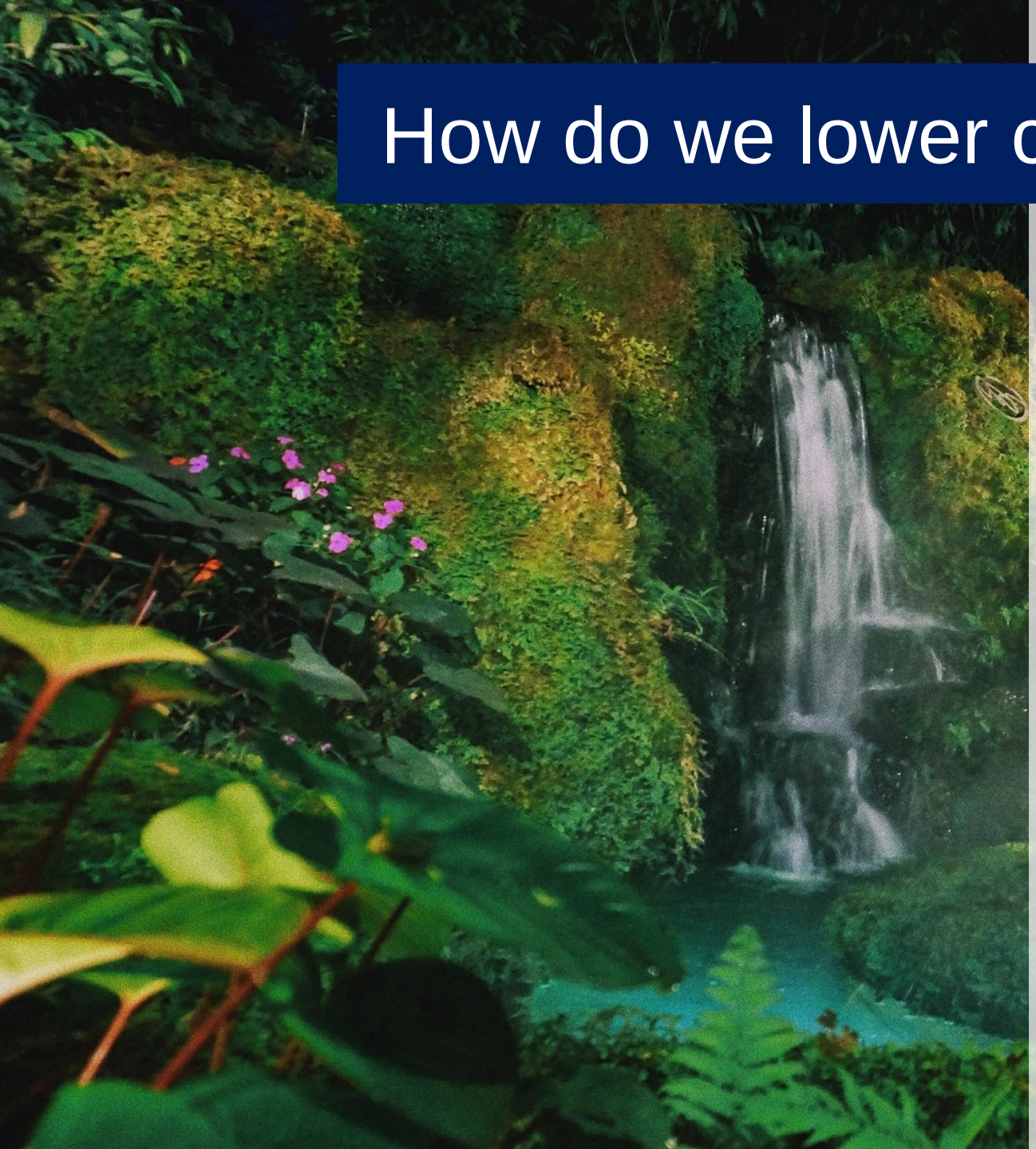

How do we lower carbon emissions?

It is now more important than ever to ***lower*** the amount of carbon in our environment

The main way that carbon is ***removed*** from the air is naturally via the growth of ***plants*** - plants soak up carbon to produce food

The need for trees

The main plants which soak up carbon from the environment are ***trees.***

But we are ***running out****!*

We ***chop down*** trees for all sorts of reasons including to make farmland, wood and paper. It is important we plant more trees and are not wasteful with paper products!

Decarbonisation

This process of ***carbon*** being ***removed*** from the environment e.g. trees is called ***decarbonisation***

But ***how else*** can the world be decarbonised?

New technology

Scientists and engineers are always searching for ways to ***reduce carbon emissions***

We can now ***prevent*** non-renewable power stations from ***releasing carbon*** into the air using new technology

Carbon capture plant

A ***carbon capture plant*** can ***catch*** the ***carbon emissions*** from burning ***fossil fuels*** and ***store*** them underground!

SSE have just planned Scotland's first power station with a ***carbon capture plant*** to help ***decarbonise*** the ***environment***

How does a carbon capture plant work?

What can you do?

There are many things ***we*** can do to help decarbonise the environment

Technology in our homes

We are now using ***technology*** in our homes to ***manage*** our ***energy consumption.***

People have developed ***devices*** which allow ***more control*** over how much energy we use e.g. ***electricity*** for our appliances and ***gas*** for heating

Achieving Net Zero

Once the same amount of ***carbon emissions*** which are ***released*** into the environment are ***removed***, we have achieved ***Net Zero***

Net Zero is when the ***carbon emissions*** in the environment are ***no longer harmful*** to living things

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Main activity:

Balancing the Carbon Cycle

Balancing the Carbon Cycle

Carbon Footprint

Decarbonisation

NET ZERO

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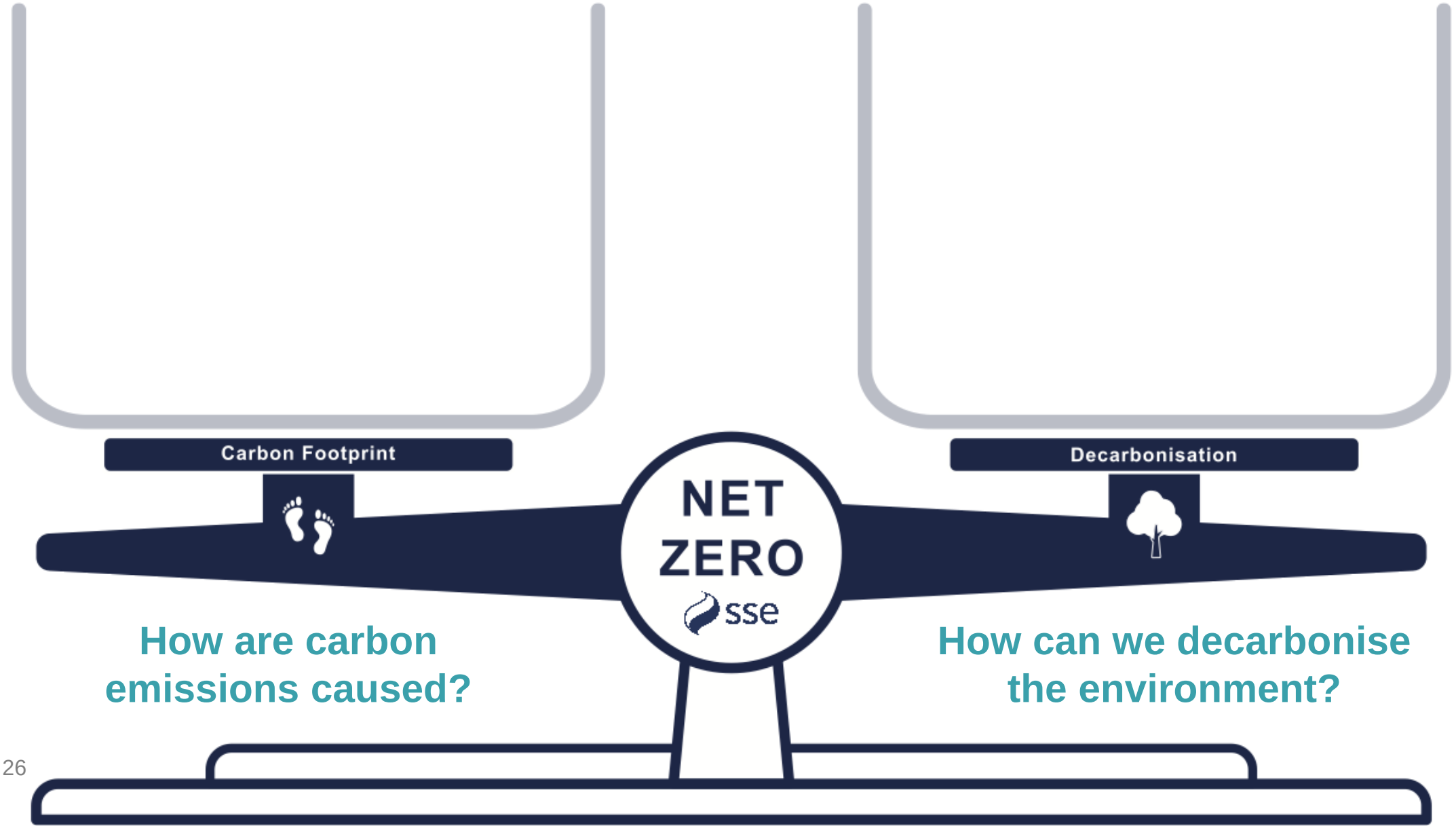
How are carbon emissions caused?

How can we decarbonise the environment?

Balancing the Carbon Cycle



How are carbon emissions caused?

How can we decarbonise the environment?

Which essential skill are we developing?

PROBLEM SOLVING

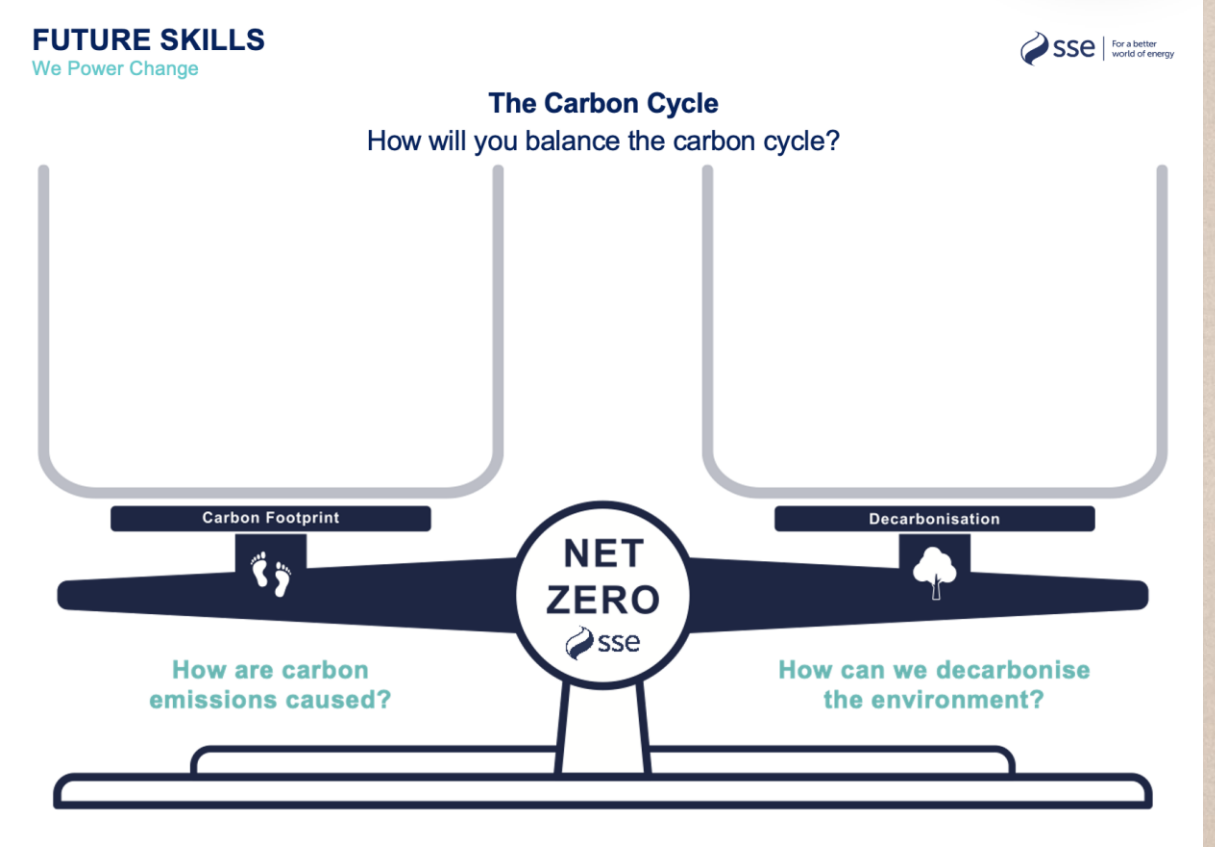
The ability to find a solution to a situation or challenge

STEP 5

I explore problems by thinking about the pros and cons of possible solutions

Main activity:

1. Draw and label things which cause carbon emissions on the left
2. Draw and label things we can do to decarbonise the environment on the right



Presentations

- 'To save energy, we can...'
- 'To help decarbonise the planet, we can...'
- 'To balance the carbon cycle, we can...'
- 'To achieve Net Zero, we can...'
- 'To be carbon-negative, we can...'

How can we balance the carbon cycle to achieve net zero?

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How have we used our Problem Solving skills?

- What is a pro?
- What is a con?
- How can pros and cons be helpful when thinking about a potential solution?
- What pros and cons did you think of to a solution you placed on your right-hand scale?

Glossary

Air pollution – when harmful gasses such as carbon dioxide are released into the air
Carbon capture plant – machines that can prevent carbon emissions and store them underground
Carbon emissions – harmful gasses that are released into the environment mostly from burning fossil fuels
Carbon footprint – the amount of carbon emissions caused through our energy consumption
Consumption – using energy to do different things e.g. exercise, cook, travel, use devices e.g. a tablet
Climate change – when carbon emissions cause severe weather that threat all living things
Decarbonisation – the process of removing carbon emissions from the environment
Energy – what gives people, animals, appliances the power to function
Finite resources – natural resources which do not naturally replenish and will run out
Fossil fuels – finite resources that are burnt to generate energy
Global warming – when carbon emissions cause rising temperatures
Net Zero – When we have removed the same amount of carbon which has been emitted
Non-renewable – when energy is generated from finite resources which run out
Renewable – when energy is generated from resources that do not run out e.g. the Sun

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Activity	Time Allocation Guide
Do Now	5 mins
Introduction to the climate change	20 mins
Provide Model: Carbon Cycle	10 mins
Pupil Practise: Carbon Cycle	15 mins
Review of Learning: Something	10 mins

HOST FEEDBACK

Host Feedback

Can you create a persuasive poster featuring your top tips for saving energy?

Please share your work with us on social media using our hashtag **#STEMatSSE**

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Contact us at ***stem@sse.com*** to request a volunteer from SSE to deliver the lesson

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