

Education – Northern Gas Networks

Supporting schools and education facilities in the delivery of sessions linking to Net Zero, climate change, sustainability, and industry.

About Us:

At Northern Gas Networks, we deliver gas to keep homes warm and provide energy for cooking and industry.

We transport gas to 2.7 million customers in the North of England through 37,000km of pipes, that's enough pipes to stretch from Leeds to Sydney and back again! We maintain and upgrade our pipe network and respond to gas emergencies to keep everyone safe.

As well as providing energy today, we're busy planning for a greener future. We know the gas we use is contributing to climate change because it produces carbon dioxide when burned, so we're exploring opportunities to deliver more sustainable forms of energy.

What we can offer your school:

We know our young people care passionately about the environment and want to help them understand the

All of our sessions have been developed with the current curriculum and exam board specifications in mind, to ensure that they are relatable to your own school objectives.

- Deliver workshops to discuss Net Zero, sustainability and topics around climate change.
- Tailored sessions for classes, organised groups, and year groups.
- Support in delivering careers events you hold in school.
- Speak in and deliver assemblies around Net Zero, sector specific careers and apprenticeships.
- Staff CPD opportunities to provide you with up-to-date industry information which could support delivery of in school sessions and links to industry with your students.

effect of climate change. We run fun, **free** learning sessions which are interactive and engaging and can be delivered through assemblies, lessons, presentations, or a full day of activities.

Alongside opportunities for your students, we can also offer staff CPD sessions to provide you with up-to-date information about the gas industry.

Meet the team!

All our team are recognised STEM Learning Ambassadors, have undertaken Advanced Safeguarding training and have Enhanced DBS Certificates. The team are super enthusiastic about delivering fun and engaging sessions about Net Zero and helping to spread awareness about the challenges we face, and possible solutions.



Dave



Alex



Becs

If you would like to find out more, please contact us at efeducation@northerngas.co.uk and one of the team will be in touch!

We have detailed our sessions in the following resource table, but we can work with you to develop a bespoke session to meet your needs, and the needs of your students. We can discuss the length of your session, the best format for your requirements and are happy to explain how our resources fit with your school curriculum or exam specifications.

Our sessions can be adapted for SEND students, just let us know in your enquiry.

For more information or to book a session please contact us at: efeducation@northerngas.co.uk

Secondary Schools

Resource name	Description
Energy Island	Introduction to Net Zero, greenhouse gases, climate change, Renewable and non-renewable resources- advantages and disadvantages. Pupils develop their own island to try and achieve Net Zero for energy production. Can be tailored to fit with available time.
Atmosphere and Climate Change	Covers the evolution of the atmosphere from the Earth's creation to now. The greenhouse effect and climate change are covered and leads to discussions around Net Zero. Simple experiment to demonstrate the impact carbon dioxide plays on global warming.
Carbon Cycle and Renewables	A game-based introduction to the carbon cycle. Then highlight the problems of energy production (burning fossil fuels) of increasing carbon dioxide. We then look at the greenhouse effect and why we need to reach Net Zero.
Hydrogen cars *New for 24/25*	An interactive and experiment-based session. Experiment that shows firstly how green hydrogen can be produced (electrolysis). Students then work with model cars that are powered using hydrogen in a fuel cell. Net Zero will be explained. The session can be used to show how science works, looking at an investigation to see what affects the running time of the hydrogen cars. We can also look at advantages and disadvantages of fuel cells. This session can be altered to meet time/needs.
Net Zero Quiz	A quiz that covers Net Zero, climate change, greenhouse effect and solving the problem. The quiz is designed to allow discussion and to cover key misconception, leads to new understanding, highlight the importance of Net Zero.

Resource name	Description
Insulation	An interactive and experiment-based session that looks at how insulating homes, and efficiency, are of massive importance for the UK to reach Net Zero, will need access to hot water.
Fuel Cells <i>*New for 24/25*</i>	An interactive and experiment-based session. Experiment that shows firstly how green hydrogen can be produced (electrolysis). Students then work with model cars that are powered using hydrogen in a fuel cell. Net Zero will be explain and they will see how a fuel cells works and the advantages and disadvantages of fuel cells. Fits well with GCSE science looking at fuel cells.
Fossil Fuel vs Renewables <i>*New for 24/25*</i>	An interactive and experiment-based session. Start by looking at Net Zero and climate change, students take a hands-on approach to explore the differences between renewable energy sources and fossil fuels, helping them understand the importance of transitioning to cleaner forms of energy to mitigate climate change and protect the environment. This experiment provides a hands-on way for students to explore the differences between renewable energy sources and fossil fuels, helping them understand the importance of transitioning to cleaner forms of energy to mitigate climate change and protect the environment. This session involves an experiment using candles and renewable resources.
Hydrogen-Production and Distribution	An interactive and experiment-based session. Introduces how “Green hydrogen” can be produced using an electrolysis experiment. Students then will be building their own model gas network which will be tested to see if it functions correctly and meets demand.
Escape Room <i>*New for 24/25*</i>	An interactive session. Using the idea of an escape room. Students are given a box with several different styles of locks etc sealing the box. Students try to solve several problems, (based on Net Zero, climate changes, and future energy). To try and obtain the correct combinations etc for locks to ensure they can open the box. <u>(This session has limited availability, please contact us for dates)</u>
Hydrogen Electrolysis Experiment	An interactive and experiment-based session. This experiment shows how green hydrogen can be produced.
Greenhouse Effect Experiment	An interactive and experiment-based session. Simple experiment to demonstrate the impact carbon dioxide plays on global warming. Works best when there is sunshine, and equipment can be set up in the sun.

Resource name	Description
NGN Energy Futures Team	Presentation (lecture style) of what NGN does and why we do it.
Biogas and Digestors <i>*New for 24/25*</i>	An interactive and experiment-based session. This session looks at biogas, how it's produced and used, and how it can help the UK to reach Net Zero. It will involve an experimental set up (This experiment takes a few days to run, so would be set up when we are in the school but would need to be looked at a few days later by the teachers in the school).
Bond Energies	This shows what happen to molecules during combustion. It allows students to calculate the energy released when different fuel burn. This then links to how some fuels can help the UK reach Net Zero.
Designing a Hydrogen Infrastructure	Design a Hydrogen Infrastructure: Challenge students to design a hydrogen infrastructure for a specific location or community. They plan the production, storage, and distribution of hydrogen, considering factors like demand, supply, and infrastructure requirements.
Dragons Den <i>*New for 24/25*</i>	Students will try to create hypothetical business plans for a new startup or an existing company that aims to operate with Net Zero emissions. Students are challenged to look at factors such as energy sources, supply chain management, waste reduction, and carbon offsetting. This project encourages students to think creatively about sustainable business practices. Students will pitch their Net Zero project ideas to a panel of "dragons".
Net Zero Project	This is a project activity for students to complete. It is very flexible and can be done as an enrichment day, in lessons, or run with a STEM/Eco club. It is led by teachers but could be adapted to involve more independent study. The project will show pupils the importance of Net Zero and trying to reduce the effects of global warming on the planet. We are happy to attend to start the project then return at the end of the project to judge the pupils finding- but can be run as an independent project by the school.
Carbon Capture <i>*New for 24/25*</i>	An interactive and experiment-based session. This session will give a brief overview to carbon capture, how it works, and how it can help the UK to reach Net Zero. It will look at different types of carbon capture, how carbon dioxide is captured transported and stored. This involves three simple experiments to show carbon dioxide generation, transport, and storage.

Post 16 Sessions

Resource name	Description
Energy Island	Introduction to Net Zero, greenhouse gases, climate change, Renewable and non-renewable resources- advantages and disadvantages. Pupils develop their own island to try and achieve Net Zero for energy production. Can be tailored to fit with available time.
Atmosphere and Climate Change	Covers the evolution of the atmosphere from the Earth's creation to now. The greenhouse effect and climate change are covered and leads to discussions around Net Zero.
Carbon Cycle and Renewables	A game-based introduction to the carbon cycle. Then highlight the problems of energy production (burning fossil fuels) of increasing carbon dioxide. We then look at the greenhouse effect and why we need to reach Net Zero.
Hydrogen-Production and Distribution	An interactive and experiment-based session. Introduces how "Green hydrogen" can be produced using an electrolysis experiment. Students then will be building their own model gas network which will be tested to see if it functions correctly and meets demand.
Hydrogen Electrolysis Experiment	An interactive and experiment-based session. This experiment shows how green hydrogen can be produced.
Fuel Cells <i>*New for 24/25*</i>	An interactive and experiment-based session. Experiment that shows firstly how green hydrogen can be produced (electrolysis). Students then work with model cars that are powered using hydrogen in a fuel cell. Net Zero will be explained and they will see how a fuel cell works and the advantages and disadvantages of fuel cells. Fits well with GCSE science looking at Fuel cells.
NGN Energy Futures Team	Presentation (lecture style) of what NGN does and why we do it.
Bond Energies	This shows what happens to molecules during combustion. It allows students to calculate the energy released when different fuels burn. This then links to how some fuels can help the UK reach Net Zero.

Resource name	Description
Designing a Hydrogen Infrastructure	Design a Hydrogen Infrastructure: Challenge students to design a hydrogen infrastructure for a specific location or community. They plan the production, storage, and distribution of hydrogen, considering factors like demand, supply, and infrastructure requirements.
Carbon Footprint	Students look at Net Zero and the greenhouse effect. Students then answers a series of questions to work out a carbon footprint score. This highlights the impacts their own lives have on global warming. The students then look at how they could reduce their own carbon footprint.
Staff CPD	We are happy to deliver sessions to members of staff about the possible projects around future energy and why it is being done. This will allow staff to have informed discussions about Net Zero and possible solutions to it with their students.

Games and Quizzes

These sessions can be delivered as standalone but work best delivered alongside other resources.

Resource name	Description
Net Zero Board Game	Basic board game to help the understanding of Net Zero. Usually done as part of another session.
Energy Trumps	Energy-based card game to introduce renewable energy.
Net Zero Quiz	A quiz that covers Net Zero, climate change, greenhouse effect and solving the problem. The quiz is designed to allow discussion and to cover key misconception, leads to new understanding, highlight the importance of Net Zero.
Carbon Footprint Quiz	A quiz designed to allow students to calculate their own carbon footprint score. This highlights the impacts their own lives have on global warming. The students look at how they could reduce their own carbon footprint.

We have developed and adapted our resources for extracurricular sessions both inside and outside of schools including:

- Eco / Science Clubs
- Cubs and Scouts – We have developed resources to work towards the Science Badge.
- Holiday / after school clubs

Please get in touch for more information by emailing us at efeducation@northerngas.co.uk or by scanning the QR Code.

