Name: _____

Montsaye ACADEMY
Excellence Resilience Aspiration

Geography

Homework Booklet

Year 7

Term 4: Energy and Resources

Homework 1	Learn keywords	Due date:	Completed?
Homework 2	Guided Reading Activity	Due date:	Completed?
Homework 3	Prepare for knowledge test	Due date:	Completed?

Geography Homework Tasks Term 4

Homework 1 - Learn the keywords below for a mini test at the start of next lesson. You could read through the words, write them out, create a match up activity or get someone to test you.

Keyword	Definition
Non-renewable energy	Energy sources that are finite and will run out e.g. fossil fuels.
Renewable energy	Energy sources that are not finite and will continue to be produced if managed well e.g. wind and solar energy.
Fossil fuels	A natural fuel such as coal or gas, formed in the past from the remains of living organisms.
Global warming	The global rise in temperature across planet Earth.
Energy mix	Describes how much of each fuel type is used within a country.
Fracking	The process of injecting liquid at high pressure into rocks, so as to force open existing fissures and extract oil or gas.
Nuclear power	Power generated by a nuclear reactor.
Wind turbine	A large bladed wheel rotated by the wind to generate electricity.

Homework 2 – Complete the guided reading activity below.
You may wish to write your answers out on paper, so you have more space.

Homework 3 - Learn the facts below, and in the knowledge organiser at the end of this booklet, for a knowledge test next lesson. You could highlight the key information, create revision cue cards or get somebody to test you.

Take 10
UK Climate Change

Case study knowledge is important. Learn these 10 facts and apply them to your 6 and 8 mark questions.

Sea levels could rise, covering low lying areas e.g. East Anglia. 	Scottish ski resorts may have to close to the lack of snow. 
Droughts and flood become more likely as extreme weather increases. 	There will be an increased demand for water in the hotter summers. 
Crops such as oranges, grapes and peaches could be grown in a hotter climate. 	London could be at risk as the Thames Barrier is unlikely to cope with sea level rise. 
In 1997 the UK signed up to the Kyoto Protocol to limit carbon emissions. 	In 2015 the UK signed the Paris Accord to keep global warming below 2°C. 
National strategies: Investment in nuclear/renewables, public transport upgrades, car taxation, etc. 	Local strategies: park and ride, bike hire schemes, congestion charges, car sharing, etc. 

guided READING

1 What is the location of Dogger Bank?

2 How many turbines will there be and how are they described?

3 Why is Dogger Bank described as a engineering feat?

Dogger Bank's giant turbines herald a wind of change in UK industry

Beyond the horizon off the coast of North Yorkshire, a quiet revolution is emerging from the waves of the North Sea.

More than 80 miles from land, hundreds of the world's most powerful wind turbines have begun reaching into the air as construction progresses on the biggest windfarm ever built. Almost 200 turbines, each almost as tall as the Eiffel tower, will soon rise above the submerged Doggerland to populate an expanse of sea as large as North Yorkshire itself.

The Dogger Bank windfarm is an engineering feat that marks a step change in the growth of renewable energy. Each steel structure, weighing 2,800 tonnes, has been designed to soar more than 250 meters from where their heels are buried in the seabed to the top of each 107-metre blade. The staggering scale of the turbines means that each one can generate enough electricity to power 16,000 homes, at less than the average price of electricity in the wholesale energy market.

This offshore windfarm, and others like it, promises to power a surge in clean electricity – which will soon be needed in vast volumes to charge cars, heat homes and produce green hydrogen gas for factories and transport. It is a central part of the government's plan to make the UK carbon neutral by 2050, and to reimagine Britain's global role in what will be an industrial revolution for the low-carbon age.

And it is already playing a significant role: on Boxing Day, Storm Bella ensured that more than half of Britain's daily electricity came from wind turbines for the first time.

The construction of the Dogger Bank farm will fall to one of the UK's few major renewable energy companies, SSE. Built on the legacy of some of Britain's earliest renewable energy projects – its roots are in Scotland's hydro-electricity board – SSE will construct the windfarm in three phases through the 2020s. Each phase represents a multimillion-pound investment, hundreds of jobs in the north-east of England, and enough clean electricity to power millions of homes.

Alistair Phillips-Davies, SSE's chief executive, announced a £6bn financing deal – involving 29 banks and advisers – last month to support the cost of building the first two phases, and the third deal could be announced by this time next year.

"For SSE, and for all our staff, there's definitely nothing that we could be more proud of at the moment than reaching financial close on what will ultimately be a £9bn project," he said.

"It will be the world's biggest, most innovative offshore windfarm. It will generate more energy per turn of those rotors than any other project, enough to power a house for two days. But the amazing thing is, we're going to do more. We're going to see more and more [offshore wind] on the back of the prime minister's 10-point plan."

Boris Johnson's plan for a green industrial revolution relies heavily on offshore wind power, which he hopes to increase threefold to 40GW by 2030. This is important for two reasons. The first is the rapid expansion of the renewable energy industry to help generate enough clean electricity to displace fossil fuels in the energy system, as the UK works to create a net-zero-carbon economy by 2050. The second reason is to spur a supply-chain boom that can help to drive the UK's green economic growth and create substantial numbers of "green-collar" jobs.

"A lot of these offshore facilities are in less well-known places. They're all around the edges of the UK, in places that probably need investment and more jobs. So it's a fantastic opportunity," Phillips-Davies said.

"I think we're at over 1,000 green jobs created so far, and close to £10bn-worth of projects done. So we feel like we're in a really strong place, and I hope we can go forward strongly from here over the next decade."

4 Why will there be a need for more electricity?

5 What happened on Boxing day?

6 Who are SSE and what's their history with renewable energy?

7 How much will it cost and who's paying for it?

8 How much energy will one turn generate?

9 Name the first reason why the green revolution relies on wind power?

10 Name the second reason why the green revolution relies on wind power?

11 What benefits will offshore wind farms bring to the local communities?

12 How many green jobs are there and what is their value?

Montsaye ACADEMY

Year 7 Geography Knowledge Organiser
Energy and Resources

Without Geography, you're nowhere!

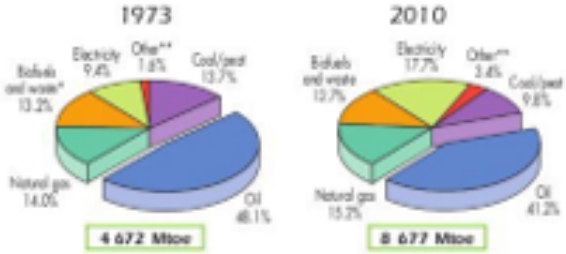
Topic overview

- What different types of energy do we use?
- Why is electricity supply changing in the UK?
- How do we use gas as an energy source in the UK?
- How can the use of oil affect the environment?
- How is energy use leading to global warming?
- What are the alternatives to non-renewable energy?
- Could solar energy benefit the people of Rothwell and Desborough?
- Where should we build a new wind farm in the UK?
- Should the UK use more renewable energy?

Keywords

- **Non-renewable energy**: Energy sources that are finite and will run out e.g. fossil fuels.
- **Renewable energy**: Energy sources that are not finite and will continue to be produced if managed well e.g. wind and solar energy.
- **Fossil fuel**: a natural fuel such as coal or gas, formed in the geological past from the remains of living organisms.
- **Global warming**: the global rise in temperature across planet Earth.
- **Energy mix**: Describes how much of each fuel type is used within a country.

Energy use in the UK



The **energy mix** describes how much of each fuel type is used within a country. **Renewable energy** is generally defined as energy that comes from resources which are naturally replenished on a human timescale such as sunlight, wind, rain, tides, waves and geothermal heat.

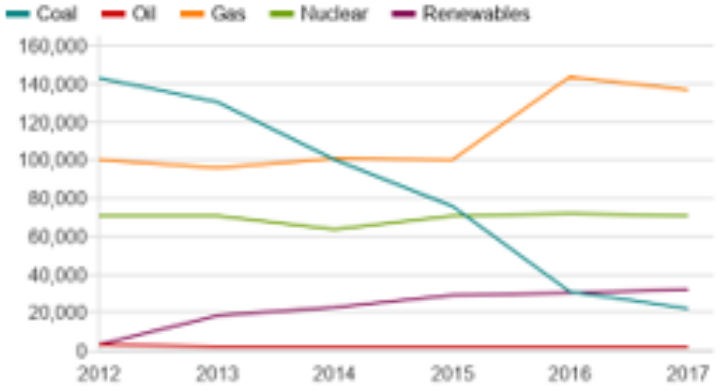
The original organic material, with the aid of heat and pressure, becomes a fuel such as oil or gas. Fossil fuels (such as coal, petroleum, and natural gas) are all **non-renewable energy** resources. These take millions of years to form.

Non-renewable energy

Primary energy sources such as coal and oil are often converted into electricity. In Britain a supergrid of major electricity cables on pylons carries the main supply of electricity from power stations which are powered by coal, oil, gas or nuclear energy. Some power stations are even powered by water. The majority of power stations in Britain used to be powered by coal.

UK electricity generation

Gigawatt Hours (GWh)



Source: Department for Business, Energy & Industrial Strategy

Renewable energy

Method	How it works?	Advantages	Disadvantages
Hydro-electric power (HEP)	If a dam is built across a fast-flowing river, a lake will form behind the dam. If the water in the lake is allowed to flow through turbines in the dam wall, electricity can be generated.	HEP is the best way of storing potential energy that can be turned into electricity.	Hydroelectric dams are expensive to build and can damage the habitat if they flood new areas of land and dry up others.
Tidal energy	Large volumes of seawater move as the earth spins and the moon attracts the water on the surface of the earth. This tidal movement of water contains a lot of energy and if the water is captured and allowed to flow through turbines, it can generate electricity.	Very reliable source of electricity providing sea levels don't change in the area.	Tidal barrages are expensive to build. Habitats are damaged on either side of the barrage. Wildlife like fish and birds can get sucked into the turbines.
Wave	Waves and moving water and each wave can turn a very small turbine. Electricity can be generated from floating lots of tiny turbine mechanisms on the surface of the sea to collect this energy.	Captures energy that would otherwise not be collected and can reduce rough seas.	Take up lots of space and difficult for shipping to move round.
Wind	Gusts of wind can blow the blade of a turbine, which then turns a generator to create electricity.	The lookout is very windy and in theory wind turbines could produce a lot of electricity.	Not a reliable source of energy. Turbines can be noisy and some people find them ugly.
Geothermal energy	Water can be pumped underground where heat from underground rocks can turn water into steam, which can turn turbines.	Reliable source of alternative energy.	Not many places where the ground is hot enough to generate electricity like this.
Solar panels (hot water)	The sun gives out a lot of heat radiation. Water can collect some of this heat if it passes through black tubes exposed to sunlight.	Once the unit has been bought and set up, there is free warm water every day.	Water is not very hot. No hot water late at night and water is cooler on cloudy days.
Solar photovoltaic cells (electricity)	Solar cells (also called Photovoltaic or PV cells) generate electricity from sunlight.	Scientists are designing more and more clever and efficient versions.	They are quite expensive to make. Some use polluting chemicals in manufacture. They don't generate electricity if it isn't sunny.
Biofuels	Food fuels to make them last longer. Biofuel can be produced from any plant but sugar and wheat are currently used) and biodiesel (from oily crops such as sunflower and palm).	These fuels help take carbon dioxide out of the atmosphere.	Intensive cultivation, which can damage habitats. Biofuel crops prevent farmers growing food crops. When burnt the carbon goes back into the atmosphere.
Biomass	Biomass is any organic material e.g. wood, animal dung, waste food, non-edible parts of plants. These can be burnt as a fuel.	These fuels help take carbon dioxide out of the atmosphere.	When these are burnt they put carbon dioxide back into the environment and if they were transported, they used carbon in their lifetime.