AQA

GCSE
GEOGRAPHY

Resources for Paper 3 Geographical Applications

June 2021

Pre-release resources booklet

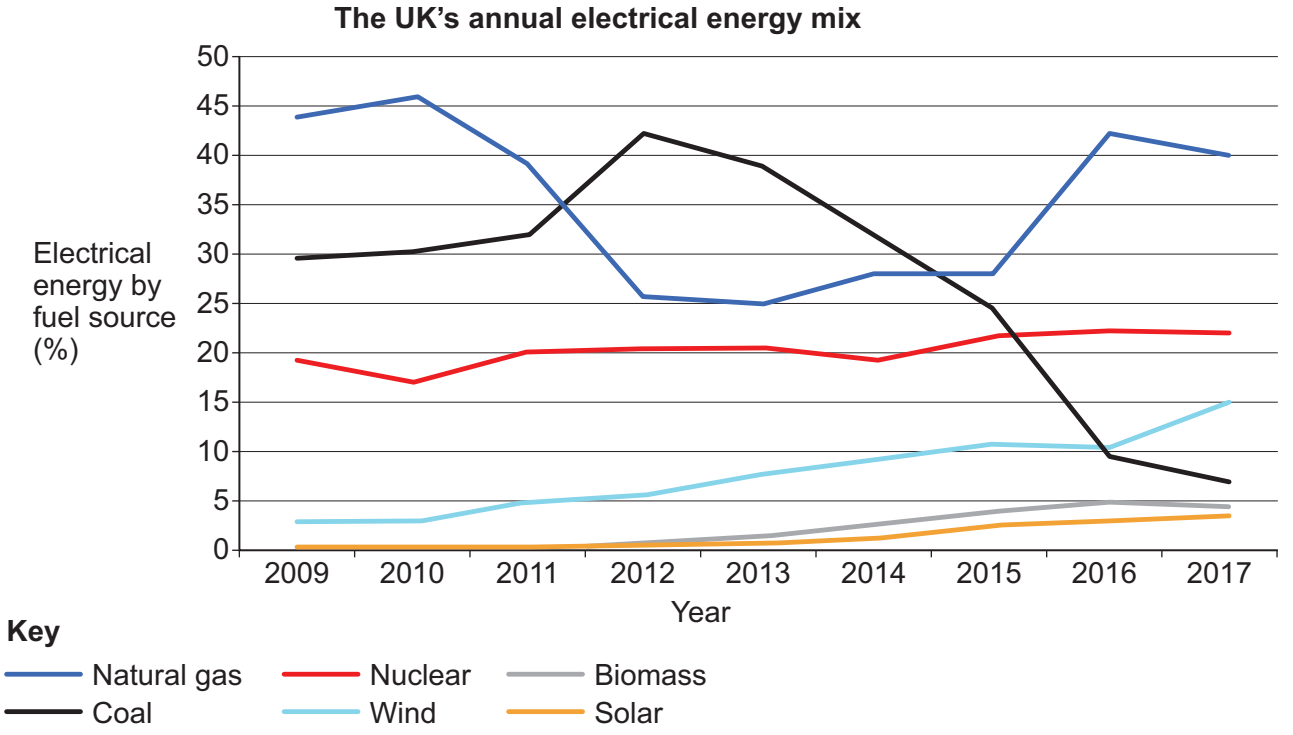
To be issued to students on Wednesday 10 March 2021.

This booklet contains three resources as follows:

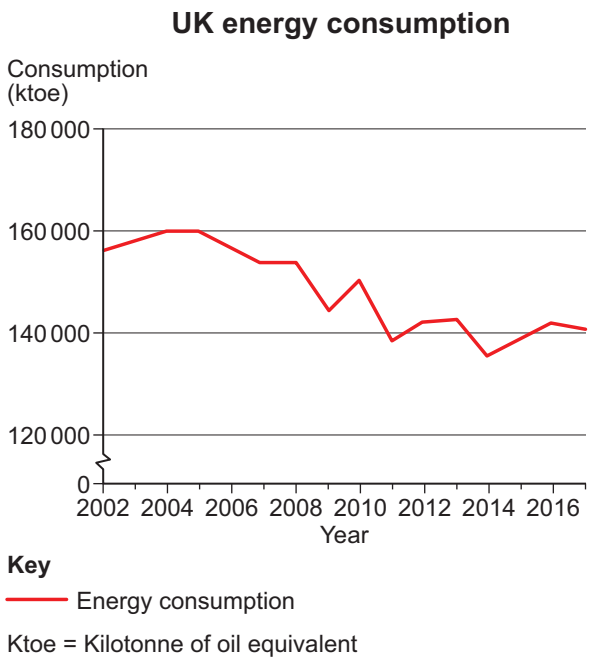
- Figure 1 – The changing pattern of energy production and use in the UK: pages 2–3
- Figure 2 – Energy futures – the development of renewable energy sources: pages 4–5
- Figure 3 – Views about the proposed Isle of Lewis wind farm development: pages 6–7

Figure 1

The changing pattern of energy production and use in the UK



The last thirty years have seen a steady growth in the use of renewable energy. However, there is no doubt that fossil fuels will continue to play a significant role in the UK's total energy mix in the future. Estimates suggest that the use of renewables for electricity generation will continue to grow but the move away from fossil fuels used to power transport will be slower. There is some concern that the continued use of fossil fuels to power vehicles will add to the problem of climate change. However, the continued shift towards renewable energy will help to manage climate change. In addition, conservation methods and more efficient use of energy will reduce energy demand in the future.



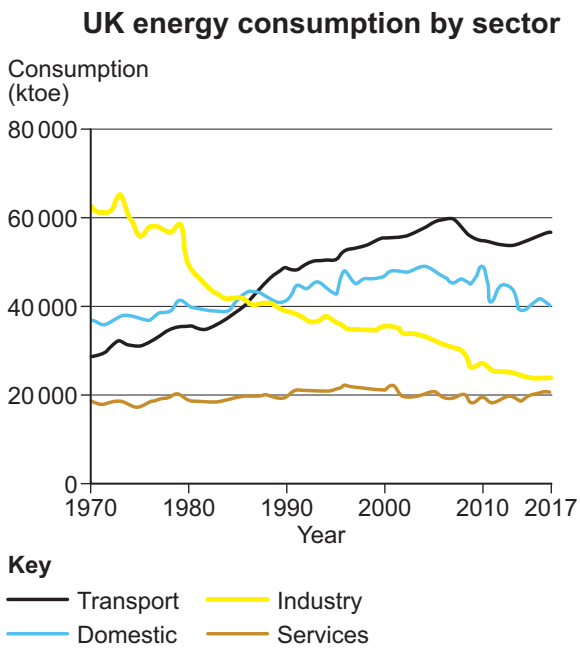


Figure 1 continued

The changing pattern of energy production and use in the UK

UK electricity use falls – as rest of EU rises

The UK was the only country in the EU to reduce its energy consumption last year. In the UK, demand for energy has been falling in recent years as large scale industry has declined and households have used energy more efficiently. The UK's power consumption decreased by nearly 2%, while it increased by 0.7% across the EU as a whole. Overall, electricity demand in the UK has fallen by 9% in the last seven years, the biggest decline in the EU. The demand for electricity within the EU has increased as countries push for economic growth and populations grow.

The differences in the patterns of consumption cannot all be accounted for by the differences in economic and population growth. Also, the weather did not appear to play a major part because it was equally mild throughout Europe. Carbon and power analysts suggest that the differences may be a result of the increasing use of electric vehicles and the growth in the use of air conditioning in some countries. Recent evidence also suggests that UK consumers are buying more energy efficient products.

Adapted from *The Guardian*, 30/01/2018

Renewables provide more than half UK electricity for the first time

Renewable sources of energy have generated more electricity than coal and gas in the UK for the first time.
The National Grid reported that at Wednesday lunchtime power from wind, solar, hydro and wood pellet burning supplied 50.7% of UK electricity. As the weather was both sunny and breezy, the conditions were perfect for generating energy from renewables and approximately 10% of the UK's power came from offshore wind farms.

(*BBC News* environment report, 08/06/18)



Figure 2

Energy futures – the development of renewable energy sources

How 'green' is renewable energy?

All types of energy generation can create environmental challenges. The exploitation and use of fossil fuels can lead to land and water pollution, and add to the threat of climate change. The use of renewable energy sources is considered 'green' because they do not have a significant negative effect on the carbon balance. However, they are not environmentally neutral.

Hydro-electricity

- Large areas of land flooded
- People forced to leave towns and villages
- Natural flow of river blocked or diverted



Biomass

- Large areas of land used
- Reduction in biodiversity
- Clearing land for fuel crops creates greenhouse gases
- Processing fuel crops uses energy



Wind energy

- Negative visual impact
- Noise may disturb wildlife
- Trees removed
- Large amounts of concrete used in construction



Solar energy

- Large areas of land used
- Solar thermal plants use a lot of water for cooling
- Construction of solar panels creates highly toxic waste



A leaflet about a planned renewable energy project in Cornwall

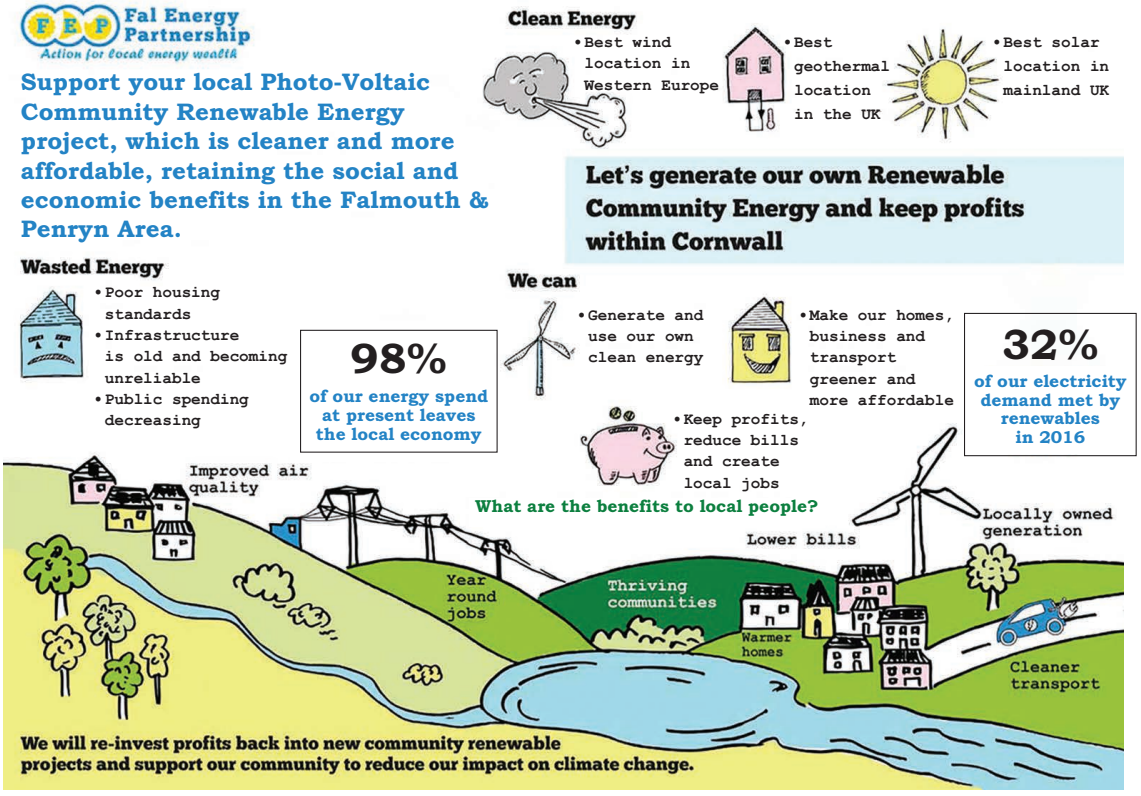
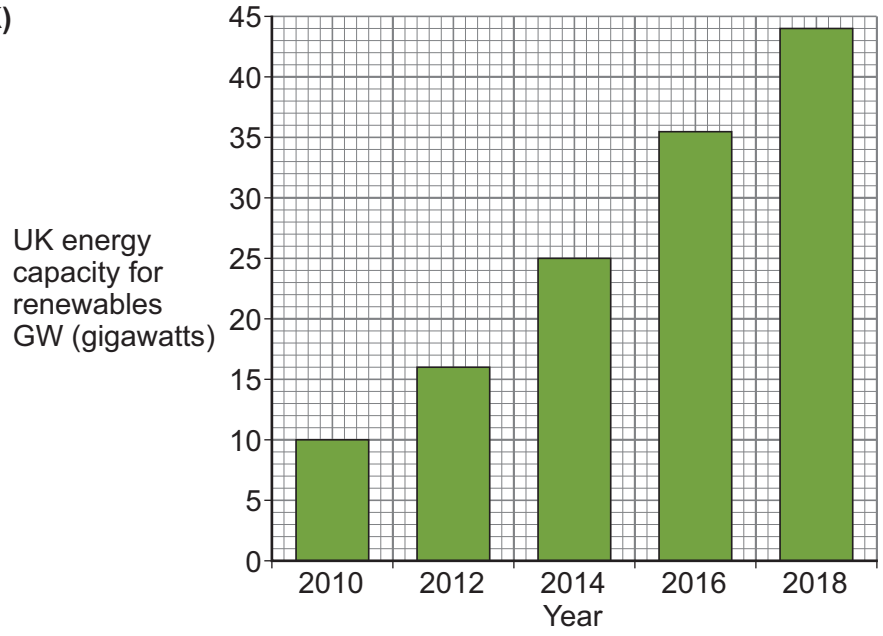


Figure 2 continued – Energy futures – the development of renewable energy sources

Renewable energy capacity (UK)

"The issue with renewable energy may be a question of scale. Large scale projects can generate a large amount of energy and bring significant economic advantages to both local and regional areas. However, they also have the potential to create significant environmental problems, especially if they are not managed effectively. Smaller scale projects may only generate a limited amount of energy but are often seen as more environmentally sustainable." (Energy consultant)



Tallest onshore wind turbines in Scotland planned for the Isle of Lewis

An energy company has published plans to build over 80 huge wind turbines, 45 at the Uisenis site and 36 on grazing land on the outskirts of Stornoway, the main town on the Isle of Lewis. The turbines would be up to 200 metres tall, higher than any existing onshore wind turbines in Scotland. The company says that the scale of the turbines will mean that fewer turbines will be required in order to generate the required power and that the excess generated power will be transported to the Scottish mainland via a new cable system. There are mixed feelings about the proposed development. Many local people feel that it will bring much needed jobs and create business opportunities in an area that has suffered from declining population in recent years as younger people move away in order to seek employment. This is shown by the way that existing wind energy schemes have created opportunities for local people with some of the money generated being put into local community schemes. Other people feel that the wind turbines are too big and will be very intrusive, possibly putting off visitors and damaging the tourist industry. As one local writer/blogger said, "These super turbines are the same size as the giant turbines being built in the North Sea and they are built offshore for a good reason, because their enormous size is thought to make them unacceptable anywhere onshore, especially in pristine environments like the Isle of Lewis."

(Adapted from *Stornoway Gazette*, 01/05/2018 and *The Scotsman*, 01/05/2018)

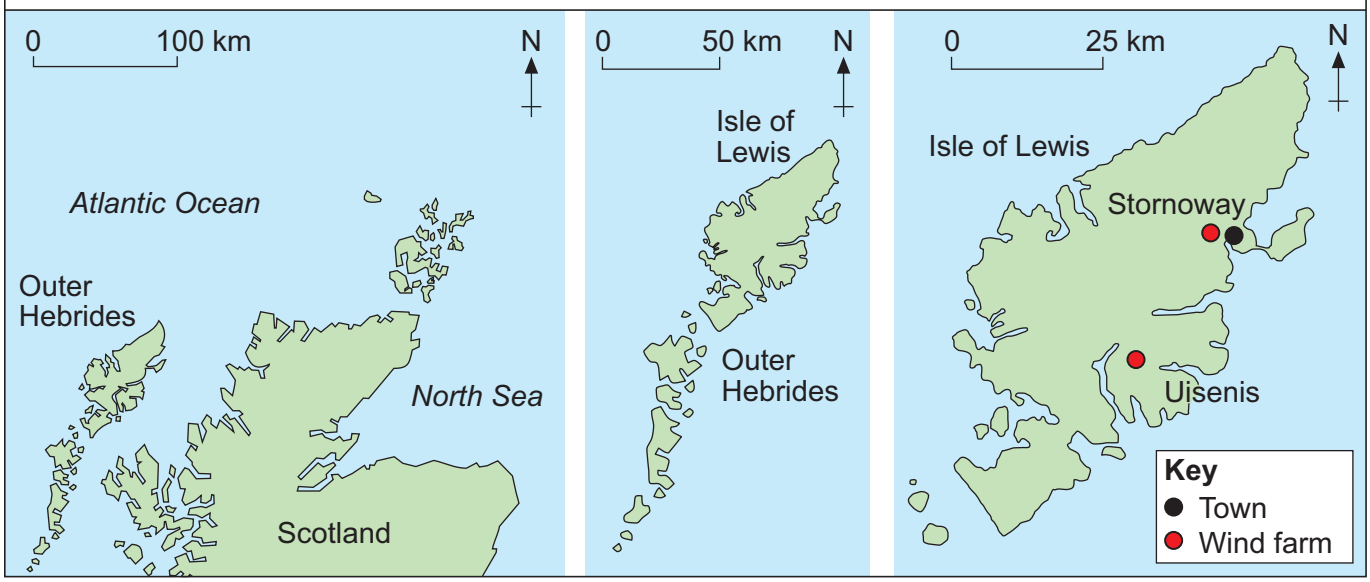


Figure 3

Views about the proposed Isle of Lewis wind farm development

Lewis Wind Power

Lewis Wind Power has proposed two wind farm projects at Stornoway and Uisenis. These projects would make the most of the wind resources on the Isle of Lewis in the Outer Hebrides. The two wind farms would produce low-cost power for consumers across Great Britain while also creating local economic opportunities. The projects, along with the proposed mainland interconnector, could generate hundreds of local jobs and add up to £33 million annually to the local economy. The company has been working with the local community for many years to ensure that there is a community stake in any current and future projects.

Benefits of the proposed project:

- Community Ownership – Lewis Wind Power is working closely with local community groups to allow them to invest in the project.
- Community Benefit Payments – The wind farms would pay significant sums into local trusts which could be distributed to local projects and organisations.
- Rental Payments – Stornoway Wind Farm would pay an annual rent to the local authority and make payments for each area of grazing land used.
- Building of the Mainland Interconnector – No further onshore wind farm development can take place unless a mainland connector is built because the current network is at full capacity.
- Employment and Wider Economic Development – It is estimated that 600 jobs will be created during construction.

(Adapted from *lwp.scot/edfenergy*, 2018)

"The athletics club has had financial support from Lewis Wind Power, enabling it to develop successfully and allowing local athletes to travel to the mainland for competitions."



Coach of local athletics club

Hotel manager



"We have to allow this development because it will create jobs and opportunities for local business as well as boosting the hospitality industry."

"These projects are vital for local business and the community. They will bring jobs to the area and the opportunity for skills-based training."



Business manager

"We have used the communal land to graze animals for generations and building wind turbines there will change our way of life."

Local crofter

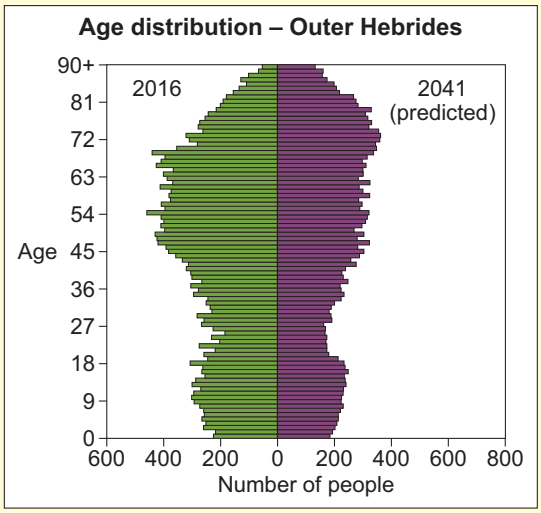


Scotland has more than half of the UK's wind turbines

It has been claimed that the desire to build more wind turbines in Scotland is completely out of control, after official figures showed that Scotland now has more than half of the UK's onshore turbines. It has been suggested that Scotland's countryside is in danger of being 'swamped' by wind farms, and areas that are already 'saturated' with turbines are being put under pressure to accept more. A Scottish energy spokesperson said, "It is foolish to put such emphasis on unreliable energy sources which can damage the landscape for residents and tourists". A recent poll found that two thirds of walkers and climbers said that turbines were making Scotland a less appealing place to visit. It has been claimed that more than five million trees have been chopped down to make way for turbines.
(*The Telegraph*, 11/04/14)

Figure 3 continued – Views about the proposed Isle of Lewis wind farm development

Outer Hebrides battle to reverse steep population decline



The population of the Outer Hebrides is predicted to decline by 13.7% by 2039 – the steepest fall of any Scottish region. The number of Islanders of working age is predicted to decline by 21%, and the number of children aged 15 or below will fall by 28%. Council leader Angus Campbell said, "Population decline is the biggest threat facing our islands and action must be taken to reverse this. This is why we need to do everything we can to make the area an attractive place to live and work. Realising our renewable energy and tourism potential will help, otherwise younger people will be forced to leave the islands to seek work elsewhere."

RSPB claim that Lewis wind farm plans threaten eagles

RSPB Scotland has claimed that the proposed wind turbines may harm golden eagles and sea eagles. The RSPB does not oppose wind power developments as a way of reducing carbon emissions where turbines do not pose serious threats to wildlife or habitats, but they feel that planning applications must take into account the importance of sites to eagle populations.

Plans for tallest UK onshore wind farms create conflict

Plans to build some of the tallest wind turbines on the Isle of Lewis have caused an angry response from some local residents. Local crofters have objected to the proposals to build on communal land near Stornoway, the largest town in the Outer Hebrides. Local community groups want to build their own smaller turbines, with profits going directly to local causes. This has already been done in the Point and Sandwick area, where three turbines have been built; the profits are being used to support local health services and an arts project. There is also concern about the effect on the tourist industry and a fear that the scale of the proposed turbines will make the area less attractive. The company proposing the development has said that the number and size of the turbines is required in order to justify building a new mainland connector, which will transfer electricity to the mainland, and that without it the area will not be able to fully realise its energy potential and create the job opportunities and income that it needs.



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