Oxford Revise | Geography | Answers

Chapter 40 Access to energy resources

All exemplar answers given are worth full marks.

1.

a)

i) There is much less solar radiation in the north than in the south, with NW Scotland having 12-14 MJ/m^2 compared with Cornwall where most of the county has 17–19 MJ/m^2. The coastline is warmer than inland. The coastline of Wales is 18 MJ/m^2 compared to the interior which averages at 16 MJ/m^2. Upland regions, such as North Yorkshire Moors and Pennines, have noticeably less solar radiation than adjacent areas by 2 or 3 MJ/m^2.

ii) In both January and July, the northern regions receive less solar radiation than the southern regions. For example, NW Scotland receives the least solar radiation in both January and July. Contrasts between inland and coastal locations are more marked for July. For example, the south coasts of England and also Wales receives 18–19 MJ/m^2 in July compared to the area immediately inland, which only receives 17–18 MJ/m^2. Similarly, the west coast of Scotland receives higher amounts of solar radiation in July. There are several exceptions, such as Dartmoor which receives the least amount of solar radiation in southern England in July.

iii) Upland regions will have stronger winds and so have greater potential to produce wind power. Solar panels in UK benefit from being positioned southwards to benefit from the greatest number of hours of sunshine. The shape of the coastline and its orientation to oncoming waves is important when harnessing the maximum amount of energy from waves – a wave which has travelled over a long distance or fetch has the most potential. The bigger the tidal range the more potential a location has for producing tidal power. The best location for HEP is where the river valley narrows and there is a gorge or canyon. This reduces the amount of land that must be flooded when the reservoir is created.

2.

a)

i) China's industrial areas are concentrated in the eastern half of the country. They tend to be close to or part of large conurbations, such as Shanghai and Beijing. They are also close to energy resources, particularly oil and gas fields.

ii) China is rapidly industrialising with the main growth in manufacturing industries. There is more personal wealth, so people are buying more consumer goods. This results in a greater demand for energy.

iii) There is not completely true. Some of China's energy resources are in remote locations and so may be less economically viable, for example there are large coal fields, oil and gas fields in north-western China which is remote. This area is also mountainous and has a very harsh climate. However, despite the costs of extraction and transportation of oil, gas, and coal, the demand for energy means that it is still economically viable. In other locations, particularly around large urban centres in the east such as

Beijing where there is a high demand for energy, there are accessible and economically viable energy resources.

b) This question is level-marked:

Level	Marks	Description
3	6–8	• Accurate understanding of concepts and the interrelationship of places, environments and processes. • Applies understanding to deconstruct information and make logical connections throughout. • A balanced, well-developed argument. Judgements are supported with evidence throughout. • Uses geographical skills to obtain accurate information that supports arguments.
2	3–5	• Some understanding of concepts and the interrelationship of places, environments and processes. • Applies understanding to deconstruct information and make some logical connections. • Imbalanced argument with mostly relevant information. Judgements are occasionally supported with evidence. • Uses geographical skills to obtain accurate information that occasionally supports arguments.
1	1–2	• Isolated elements of understanding of concepts and the interrelationship of places, environments and processes. • Attempts to apply understanding to deconstruct information but this is flawed. • Unbalanced or incomplete argument with limited understanding. Judgements are supported with limited evidence. • Uses some geographical skills to obtain information with limited relevance and accuracy.
	0	No acceptable response

Example answer: *Access to energy resources is affected by several physical and human factors. Fossil fuel energy resources are only found in particular geological formations. As similar processes are needed for their formation, gas and oil deposits are often found together. Africa is a continent where there are the fewer locations where fossil fuels are found although it probably has the greatest potential to produce renewable energy. The more accessible resources are used first. Advances in technology then allow less accessible resources to be extracted later. For example, shallow seams of exposed coal are usually open cast mined first and then deeper shafts sunk when technology overcomes flood risks and poor ventilation.*

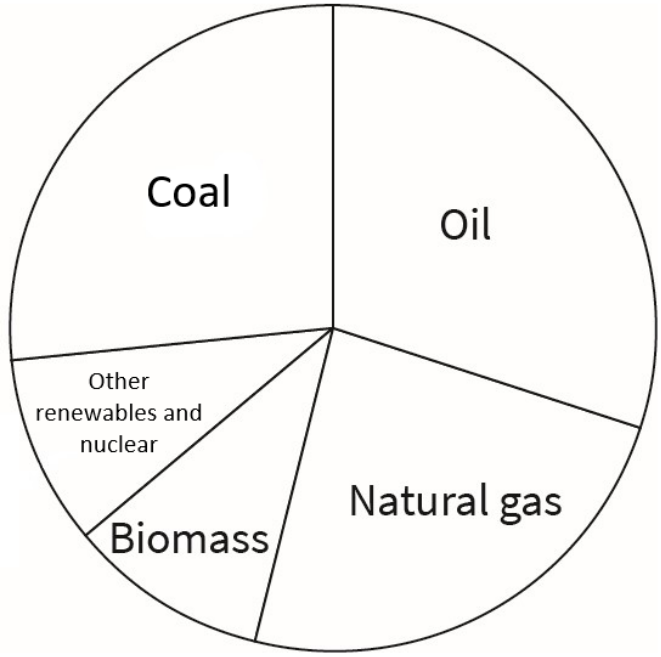
The prevailing climatic conditions, such as wind and solar radiation, impacts on the type of renewable energy that can be produced and how large its potential generation. For example, it is no coincidence that the largest solar farms are in low latitudes with the greatest concentration of solar radiation and longest hours of sunlight.

Wind turbines are best in located coastal or upland locations where there are constant winds with high average wind speeds. Offshore locations are favourable because the winds out to sea tend to be stronger and more constant. There needs to be the necessary finance and technological expertise for a country to fully exploit its energy resources.

3.

a)

i) The pie chart should be completed as below:



ii) Oil is the most important source of energy, approaching one-third of the total. Coal (26%) and natural gas (24%) complete this 80% dominance of fossil fuel dependency. Biomass accounts for a further 10% with other renewables and nuclear the remaining 10%.

b) There is increasing energy consumption globally because of population growth. By 2050 global population is expected to reach 9.3 billion. Economic development has led to urbanisation, industrialisation, and greater wealth, all of which led to increased energy consumption. The same has happened with the increased use of computers, electric cars, air conditioners, and other electrical equipment.