6.1 Global and UK Resource Security: Trends in Food, Water and Energy: 30-minute Pack

AQA 8035 · Calculators not allowed · about 30 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Define 'food security' in the context of human wellbeing and economic development.

(Total for Question 1 is 2 marks)

2 Define the term 'water scarcity' as used in studies of resource security.

(Total for Question 2 is 1 mark)

3 State whether the UK is becoming more or less dependent on imported food in recent decades.

(Total for Question 3 is 1 mark)

4 'The UK should aim for complete energy self-sufficiency using domestic renewable sources.' To what extent do you agree with this statement?

(Total for Question 4 is 8 marks)

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5 Explain why 'food miles' are a concern for resource security and environmental impact in the UK.

(Total for Question 5 is 4 marks)

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6 Table 1 compares typical resource consumption and access figures, grouped by country type. Use Table 1 to answer the following.

Table 1, Typical resource indicators by country group (hypothetical practice figures)

Indicator	HIC	NEE	LIC
Average calorie intake per person per day (kcal)	3400	2800	2100
Access to safe drinking water (per cent of population)	99	85	60
Access to electricity (per cent of population)	100	95	40

(a) Using Table 1, state which country group has the highest average calorie intake. **(1)**

(b) Using Table 1, calculate the difference in average calorie intake between HICs and LICs. **(2)**

(c) Describe the overall pattern shown by the three indicators across HICs, NEEs and LICs. **(3)**

(d) Suggest one reason why access to electricity is much lower in LICs than in HICs, using economic or geographical reasoning. **(2)**

(Total for Question 6 is 8 marks)

7 The UK's electricity generation from coal fell from 65% in 1990 to 2% in 2020. Calculate the percentage point change and state whether this is an increase or a decrease.

(Total for Question 7 is 2 marks)

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Mark scheme · 6.1 Global and UK Resource Security: Trends in Food, Water and Energy: 30-minute Pack

Question 1

having reliable access to sufficient, safe and nutritious food to meet dietary needs, oe **B1**

so people can lead active, healthy lives and contribute to development, oe **B1**

Answer: Food security is having reliable access to sufficient, safe and nutritious food to meet dietary needs so people can lead active, healthy lives and contribute to development.

Question 2

when demand for fresh water exceeds the available supply or when water is not sufficient in quality for use, oe **B1**

Answer: Water scarcity is when demand for fresh water exceeds the available supply or when water is insufficient in quality for use.

Question 3

more dependent on imported food **B1**

Answer: The UK has become more dependent on imported food in recent decades.

Question 4

Level 3 A well-developed, balanced assessment that uses accurate reference to UK energy trends, the potential and limits of domestic renewables, supply security, economic and environmental considerations, and reaches a clear justified conclusion. **7-8**

Level 2 A clear assessment that considers benefits and limitations of domestic renewables with some supporting evidence, but with less balance or weaker justification in the conclusion. **4-6**

Level 1 Basic points about benefits or drawbacks of self-sufficiency are made with limited development, and no justified conclusion. **1-3**

Level 0 No relevant content. **0**

Indicative content:

- Arguments for the statement: domestic renewables reduce import dependence and exposure to international fossil fuel price shocks, increase long term sustainability and reduce CO2 emissions, and can improve local jobs and skills.
- Arguments against the statement: renewables are intermittent and currently cannot reliably provide all baseload demand without large storage or backup, full self-sufficiency may be very costly and require large land or offshore areas with environmental trade-offs.
- Practical considerations: diversification of the energy mix including imports, interconnectors, storage, demand management and some low-carbon dispatchable sources (e.g. gas with carbon capture, nuclear) may give more reliable and affordable supply than relying only on domestic renewables.
- Economic and social factors: rapid transition costs, public acceptance of infrastructure such as wind farms and grid upgrades, and the timescale for scaling storage and network upgrades are important.
- A balanced conclusion may accept the goal of maximising domestic low-carbon generation while arguing that complete self-sufficiency is currently unrealistic or undesirable without major investment in storage and backup, so a mixed approach is preferable.

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Question 5

food miles measure the distance food travels from production to consumption, oe **B1**

long transport distances increase fossil fuel use and CO2 emissions, harming environmental sustainability, oe **B1**

reliance on imports increases vulnerability to supply disruptions and foreign price changes, affecting food security, oe **B1**

local food production can support resilience and reduce transport emissions, though it may not always be the most efficient use of land, oe **B1**

Answer: Food miles measure how far food travels; long distances increase fossil fuel use and CO2 emissions, and heavy reliance on imports makes the UK more vulnerable to supply disruptions and international price changes. Supporting local production can improve resilience and reduce transport emissions, though local production has its own limits.

Question 6

(a) HIC **B1**

(a) Answer: HIC.

(b) 3400 - 2100 seen, oe **M1**

(b) 1300 kcal cao **A1**

(b) Answer: 1300 kcal.

(c) values fall from HIC to NEE to LIC for all three indicators, oe **B1**

(c) HICs have highest calorie intake and near-universal access to water and electricity, oe **B1**

(c) LICs have the lowest calorie intake and much lower access to safe water and electricity, showing clear global inequalities, oe **B1**

(c) Answer: All three indicators decline from HIC to NEE to LIC: HICs show the highest calorie intake and almost universal access to water and electricity, NEEs are intermediate, and LICs have the lowest calorie intake and far lower access to safe water and electricity, indicating clear global inequalities.

(d) lower income and limited infrastructure investment in LICs, oe **B1**

(d) linked detail, e.g. building and maintaining grids is costly and sparsely populated rural areas are expensive to service, oe **B1**

(d) Answer: LICs often have lower incomes and limited investment in infrastructure; building and maintaining electricity grids is expensive and servicing sparsely populated rural areas is costly, so many people lack access.

Question 7

65 - 2 seen, oe **M1**

63 percentage points decrease cao **A1**

Answer: 63 percentage points decrease.

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