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EDEXCEL INTERNATIONAL GCSE GEOGRAPHY: QUESTIONS BY TOPIC

Economic Activity and Energy (Topic 4)

International GCSE Geography Topic 4

32 questions · 688 marks · Mark schemes included

Pearson Edexcel International GCSE (9–1) Geography 4GE1, Papers 1, 1R, 2 & 2R, June 2019 - June 2025

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HOW TO USE THIS BOOKLET

Questions are grouped by sub-topic (exam questions, then fieldwork), oldest paper first.
Click any heading or question row below to jump straight to it.
On every question page, click ANSWER in the top-right corner to jump to its mark scheme.
Diagrams, graphs, tables and data are printed exactly as they appeared in the original papers.

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ECONOMIC ACTIVITY AND ENERGY: EXAM QUESTIONS	16 questions · 400 marks		**3**
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FIELDWORK: INVESTIGATING ECONOMIC ACTIVITY AND ENERGY	16 questions · 288 marks		**99**
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28. **Q4**	Paper 2 June 2024	20	**143**
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QUESTIONS

32 questions · 688 marks · grouped by sub-topic

SUB-TOPIC

ECONOMIC ACTIVITY AND ENERGY: EXAM QUESTIONS

16 questions in this booklet

If you answer Question 1 put a cross in the box ☒

1 Economic activity and energy.

(a) Identify what is meant by an **economic sector**.

(1)

☒	**A** the chain of production in manufacturing
☒	**B** an economic shift in employment
☒	**C** a classification system for types of employment
☒	**D** a classification of employment structures

(b) Identify the economic sector that includes agriculture as an activity.

(1)

☒	**A** quaternary
☒	**B** tertiary
☒	**C** secondary
☒	**D** primary

(c) Define the term **raw material**.

(1)

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.....

(d) Study Figure 1a in the Resource Booklet.

Suggest **one** piece of evidence that shows there is informal employment in this photograph.

(2)

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(e) State **one** example of a renewable energy resource.

(1)

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(f) Explain **two** reasons why the production of energy varies between countries.

(4)

1 .....

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2 .....

(g) Study Figure 1b in the Resource Booklet.

Suggest **one** reason for the projected increase in energy demand in Asia.

(3)

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(h) For a named developing **or** emerging country, explain **two** ways the increasing demand for energy has created problems.

(4)

Named developing or emerging country .....

1 .....

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2 .....

(i) Study Figure 1c in the Resource Booklet.

Analyse the reasons for changes in primary and quaternary employment.

(8)

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Figure 1a

Examples of informal employment in Bangladesh

(Source: © David Holmes)

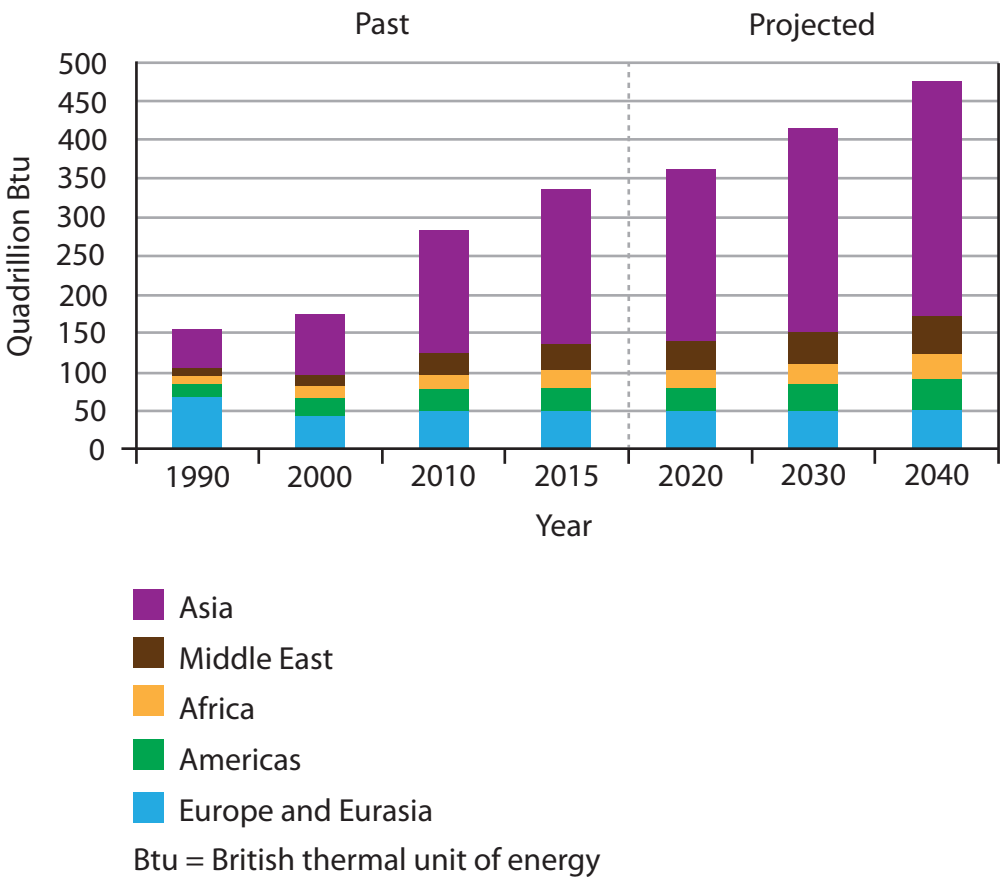


Figure 1b

Past and projected energy consumption for selected regions

(Source: from https://www.eia.gov/)

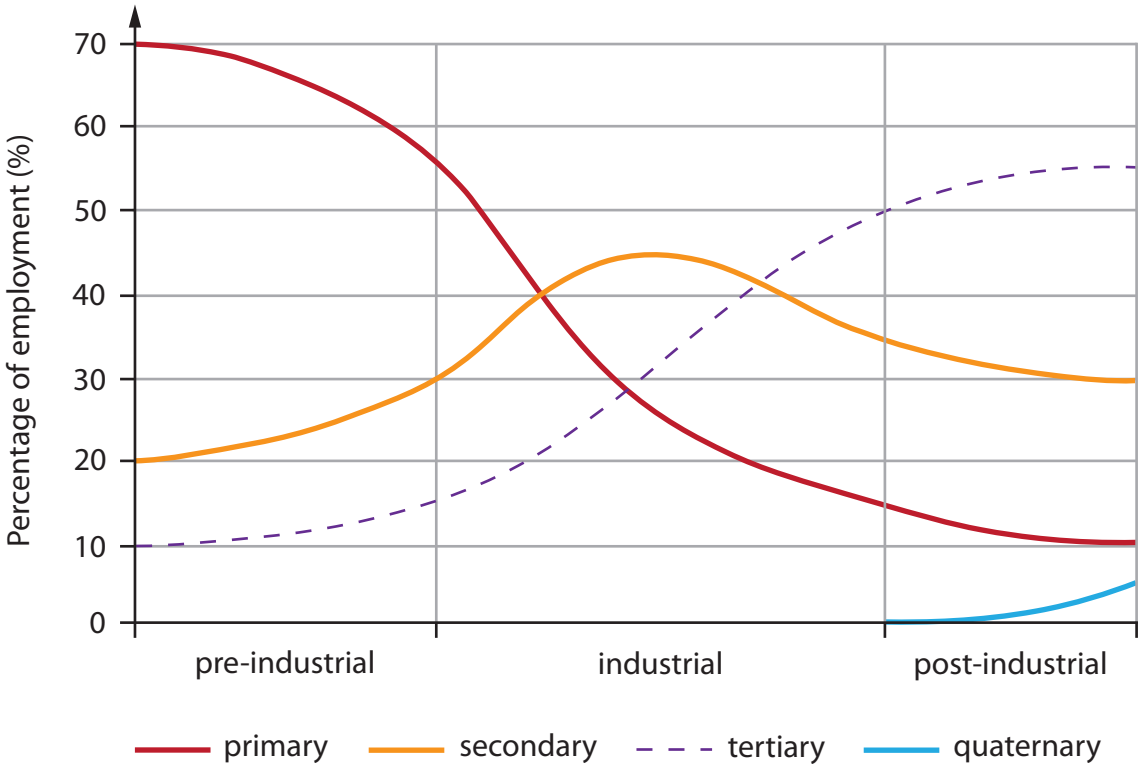


Figure 1c

The Clark Fisher model

If you answer Question 1 put a cross in the box ☒

1 Economic activity and energy.

(a) The Clark Fisher model is used to describe the process of industrialisation.

Identify the stage which is characterised by agriculture being the most important sector.

(1)

☒	**A** pre-industrial phase
☒	**B** industrial phase
☒	**C** development pathway phase
☒	**D** post-industrial phase

(b) Define the term **employment structure**.

(1)

.....

.....

(c) Identify the economic sector that includes manufacturing as an activity.

(1)

☒	**A** quaternary
☒	**B** tertiary
☒	**C** secondary
☒	**D** primary

(d) Study Figure 1a in the Resource Booklet.

Suggest **one** reason that has influenced the proportions of GDP shown in Turkey.

(2)

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(e) State **one** example of a non-renewable energy resource.

(1)

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(f) Explain **two** reasons why energy demand varies globally.

(4)

1 .....

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2 .....

(g) Study Figure 1b in the Resource Booklet.

Suggest **one** reason for the shift in manufacturing production shown on Figure 1b.

(3)

(h) For a named **developing** or **emerging** country, explain **two** ways energy resources have been managed in a sustainable way.

(4)

Named developing or emerging country .....

1 .....

2 .....

(i) Study Figure 1c in the Resource Booklet.

Analyse the reasons for the different population and resource relationships shown.

(8)

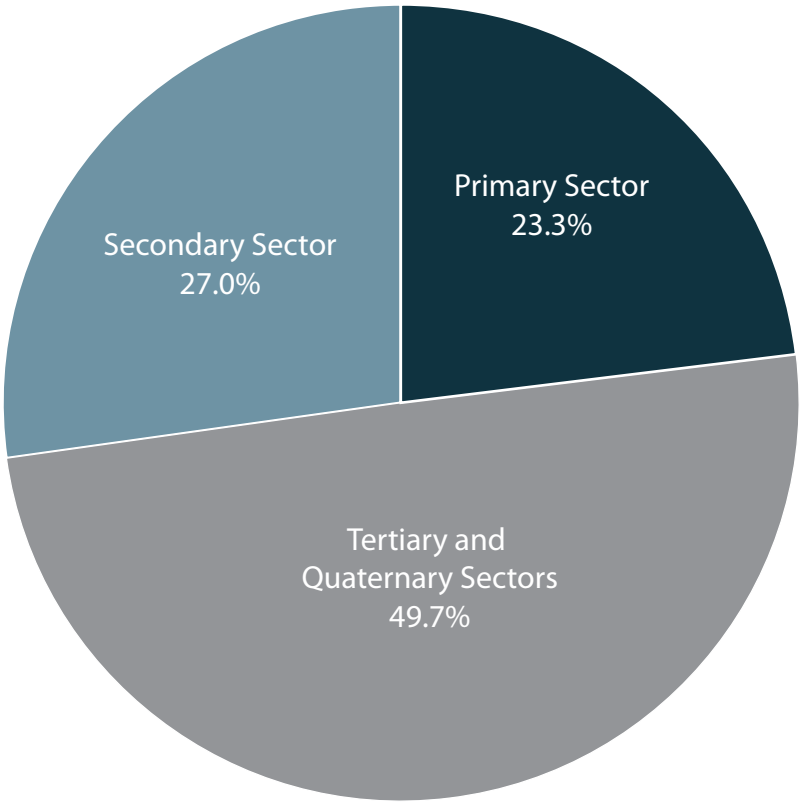


Figure 1a

Proportion of Turkey's GDP by different economic sectors, 2002 to 2013

Ford to shift production of the Focus to China

Carmaker will move manufacturing out of the US as planned, but not to Mexico



(Source: © REUTERS News Agency)

Figure 1b

A newspaper extract about the changes in car manufacturing

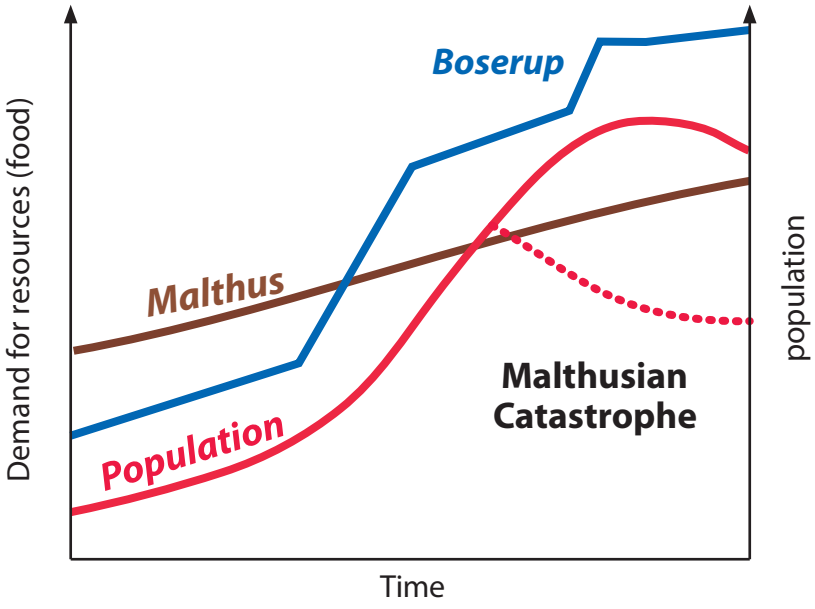


Figure 1c

A diagram of the theories of Malthus and Boserup

If you answer Question 1 put a cross in the box ☒.

1 Economic activity and energy

(a) Identify the meaning of the term **biomass energy**.

(1)

☒	**A** energy from seawater
☒	**B** energy from freshwater
☒	**C** energy from plants
☒	**D** energy from the sun

(b) Define the term **energy conservation**.

(1)

.....

.....

(c) Identify one **non-renewable** source of energy.

(1)

☒	**A** hydroelectric power
☒	**B** wind power
☒	**C** solar power
☒	**D** burning natural gas

(d) Study Figure 1a in the Resource Booklet.

Suggest **one** reason for the choice of economic activity in this location.

(2)

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(e) State **one** example of primary employment.

(1)

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(f) Explain **two** ways that there is a link between population and resource consumption.

(4)

1 .....

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2 .....

(g) Study Figure 1b in the Resource Booklet.

Suggest **one** reason for the changes in manufacturing employment shown in Figure 1b.

(3)

(h) For a named megacity, explain **two** causes of informal employment.

(4)

Named megacity .....

1 .....

2 .....

(i) Study Figure 1c in the Resource Booklet.

Analyse the reasons for the past and predicted changes in the global energy mix.

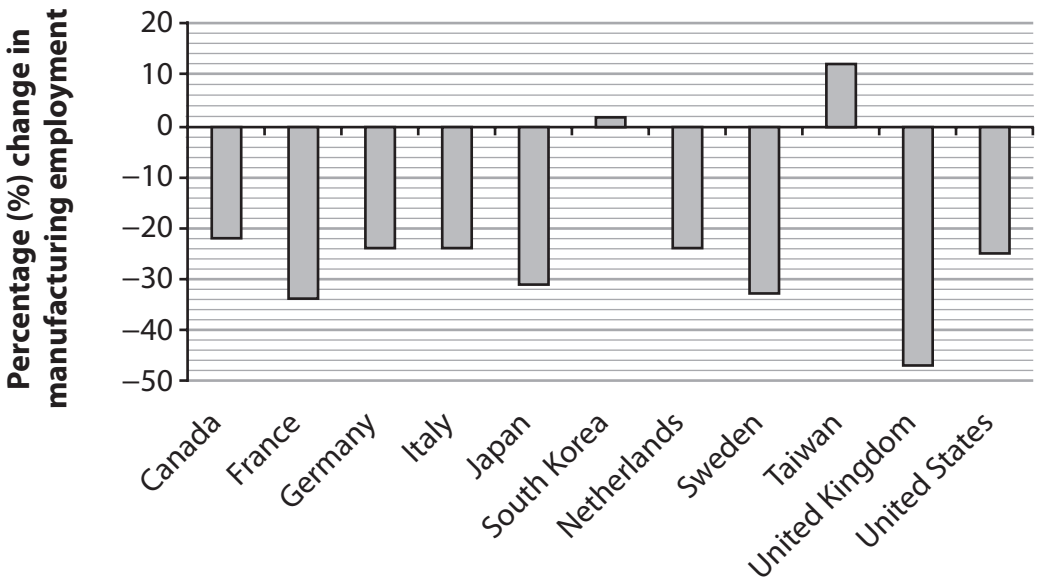
(8)



(Source: © David Holmes Geography)

Figure 1a

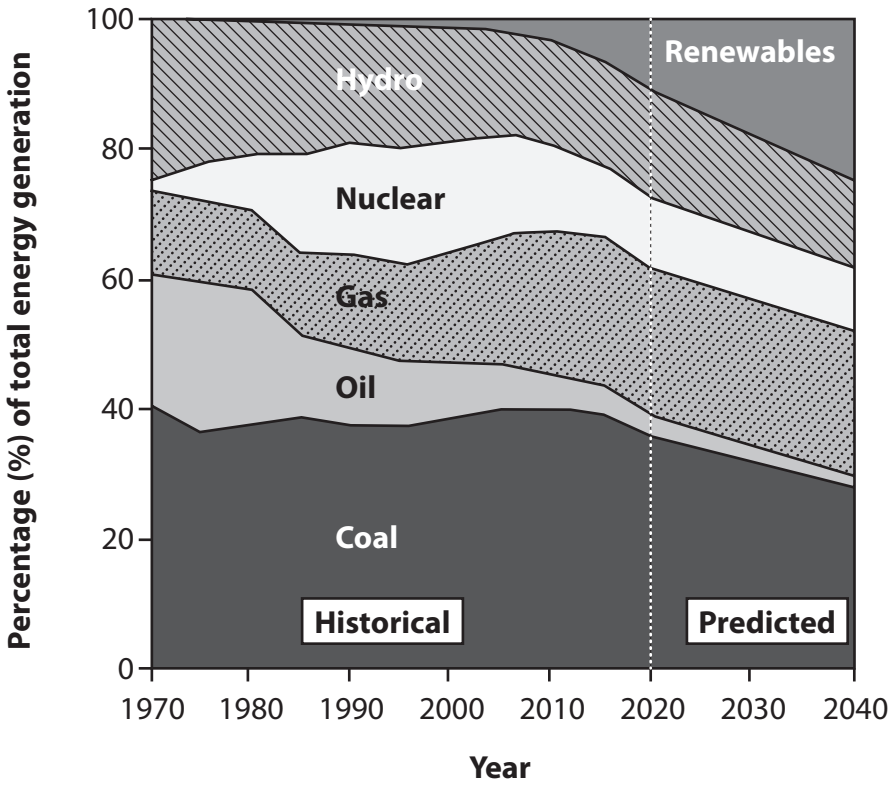
Barcelona Port – an example of a location of economic activity



(Source: https://fas.org/sgp/crs/misc/R42135.pdf)

Figure 1b

Percentage change in manufacturing employment in selected countries,1990–2016



(Source from: https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/energy-outlook/bp-energy-outlook-2018.pdf)

Figure 1c

Past and predicted changes in the global energy mix, 1970–2040

1 Economic activity and energy

(a) Identify the meaning of **shale gas**.

(1)

☒	**A** a gas that comes from underground coal mines
☒	**B** a gas that is emitted from the sun
☒	**C** natural gas that is trapped within shale formations
☒	**D** natural gas released from burning renewable energy resources

(b) Define the term **energy efficiency**.

(1)

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.....

(c) Identify **one** source of renewable energy.

(1)

☒	**A** hydroelectric power
☒	**B** coal
☒	**C** oil
☒	**D** natural gas

(d) Study Figure 1a in the Resource Booklet.

Suggest **one** reason for the change in population shown in Figure 1a.

(2)

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(e) State **one** example of secondary employment.

(1)

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(f) For a named megacity, explain **two** characteristics of informal employment.

(4)

Named megacity .....

1 .....

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2 .....

(g) Study Figure 1b in the Resource Booklet.

Suggest **one** advantage of the power source shown in Figure 1b.

(3)

(h) Explain **two** reasons why energy demand varies between countries.

(4)

1

2

(i) Study Figure 1c in the Resource Booklet.

Analyse the possible reasons for the changes in manufacturing employment.

(8)

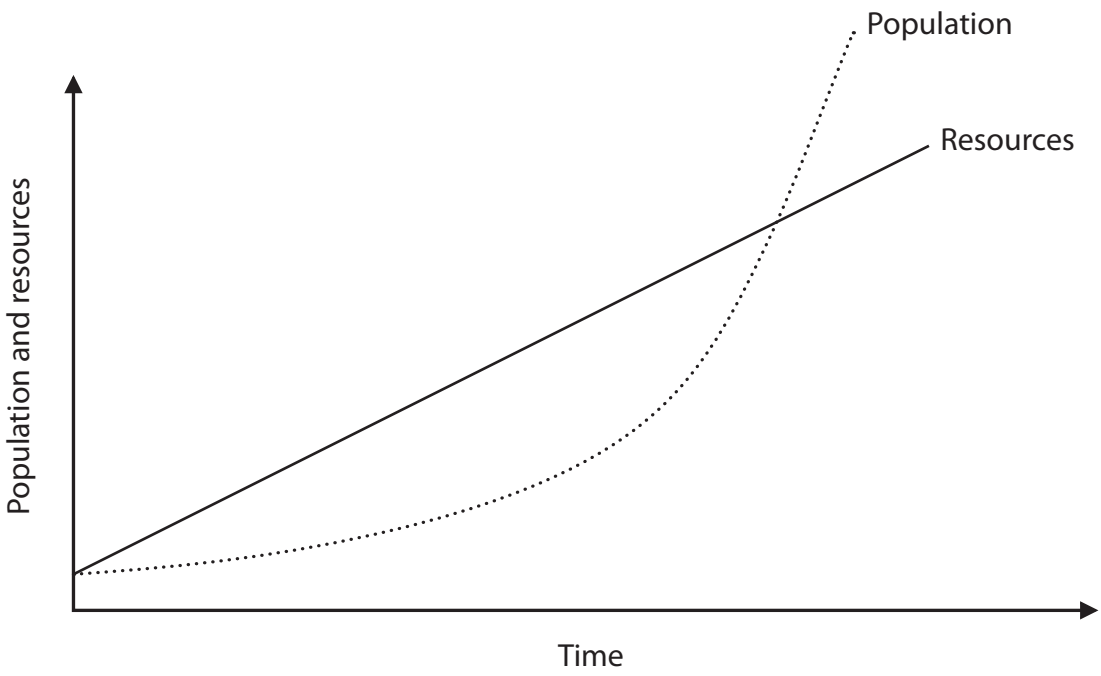


Figure 1a

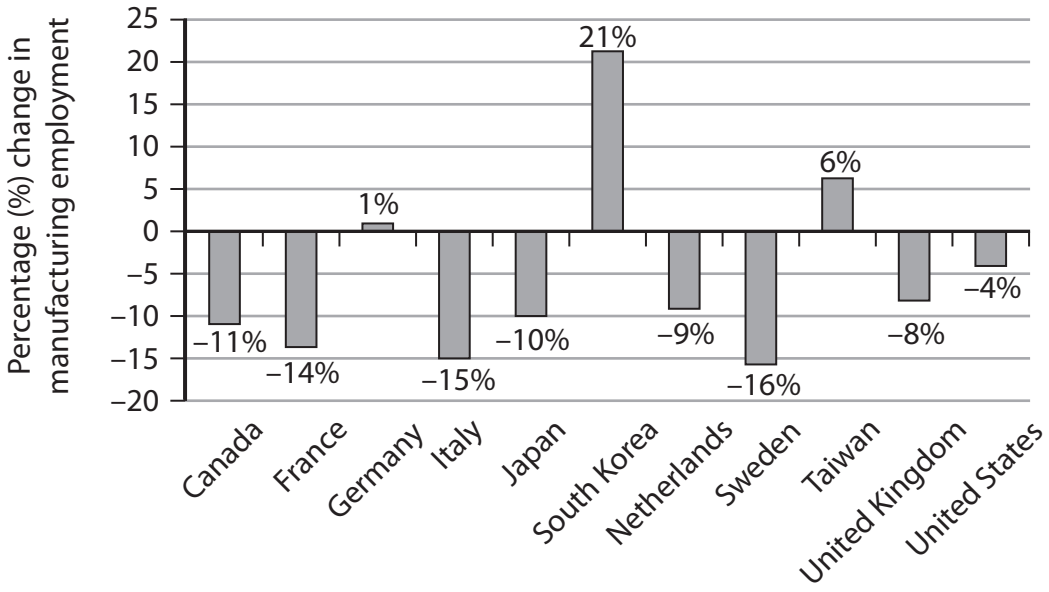
A population–resource relationship model



(Source: © David Holmes Geography)

Figure 1b

An example of an electricity power source



(Source: https://fas.org/sgp/crs/misc/R42135.pdf)

Figure 1c

Percentage (%) change in manufacturing employment in selected countries, 2008–2016

If you answer Question 1 put a cross in the box ☒

1 Economic activity and energy

(a) (i) Define the term **energy security**.

(1)

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(ii) Identify the **two** forms of non-renewable energy.

(2)

☒	**A** Coal
☒	**B** Hydroelectric
☒	**C** Geothermal
☒	**D** Oil
☒	**E** Solar
☒	**F** Wind

(b) Study Figure 1a in the Resource Booklet.

Suggest **one** way this house has been adapted to manage energy consumption.

(2)

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(c) (i) State **one** characteristic of the tertiary economic sector.

(1)

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(ii) Explain **two** factors that affect the location of tertiary sector activities.

(4)

1 .....

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2 .....

(d) Study Figure 1b below. It shows employment structures for selected countries in 1991 and 2018.

(i) Label the box with an X to show which pie chart displays the largest percentage for secondary sector employment.

(1)

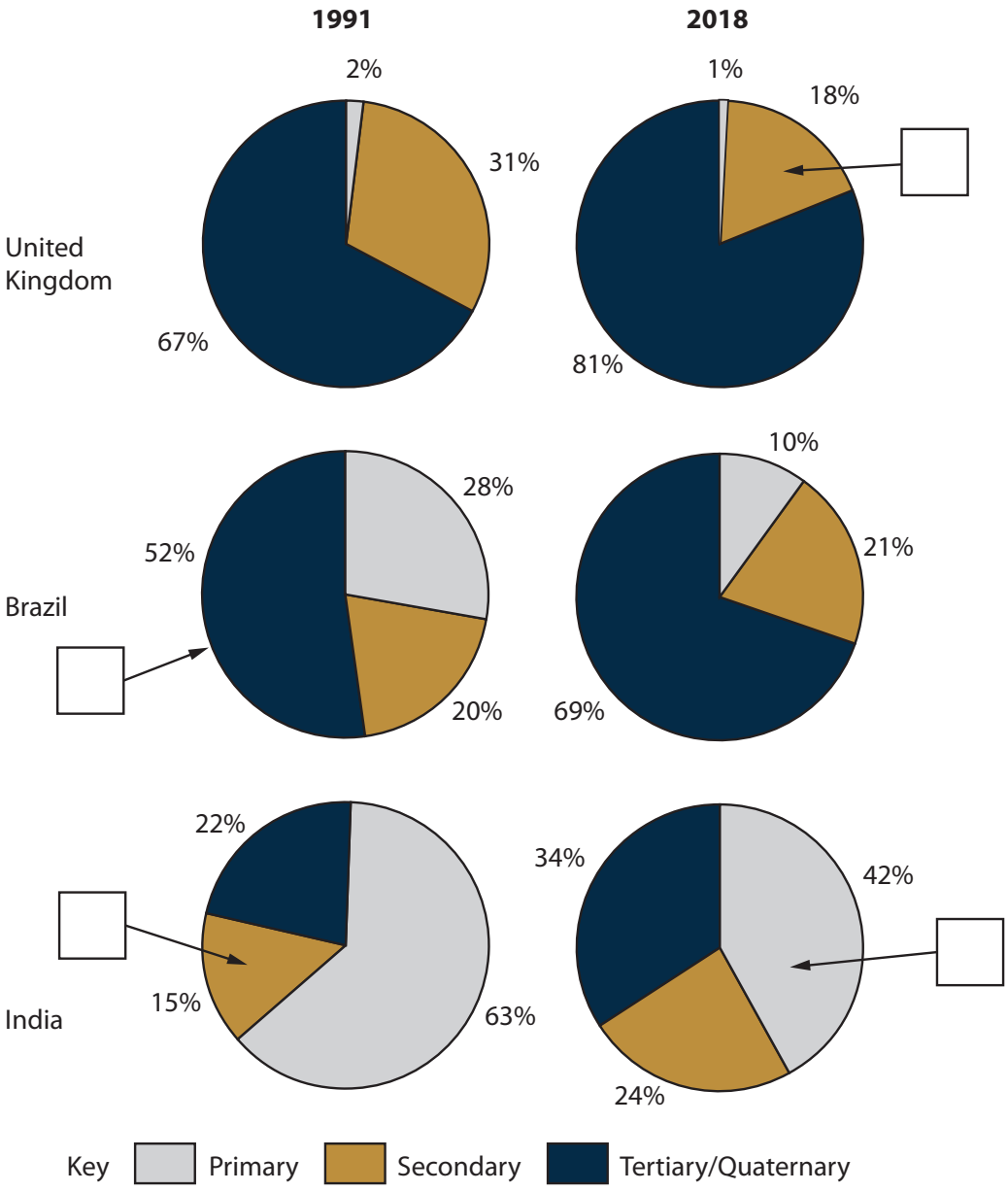


Figure 1b

Employment structures for selected countries in 1991 and 2018

(ii) Identify which **one** of the following is correct.

(1)

☒	**A** Brazil's employment in the tertiary/quaternary sectors has increased by 12 percentage points.
☒	**B** India's employment in tertiary/quaternary sectors has increased by 12 percentage points.
☒	**C** The UK's employment in the primary sector has decreased by 12 percentage points.
☒	**D** India's employment in the primary sector has decreased by 12 percentage points.

(iii) State **one** reason for decline in primary sector employment.

(1)

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(e) For a named megacity explain **two** advantages of informal employment.

(4)

Named megacity .....

1 .....

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2 .....

(f) Study Figure 1c in the Resource Booklet.

Analyse the possible reasons why energy consumption has grown.

(8)

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Figure 1a

Photograph of a house adapted for more sustainable energy consumption

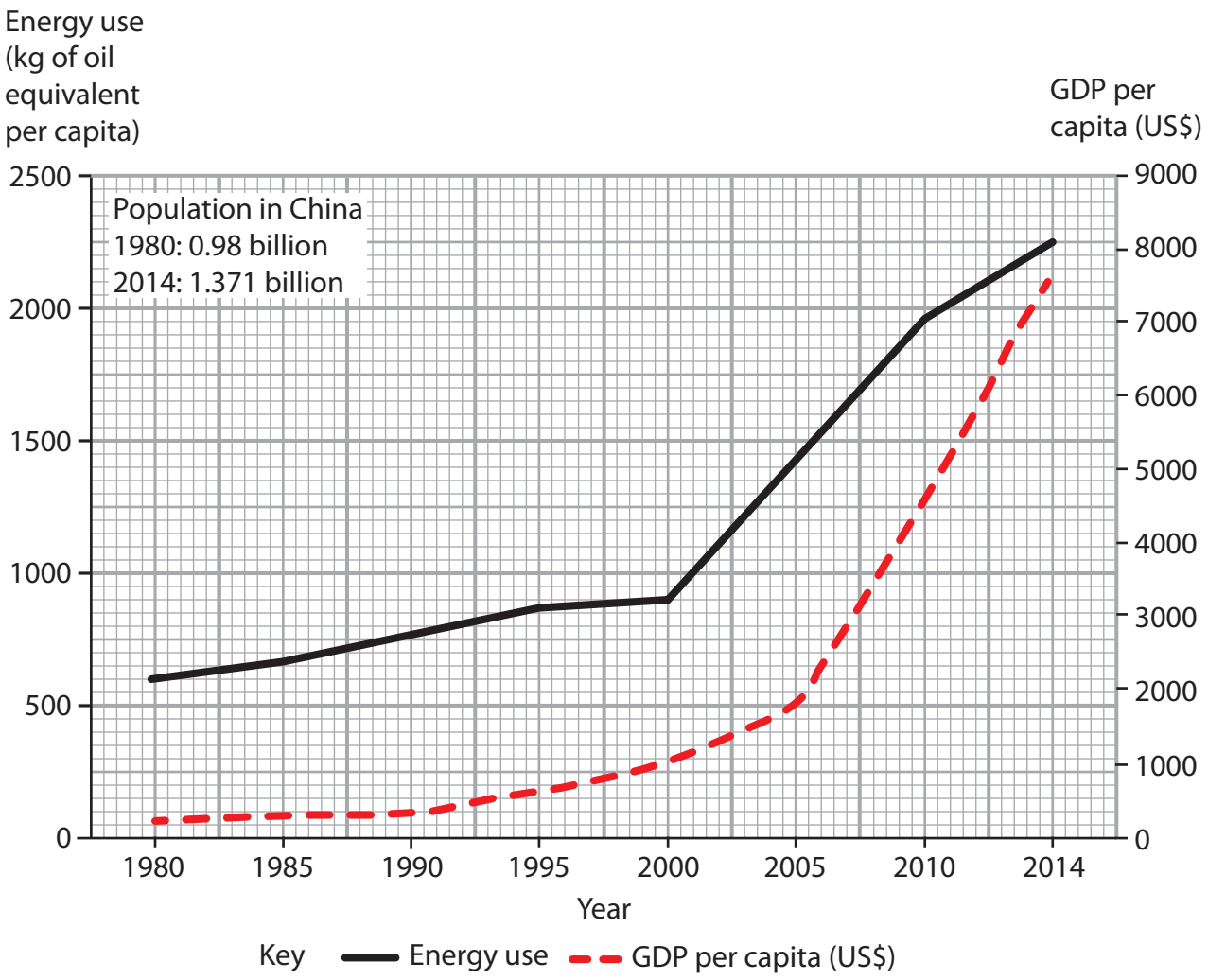


Figure 1c

Energy use and GDP per capita in China, 1980–2014

If you answer Question 1 put a cross in the box ☒

1 Economic activity and energy

(a) (i) Define the term **energy gap**.

(1)

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(ii) Identify the **two** forms of renewable energy.

(2)

☒	**A** Coal
☒	**B** Oil
☒	**C** Natural gas
☒	**D** Shale gas
☒	**E** Solar
☒	**F** Wind

(b) Study Figure 1a in the Resource Booklet.

Suggest **one** way this transport method is contributing to more sustainable energy use.

(2)

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(c) (i) State **one** factor that can affect the location of secondary industry.

(1)

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(ii) Explain **two** reasons why developed countries have a declining secondary sector.

(4)

1 .....

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(d) Study Figure 1b below. It shows changes in primary sector employment for selected countries.

(i) Label, with an X in the box, the country that has primary sector employment between 30–40% in 1991.

(1)

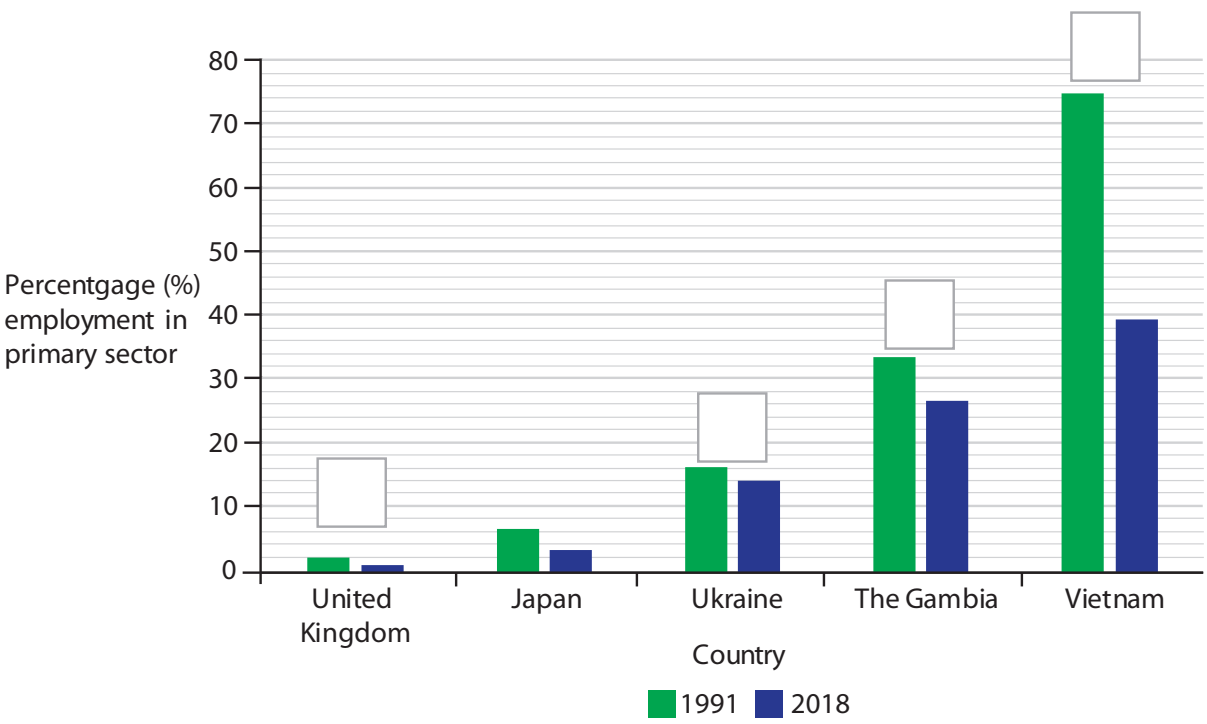


Figure 1b

Percentage (%) of people in primary sector employment for selected countries, 1991 and 2018

(ii) State which country has experienced the greatest change in primary sector employment.

(1)

☒	**A** The Gambia
☒	**B** Japan
☒	**C** Ukraine
☒	**D** Vietnam

(iii) State **one** factor that can cause a decline in primary sector employment.

(1)

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(e) For a named megacity explain **two** disadvantages of informal employment.

(4)

Named megacity .....

1 .....

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2 .....

(f) Study Figure 1c in the Resource Booklet.

Analyse the reasons why energy production has changed.

(8)

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Figure 1a

Photograph of an electric bus

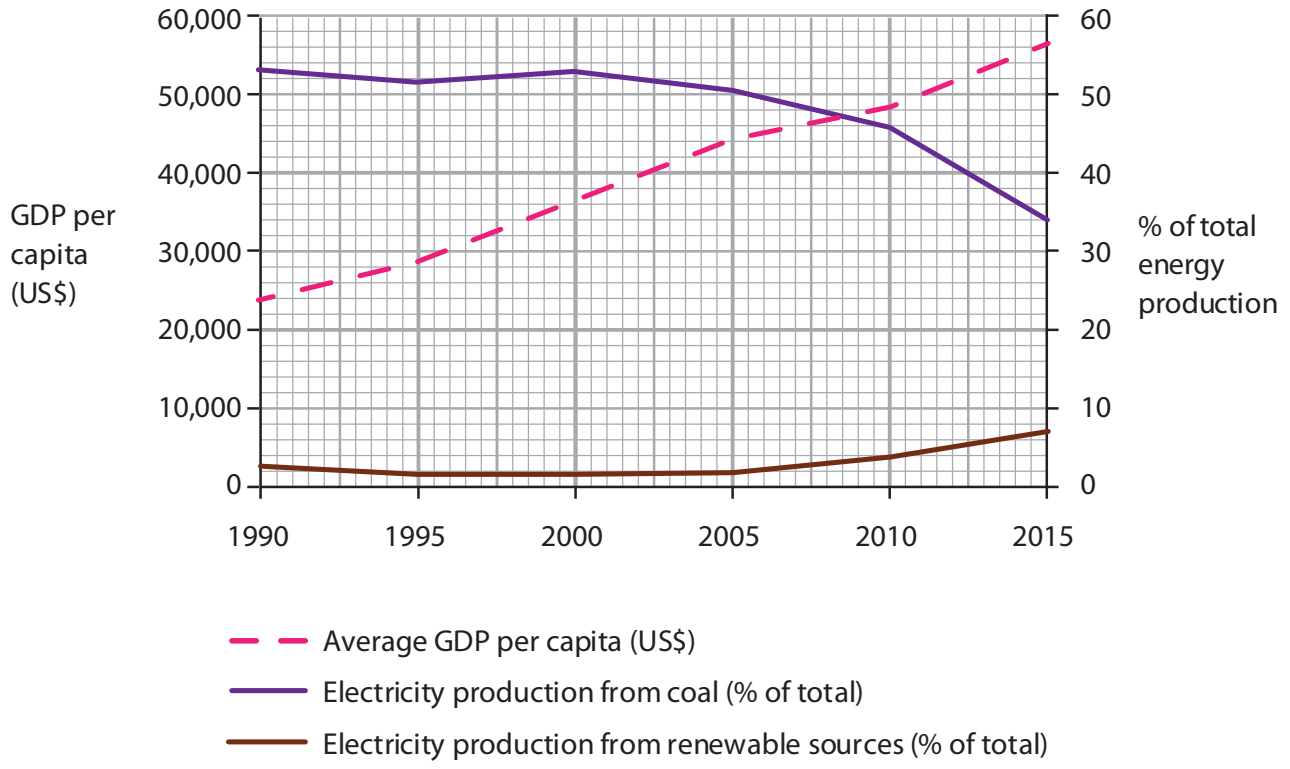


Figure 1c

Global average Gross Domestic Product (GDP) per capita, electricity production from coal and renewable sources, 1990–2015



Figure 1a

Photograph of an electric bus

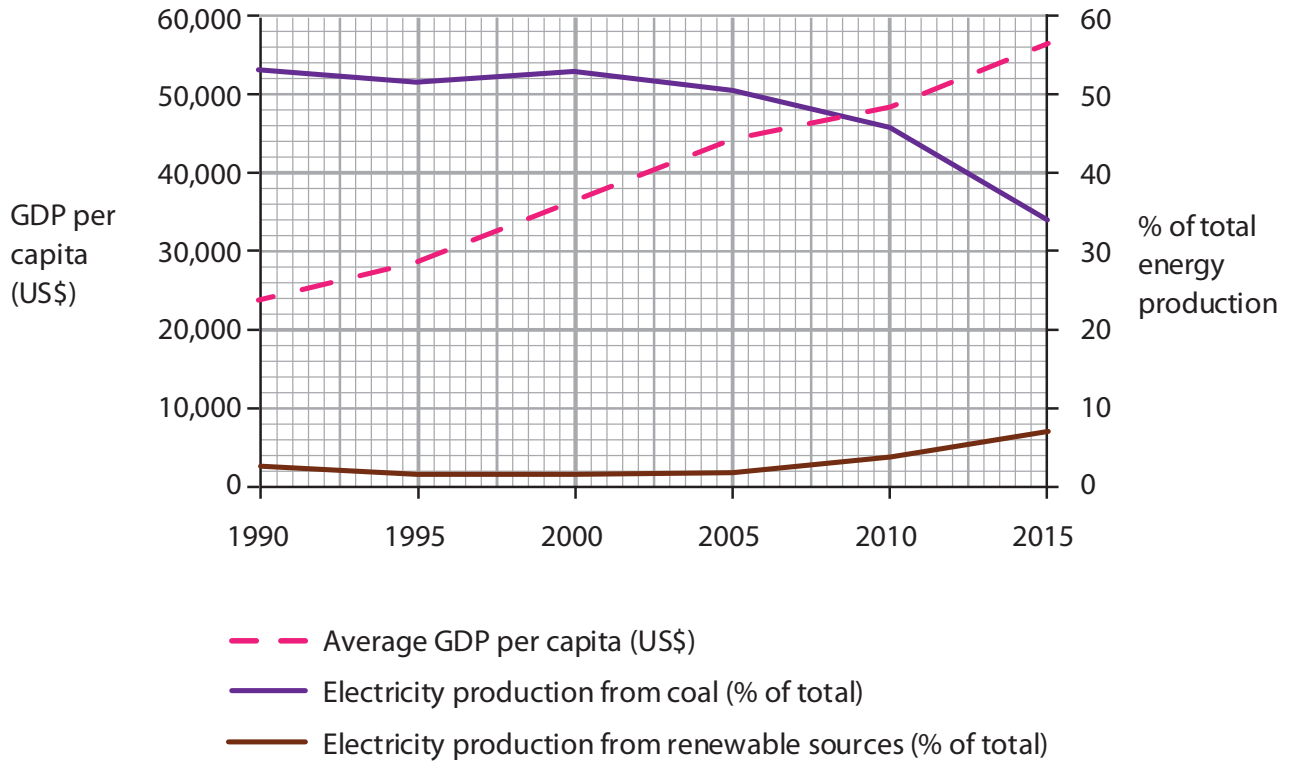


Figure 1c

Global average Gross Domestic Product (GDP) per capita, electricity production from coal and renewable sources, 1990–2015

If you answer Question 1 put a cross in the box ☒

1 Economic activity and energy

(a) (i) Identify **one** advantage of using geothermal energy as a source of energy.

(1)

- ☒ **A** It uses the power of the sun.
- ☒ **B** It uses the power of the wind.
- ☒ **C** It is a type of non-renewable energy.
- ☒ **D** It is a type of renewable energy.

(ii) Define the term **renewable energy**.

(1)

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(b) Identify **one** way to make transport more sustainable.

(1)

- ☒ **A** increasing the use of powerful petrol engines.
- ☒ **B** increasing air travel routes.
- ☒ **C** increasing the use of electric battery technology.
- ☒ **D** increasing the size of motorways.

(c) (i) Study Figure 1a in the Resource Booklet.

Suggest **one** reason why the activity shown might be considered informal employment.

(2)

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(ii) State **one** advantage of informal employment.

(1)

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(d) Explain **two** factors that affect global energy demand.

(4)

1 .....

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2 .....

(e) Study Figure 1b in the Resource Booklet.

Explain the relationship shown between population growth and food supply.

(3)

(f) Explain **two** factors that affect the location of quaternary sector employment.

(4)

1

2

(g) Study Figure 1c in the Resource Booklet.

Analyse the reasons for the changes in the percentage of people employed in the secondary sector.

(8)



Figure 1a

Informal employment in Kolkata, India

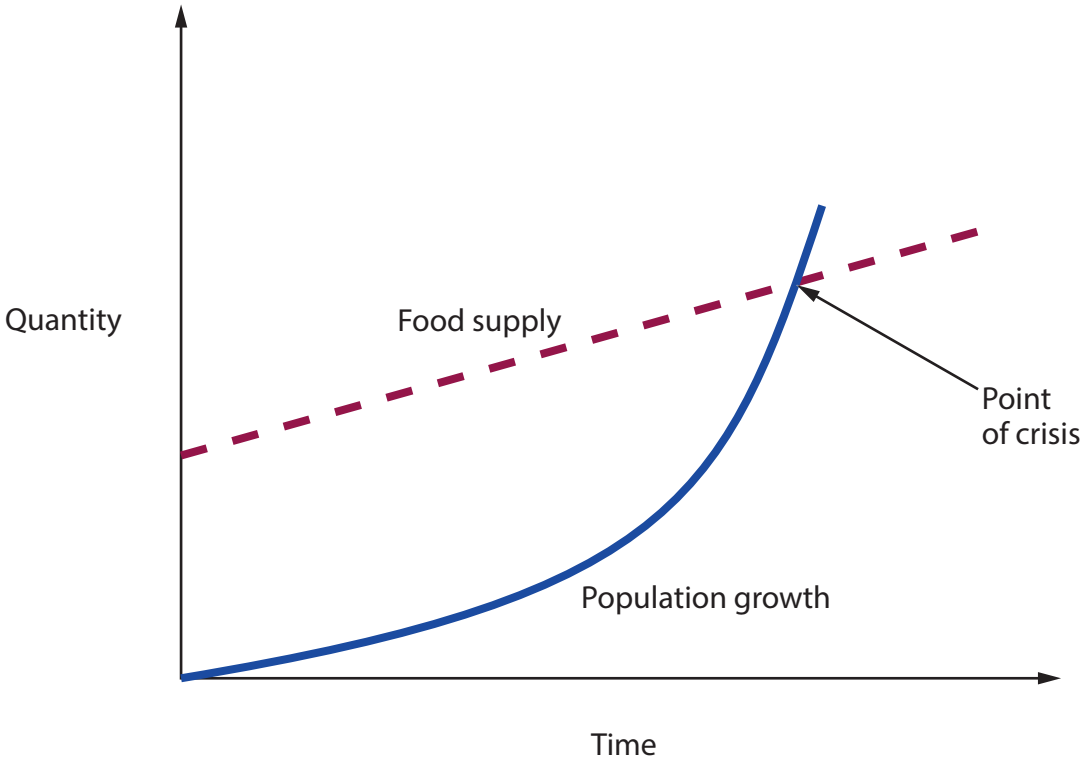


Figure 1b

Malthus' theory of population growth and food supply over time

If you answer Question 1 put a cross in the box ☒

1 Economic activity and energy

(a) (i) Identify **one** disadvantage of using natural gas as a source of energy.

(1)

- ☒ **A** There is an infinite supply.
- ☒ **B** It is easy to export.
- ☒ **C** It is a renewable energy source.
- ☒ **D** Burning it releases CO_2.

(ii) Define the term **non-renewable energy**.

(1)

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(b) Identify **one** way to make a factory more sustainable.

(1)

- ☒ **A** Increase the factory size.
- ☒ **B** Increase the number of vehicles used to transport goods.
- ☒ **C** Use more packaging for goods produced.
- ☒ **D** Use more renewable energy.

(c) (i) Study Figure 1a in the Resource Booklet.

Suggest **one** reason why this might be considered primary sector employment.

(2)

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(ii) Name **one** raw material produced in the primary sector.

(1)

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(d) Explain **two** factors that affect global energy production.

(4)

1 .....

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2 .....

(e) Study Figure 1b in the Resource Booklet.

Explain the relationship shown between population growth and food supply.

(3)

(f) Explain **two** factors that affect the location of secondary sector industries.

(4)

1

2

(g) Study Figure 1c in the Resource Booklet.

Analyse the reasons for the differences in the percentage of people employed in the tertiary sector.

(8)



Figure 1a

Primary sector employment in Vietnam

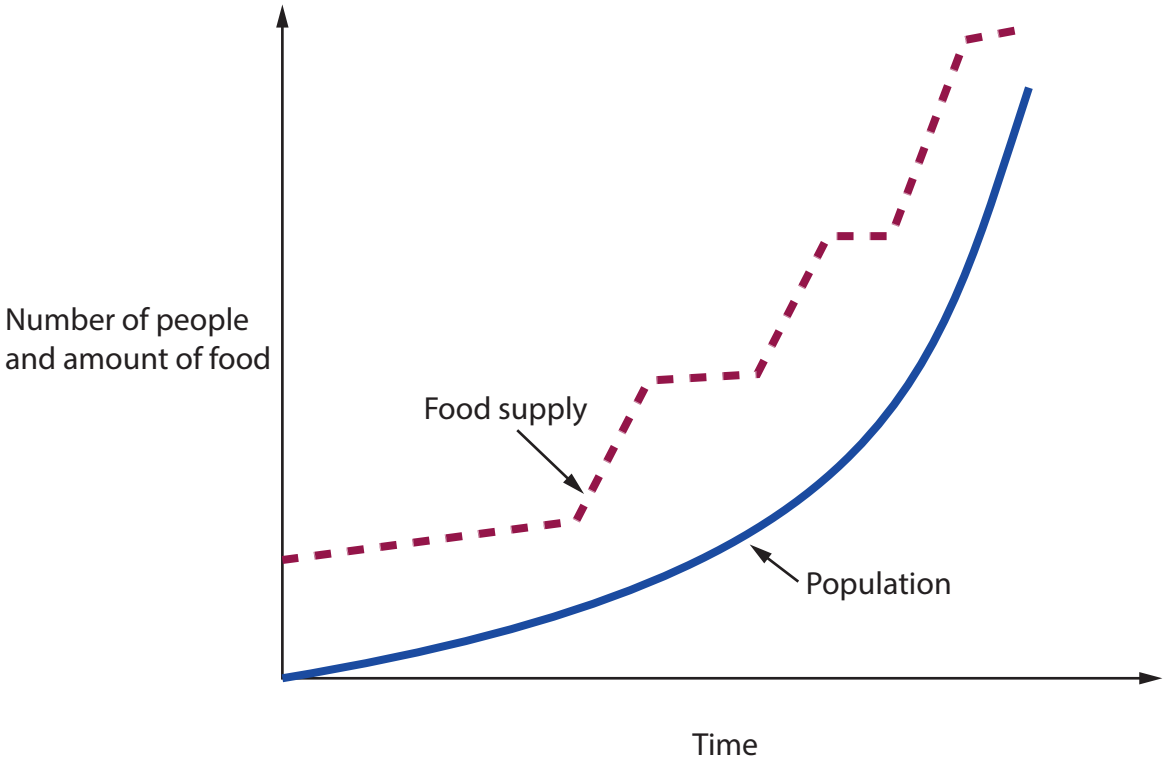


Figure 1b

Boserup's approach to population growth and food supply

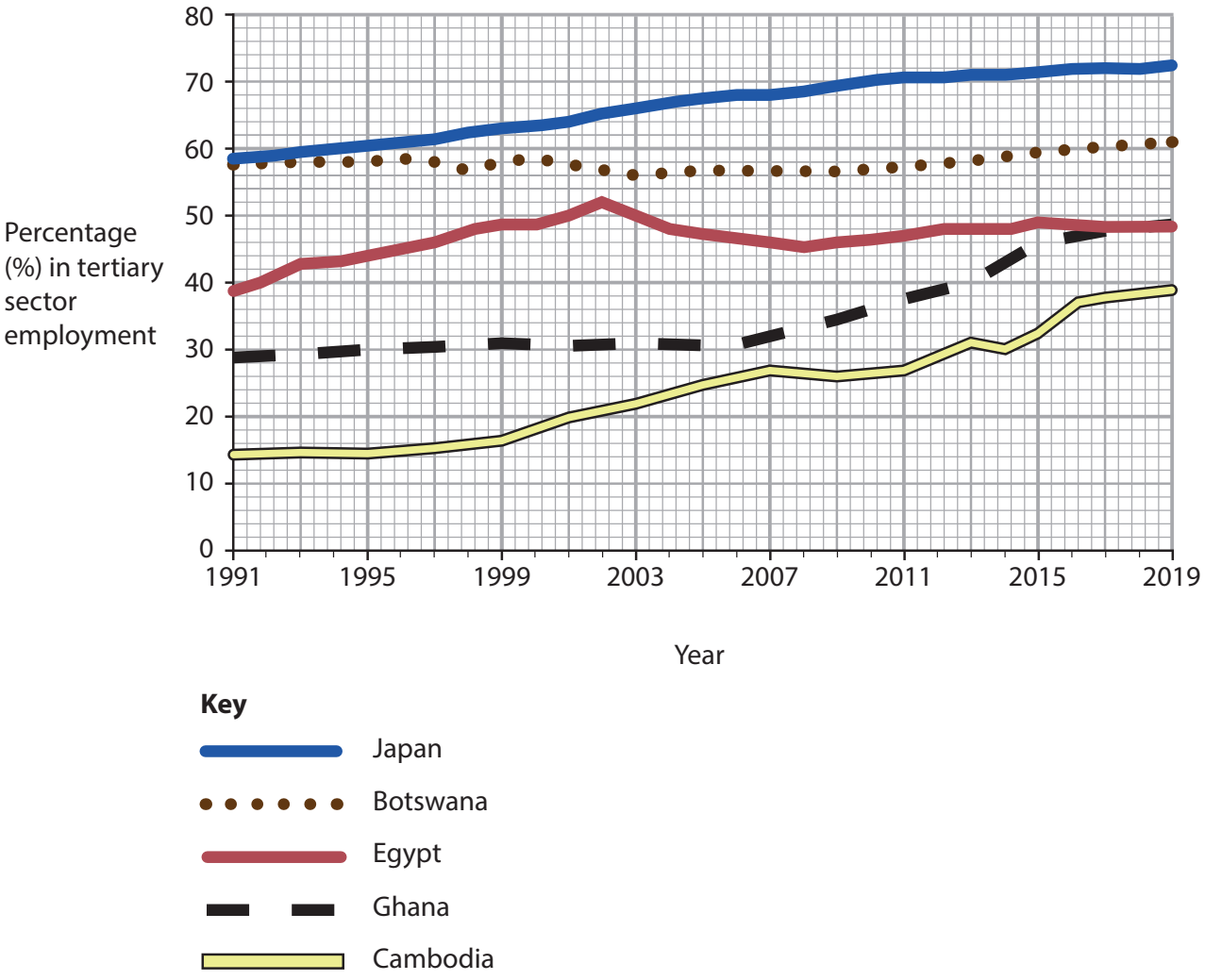


Figure 1c

Percentage (%) in tertiary sector employment in selected countries, 1991–2019

If you answer Question 1, put a cross in the box ☒

1 Economic activity and energy

(a) (i) Identify **one** advantage of using solar energy.

(1)

- ☒ **A** Many turbines are needed.
- ☒ **B** Could also protect coastlines from erosion.
- ☒ **C** Can be used in most areas of the world.
- ☒ **D** The waste can be recycled.

(ii) Define the term **geothermal energy**.

(1)

.....

.....

(b) Identify the correct definition of the term **energy gap**.

(1)

- ☒ **A** The difference between renewable and non-renewable energy use.
- ☒ **B** The difference between a country's energy demand and its ability to produce it.
- ☒ **C** The difference between production of energy ten years ago and today.
- ☒ **D** The difference between energy imports and population growth.

(c) Study Figure 1a in the Resource Booklet.

Suggest **one** factor that has influenced the location of this factory.

(2)

(d) State **one** economic activity that is part of the primary sector.

(1)

(e) Study Figure 1b in the Resource Booklet.

Suggest **one** possible reason for changes to secondary sector employment.

(3)

(f) Explain **one** advantage and **one** disadvantage of using non-renewable energy sources.

(4)

Advantage

Disadvantage

(g) For a named developed country, explain **two** ways it has tried to increase energy security.

(4)

Named developed country

1

(h) Study Figure 1c in the Resource Booklet.

Analyse the reasons for the patterns of informal employment.

Refer to the resource in your answer.

(8)



Figure 1a

A cement factory in Norway

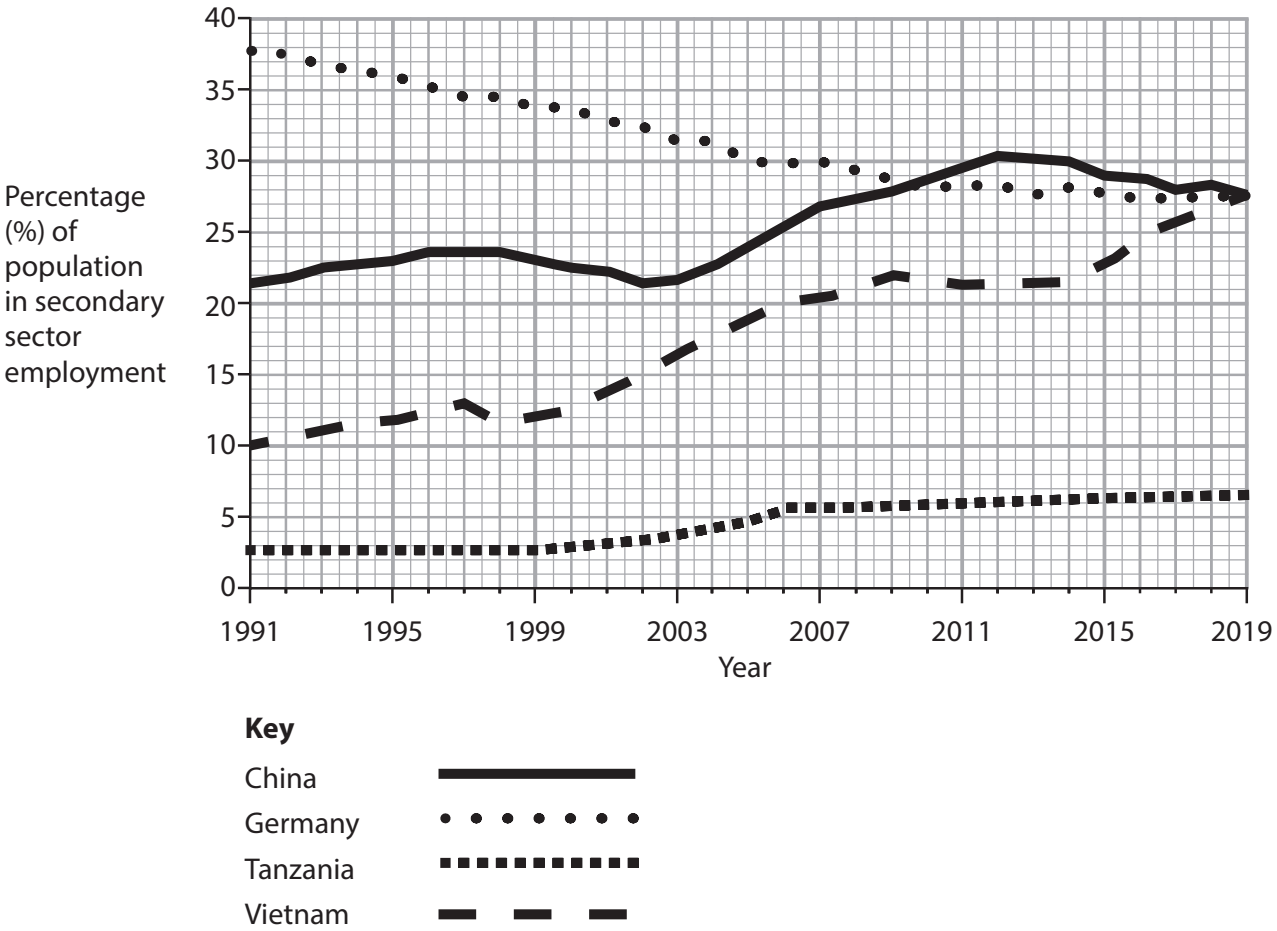


Figure 1b

Percentage (%) of population in secondary sector employment in selected countries, 1991–2019

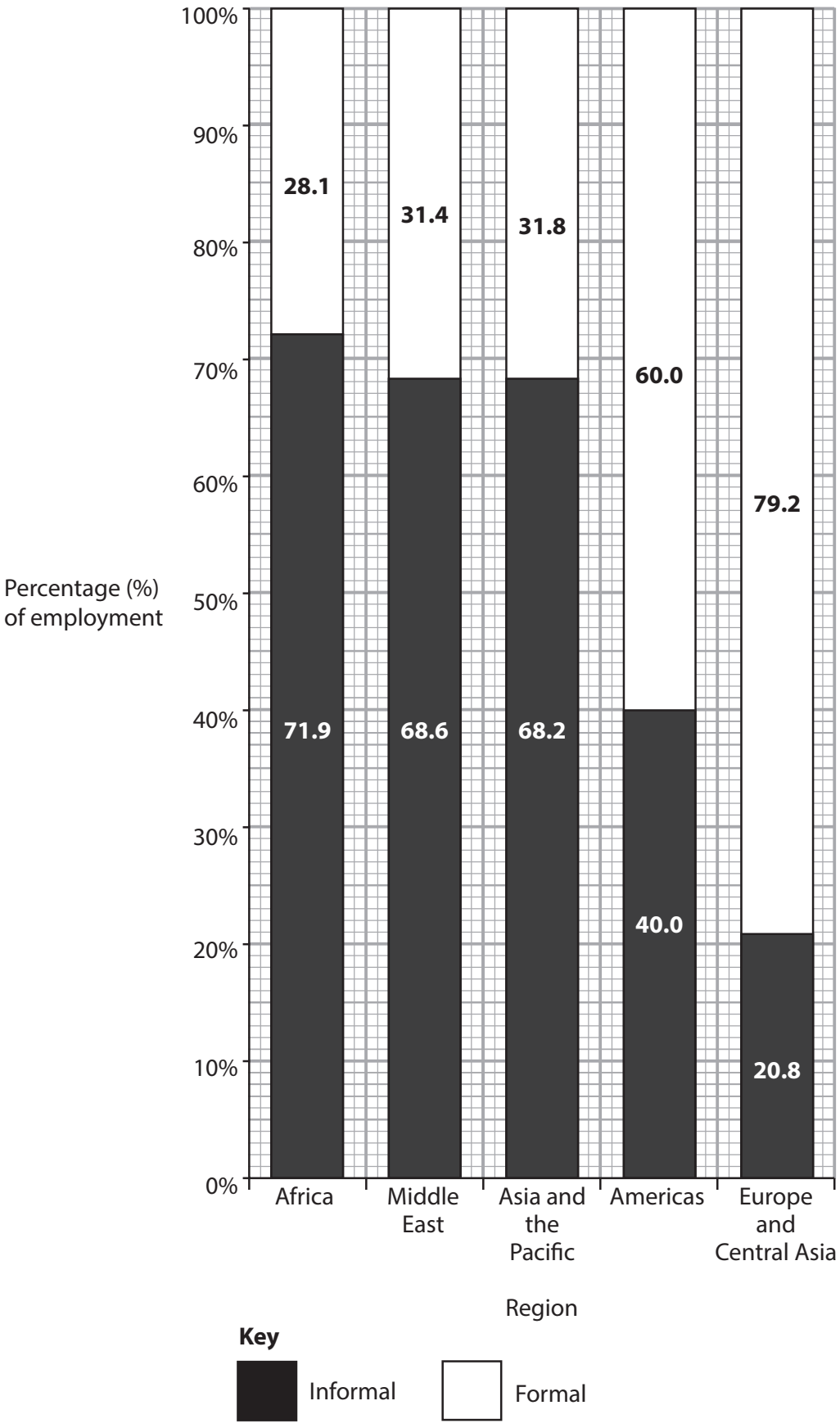


Figure 1c

Percentage (%) of informal and formal employment for selected regions, 2018

If you answer Question 1, put a cross in the box ☒.

1 Economic activity and energy

(a) (i) Identify **one** type of employment associated with the primary sector.

(1)

- ☒ **A** doctor
- ☒ **B** computer engineer
- ☒ **C** miner
- ☒ **D** teacher

(ii) State **one** factor that affects the location of primary sector economic activity.

(1)

.....

.....

(b) Identify a characteristic of informal employment.

(1)

- ☒ **A** reliable income
- ☒ **B** consistent income
- ☒ **C** lack of access to a retail park
- ☒ **D** lack of unemployment benefits

(c) Study Figure 1a in the Resource Booklet.

Suggest **one** factor that has affected the location of this business park.

(2)

.....

.....

.....

.....

(d) Define the term **energy gap**.

(1)

(e) For a named developing or emerging country, explain **two** ways energy can be managed sustainably.

(4)

Named developing or emerging country

1

2

(f) Study Figure 1b in the Resource Booklet.

Suggest **one** possible reason for a change in the energy mix shown.

(3)

(g) Explain **one** advantage and **one** disadvantage of using renewable energy sources.

(4)

Advantage

Disadvantage

(h) Study Figure 1c in the Resource Booklet.

Analyse reasons for changes in the employment sectors shown.

Refer to the resource in your answer.

(8)



(Source: © KiwiK/Shutterstock)

Figure 1a

A business park in the Netherlands

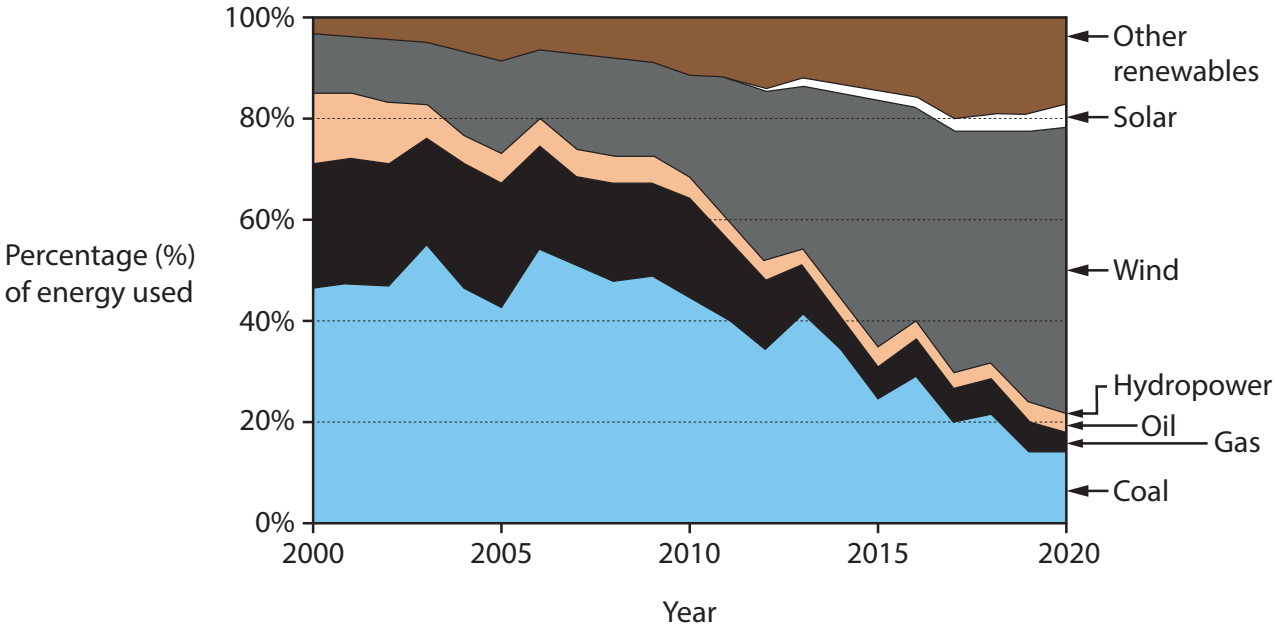
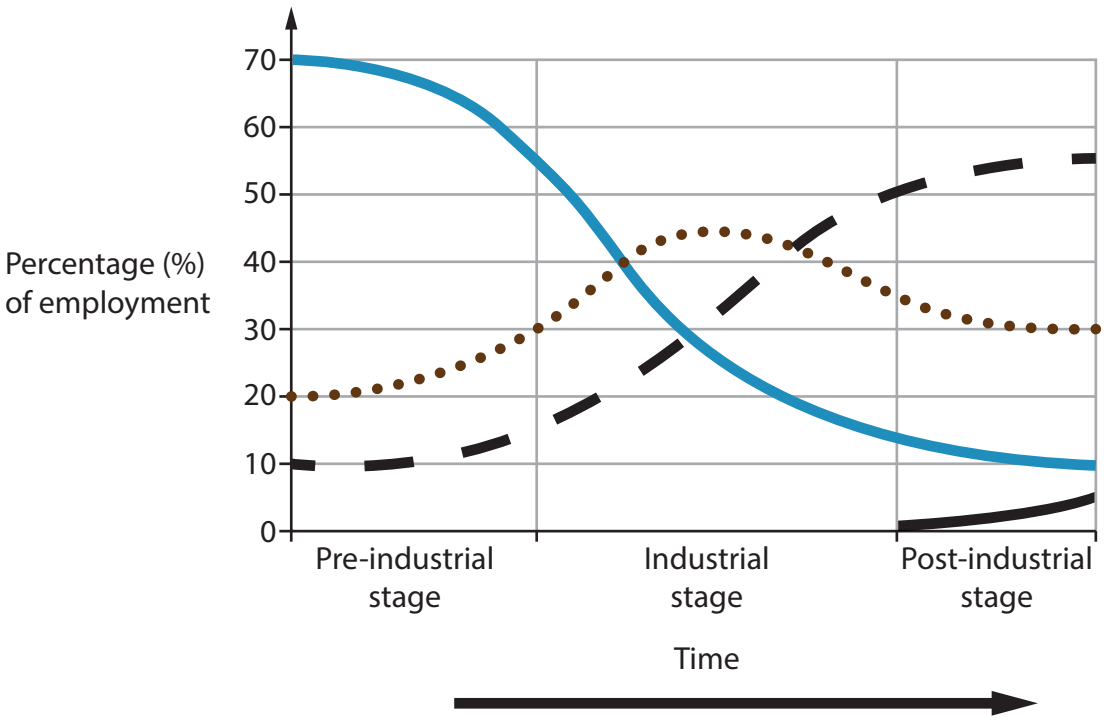


Figure 1b

Energy mix in Denmark, 2000–2020



Key: Employment sector

- Primary
- Secondary
- Tertiary
- Quaternary

Figure 1c

Clark-Fisher model

If you answer Question 1, put a cross in the box ☒.

1 Economic activity and energy

(a) (i) Identify **one** factor that affects the location of primary industry.

(1)

- ☒ **A** access to areas with low air pollution
- ☒ **B** access to large car parks
- ☒ **C** access to sports facilities
- ☒ **D** access to road network

(ii) State **one** example of a quaternary sector industry.

(1)

.....

(b) Identify **one** impact of a shift from a primary industry (agriculture) to secondary industries.

(1)

- ☒ **A** ageing rural populations
- ☒ **B** ageing urban populations
- ☒ **C** growth in rural areas
- ☒ **D** growth in rural services

(c) Study Figure 1a in the Resource Booklet which shows information about employment structure for selected countries.

Suggest **one** reason for the difference in employment structure.

(2)

.....

.....

.....

.....

(d) State what is shown by the Clark Fisher model.

(1)

(e) For a named megacity, explain **one** advantage and **one** disadvantage of informal employment.

(4)

Named megacity

Advantage

Disadvantage

(f) Study Figure 1b in the Resource Booklet which shows energy consumption in Europe.

Suggest **one** possible reason for the differences in energy consumption.

(3)

(g) Explain **two** environmental impacts of using non-renewable energy sources.

(4)

1 .....

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2 .....

(h) Study Figure 1c in the Resource Booklet.

Analyse the ways to make energy use more sustainable.

Refer to the resource in your answer.

(8)

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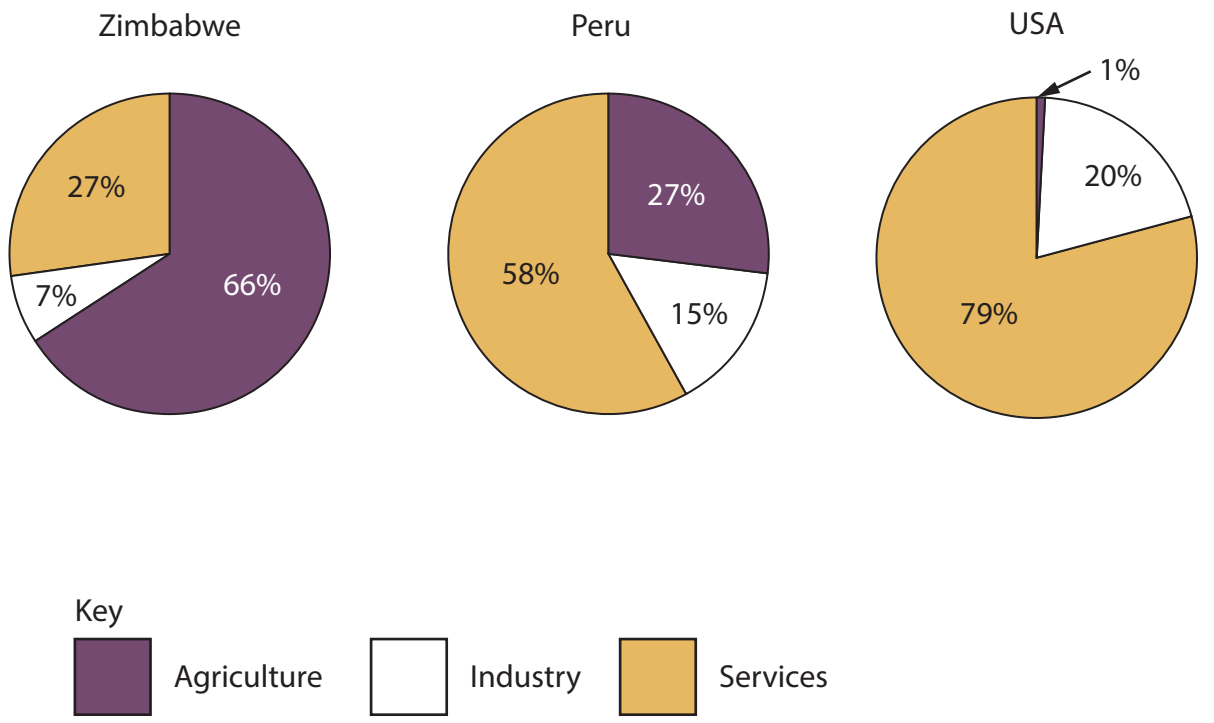
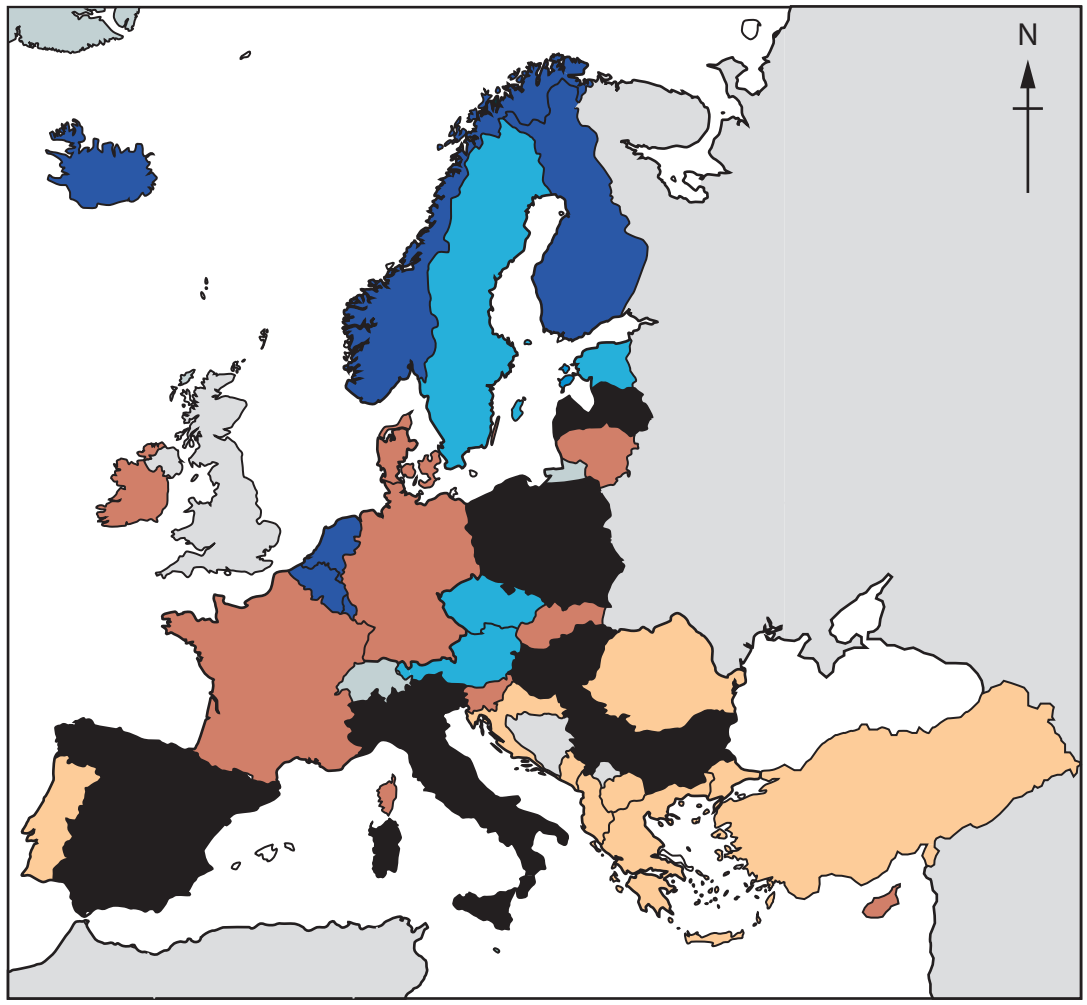


Figure 1a

Employment structure in selected countries



Key: Energy consumption per capita, terajoules

- <90
- 90 – <115
- 115 – <150
- 150 – <200
- ⩽200
- Data not available

Figure 1b

Energy consumption intensity in the European Union, 2022

What can you do to reduce your carbon footprint?

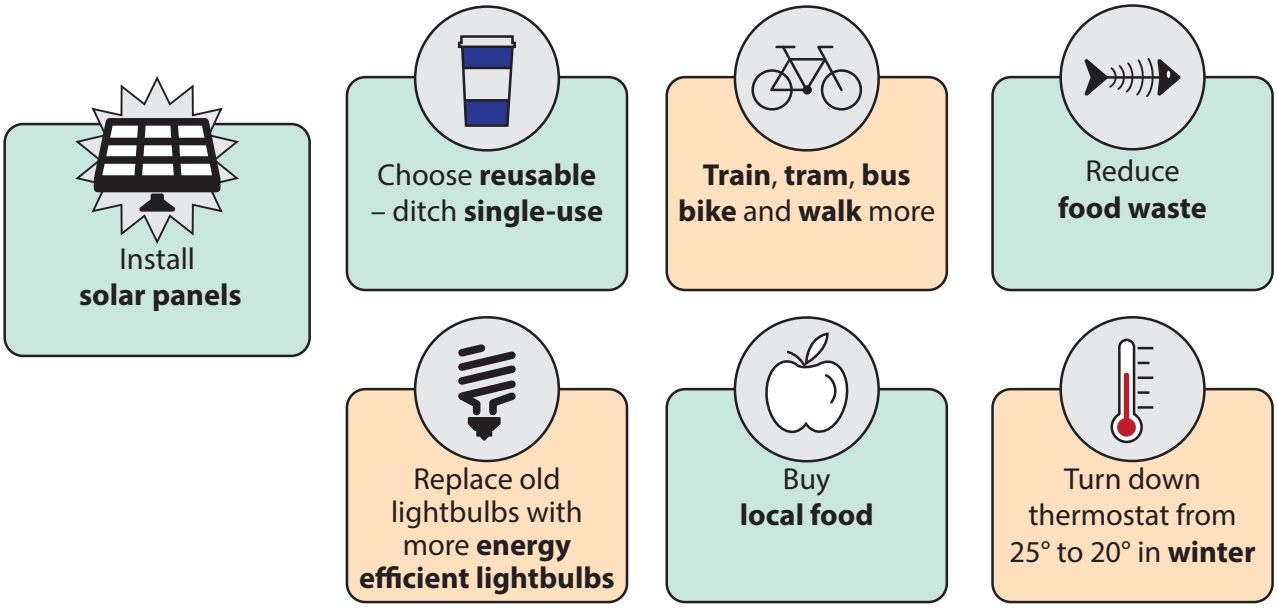


Figure 1c

Efforts to make energy use more sustainable

If you answer Question 1, put a cross in the box ☒.

1 Economic activity and energy

(a) Identify which employment sector a school teacher belongs to.

(1)

- ☒ **A** primary
- ☒ **B** secondary
- ☒ **C** tertiary
- ☒ **D** quaternary

(b) (i) Identify **one** cause of employment in the informal sector.

(1)

- ☒ **A** access to pensions
- ☒ **B** lack of qualifications
- ☒ **C** population decline
- ☒ **D** reliable income

(ii) State **one** job that can be found in the informal sector.

(1)

.....

(c) Study Figure 1a in the Resource Booklet.

Suggest **one** reason why the activities shown are part of the primary sector.

(2)

.....

.....

.....

.....

(d) State **one** reason for a decline in employment in the primary sector in many countries.

(1)

(e) For a named developing or emerging country, explain **one** positive and **one** negative impact of an economic sector shift.

(4)

Named developing or emerging country

Positive

Negative

(f) Study Figure 1b in the Resource Booklet.

Suggest **one** possible reason for a trend in the levels of investment shown.

(3)

(g) Explain **one** advantage and **one** disadvantage of using hydroelectric power (HEP) to generate electricity.

(4)

Advantage

Disadvantage

(h) Study Figure 1c in the Resource Booklet.

Analyse the reasons for differences in the energy mix of these two regions.

You **must** refer to the resource in your answer.

(8)



Figure 1a

Activities in the primary sector

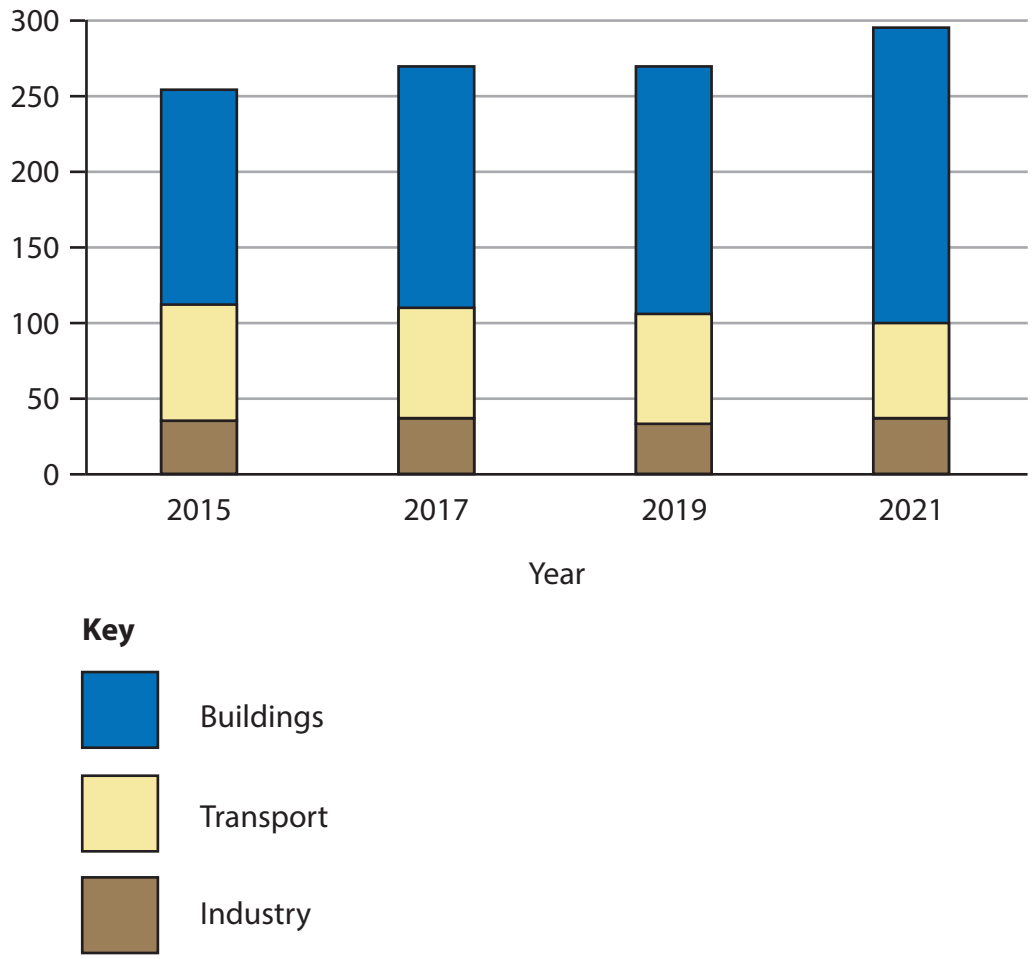
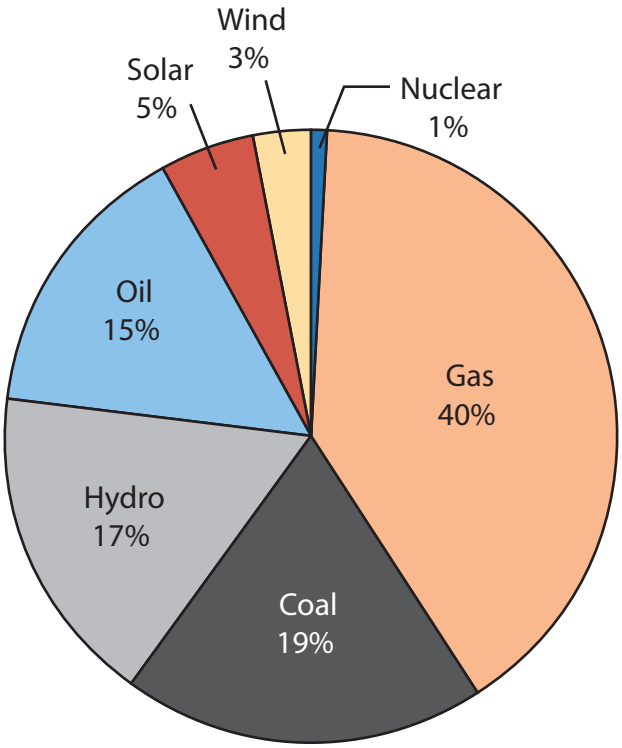
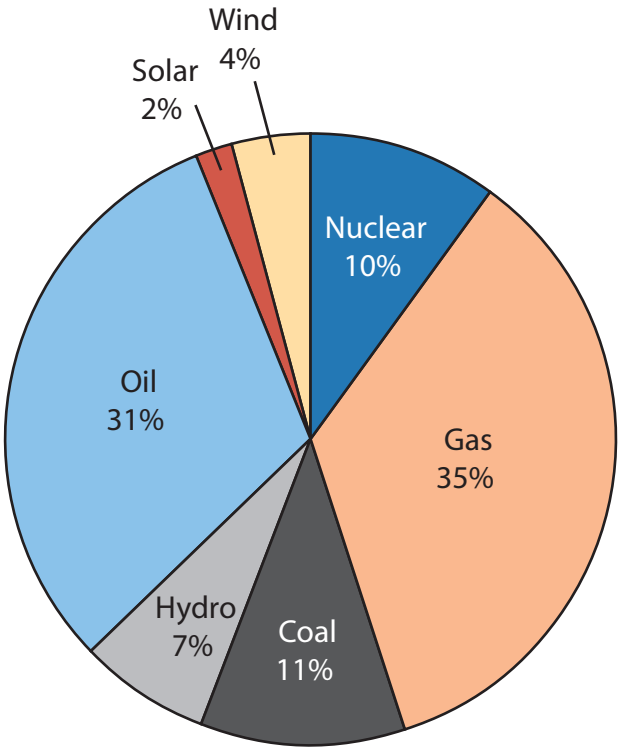


Figure 1b

Global investment in energy efficiency, 2015–2021



Africa



European Union

Figure 1c

Energy mix in Africa and the European Union, 2020

If you answer Question 1, put a cross in the box ☒.

1 Economic activity and energy

(a) (i) Identify **one** cause of informal employment.

(1)

- ☒ **A** lack of airport facilities
- ☒ **B** lack of air pollution
- ☒ **C** lack of brownfield sites
- ☒ **D** lack of education

(ii) State **one** advantage of informal employment.

(1)

.....

.....

(b) Identify which employment sector a research scientist would belong to.

(1)

- ☒ **A** primary
- ☒ **B** secondary
- ☒ **C** tertiary
- ☒ **D** quaternary

(c) Study Figure 1a in the Resource Booklet.

Suggest **one** reason this is considered a secondary sector industry.

(2)

.....

.....

.....

.....

(d) State **one** reason for a growth in tertiary sector employment in many countries.

(1)

(e) For a named developed country, explain **one** positive and **one** negative impact of an economic sector shift.

(4)

Developed country

Positive

Negative

(f) Study Figure 1b in the Resource Booklet.

Suggest **one** possible reason for a change in the levels of investment shown.

(3)

(g) Explain **one** advantage and **one** disadvantage of using solar panels to generate electricity.

(4)

Advantage

Disadvantage

(h) Study Figure 1c in the Resource Booklet.

Analyse the possible reasons for changes in global energy consumption.

You **must** refer to the resource in your answer.

(8)



Figure 1a

Activities in the secondary sector

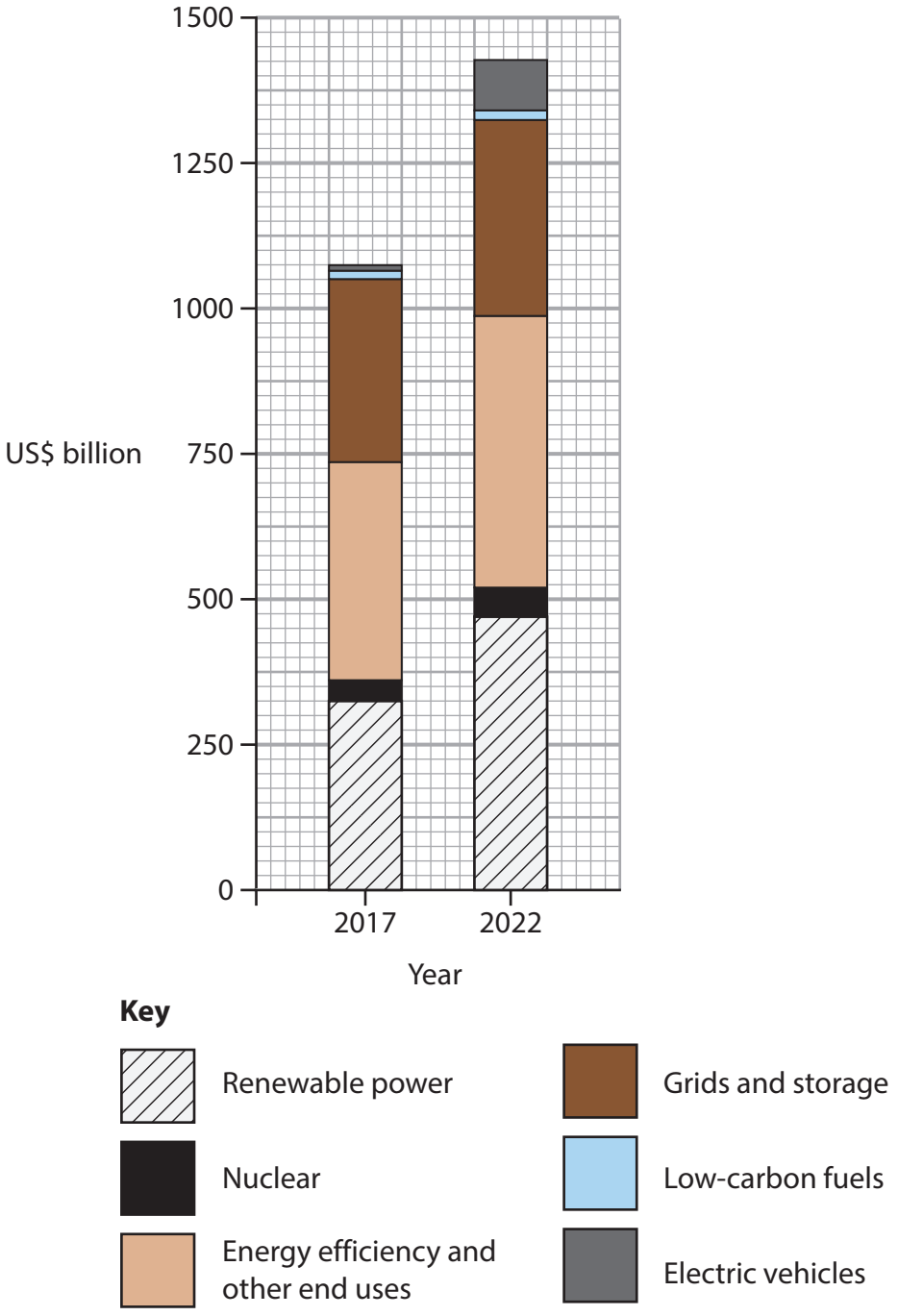


Figure 1b

Global investment in sustainable energy, 2017 and 2022

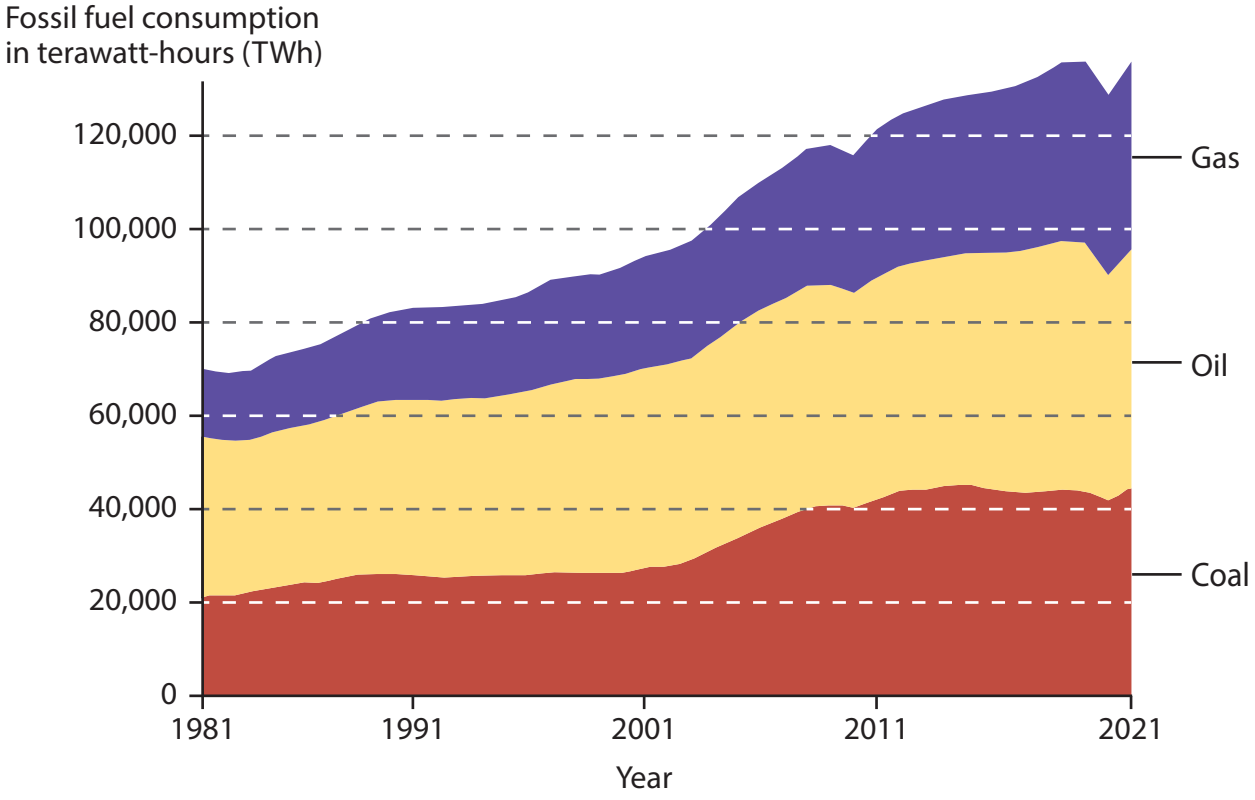


Figure 1c

Global energy consumption from fossil fuels, 1981–2021

If you answer Question 1, put a cross in the box ☒.

1 Economic activity and energy

(a) (i) Identify **one** source of renewable energy.

(1)

- ☒ **A** coal
- ☒ **B** gas
- ☒ **C** oil
- ☒ **D** wind

(ii) State **one** advantage of using renewable energy.

(1)

.....

(b) Identify **one** disadvantage of using shale gas as an energy source.

(1)

- ☒ **A** fracking is cheap
- ☒ **B** groundwater pollution
- ☒ **C** refills water reservoirs
- ☒ **D** supports biodiversity

(c) Study Figure 1a in the Resource Booklet.

Suggest **one** way these factories could become more sustainable.

(2)

.....

.....

.....

.....

(d) State **one** factor that has increased global demand for energy.

(1)

(e) Explain **one** human and **one** physical factor that can affect the location of primary sector activities.

(4)

human

physical

(f) Study Figure 1b in the Resource Booklet.

Suggest **one** possible reason for the distribution shown.

(3)

(g) Thomas Malthus developed a theory about the relationship between population and resources.

Explain **two** of the ideas from this theory.

(4)

1 .....

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.....

2 .....

(h) Study Figure 1c in the Resource Booklet.

Analyse possible reasons for the differences in employment structure.

You **must** refer to the resource in your answer.

(8)

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Figure 1a

Factories in a residential area

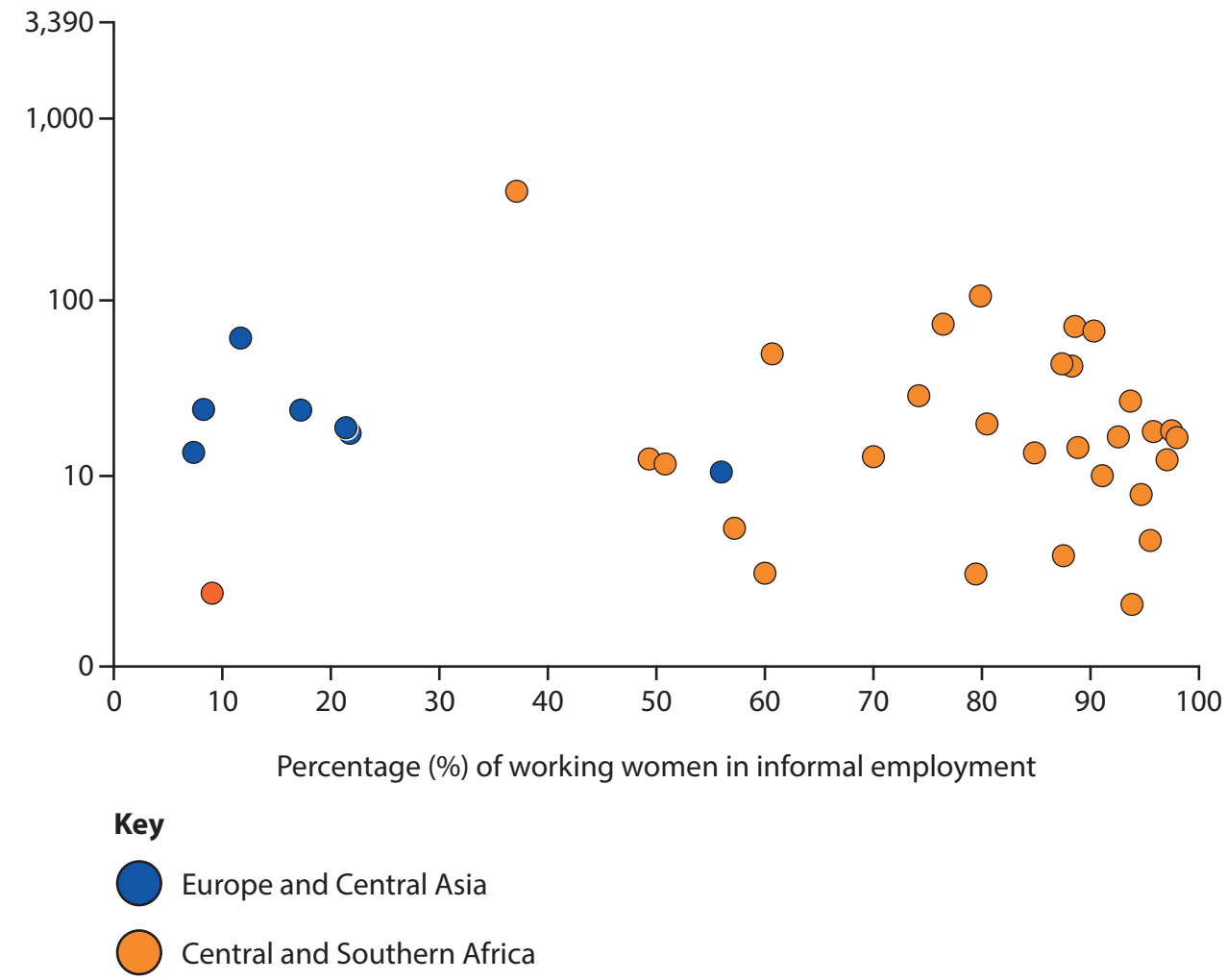


Figure 1b

Working women in informal employment and GDP for countries in selected regions, 2022

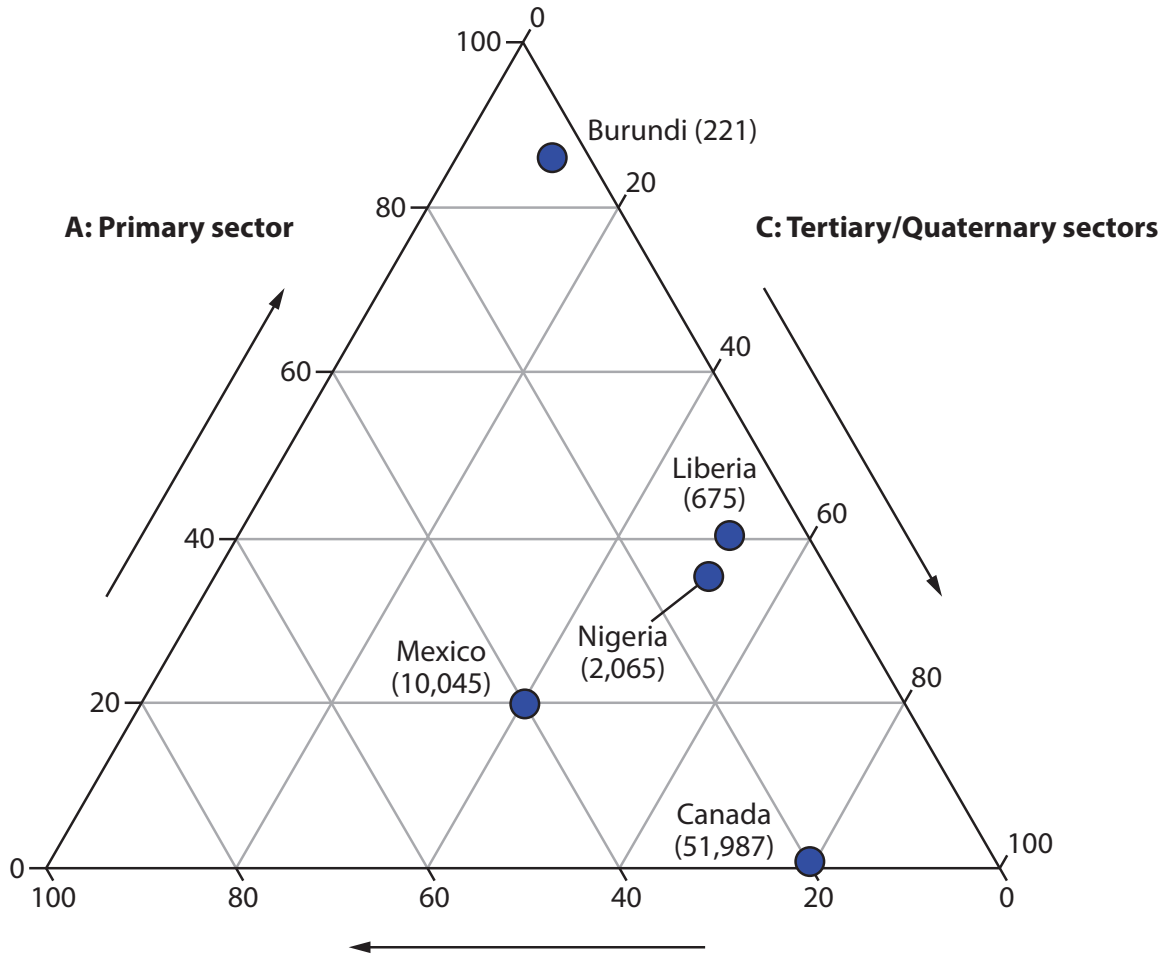


Figure 1c

Employment structure and gross domestic product (GDP) in selected countries, 2022

Note: Gross domestic product (GDP) per capita for each country shown in US$

If you answer Question 1, put a cross in the box ☒.

1 Economic activity and energy

(a) (i) Identify **one** feature of tertiary sector industries.

(1)

- ☒ **A** provision of irrigation
- ☒ **B** provision of services
- ☒ **C** use of fertilisers
- ☒ **D** use of machinery

(ii) State **one** factor that affects the location of tertiary sector industries.

(1)

.....

.....

(b) Identify **one** stage from the Clark Fisher model.

(1)

- ☒ **A** crisis point
- ☒ **B** globalisation
- ☒ **C** industrial
- ☒ **D** regeneration

(c) Study Figure 1a in the Resource Booklet.

Suggest **one** reason for the change in primary sector employment.

You **must** refer to the resource in your answer.

(2)

.....

.....

.....

.....

(d) State **one** example of a non-renewable energy source.

(1)

.....

(e) Explain **two** ways transport can be made more sustainable.

(4)

1 .....

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2 .....

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(f) Study Figure 1b in the Resource Booklet.

Suggest **one** potential impact of expanding wind energy production on the landscape shown.

You **must** refer to the resource in your answer.

(3)

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.....

.....

(g) For a named developing or emerging country, explain **two** factors that can affect energy demand.

(4)

Developing or emerging country

1

(h) Study Figure 1c in the Resource Booklet.

Analyse the different views on population growth and resources shown.

You **must** refer to the resource in your answer.

(8)

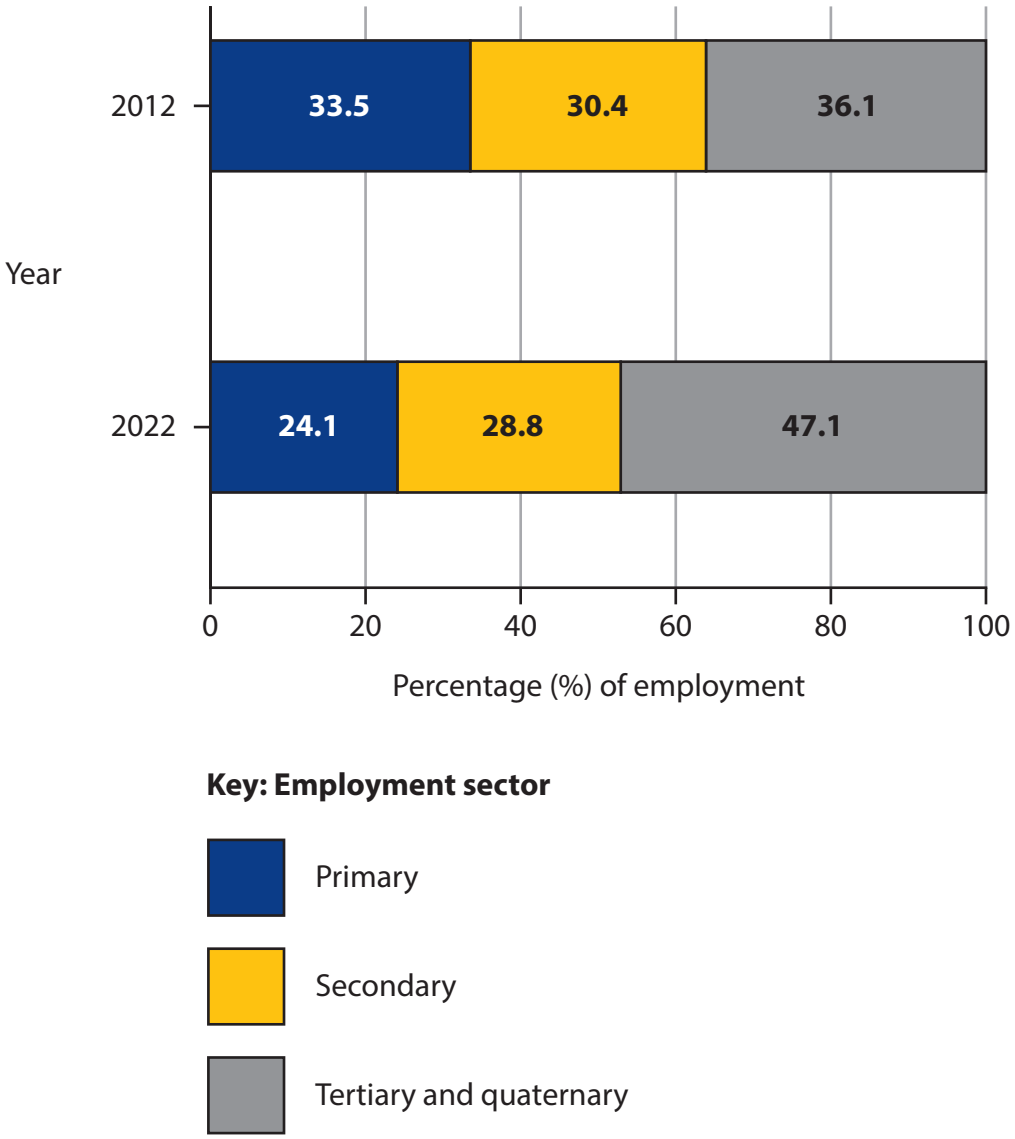


Figure 1a

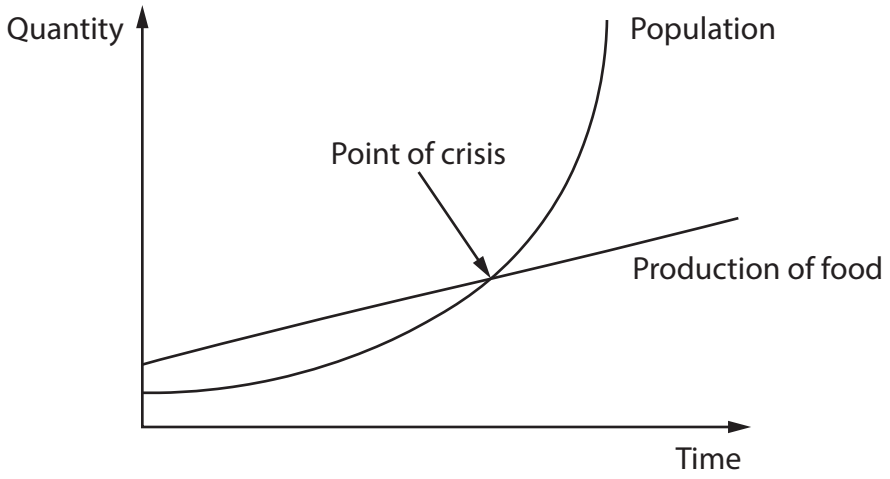
Percentage of employment in China, 2012 and 2022



Figure 1b

Wind turbines near Marsberg, Germany

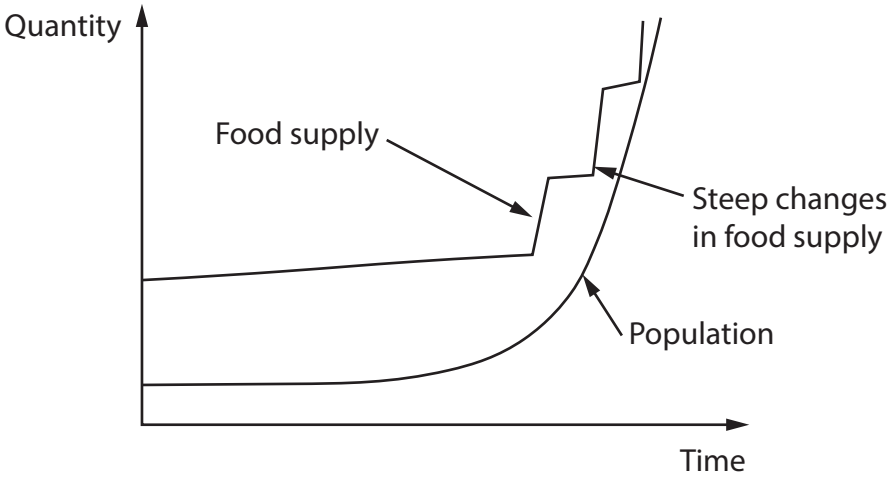
Thomas Malthus theory



Pessimistic
(expects the worst will happen)

Population growth will outstrip resources.

Ester Boserup theory



Optimistic
(hopeful and confident about the future)

Resources can keep pace with population growth.

Figure 1c

Views on the relationship between population growth and resource availability

If you answer Question 1, put a cross in the box ☒.

1 Economic activity and energy

(a) (i) Identify **one** feature associated with primary sector industries.

(1)

- ☒ **A** application of fertilisers
- ☒ **B** focus on computer services
- ☒ **C** mostly office-based jobs
- ☒ **D** production of manufactured goods

(ii) State **one** factor that can affect the location of primary sector industries.

(1)

.....

.....

(b) Identify what is shown by the Clark Fisher model.

(1)

- ☒ **A** changes in carbon emissions
- ☒ **B** changes in disposable income
- ☒ **C** changes in employment structure
- ☒ **D** changes in transport infrastructure

(c) Study Figure 1a in the Resource Booklet.

Suggest **one** reason for the change in tertiary and quaternary employment shown.

You **must** refer to the resource in your answer.

(2)

.....

.....

.....

.....

(d) State **one** example of a renewable energy resource.

(1)

.....

(e) Explain **two** ways people can use energy more sustainably in their homes.

(4)

1 .....

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.....

.....

2 .....

(f) Study Figure 1b in the Resource Booklet.

Suggest **one** potential impact of the energy production method shown.

You **must** refer to the resource in your answer.

(3)

(g) For a named developing or emerging country, explain **two** factors that can affect energy supply.

(4)

Developing or emerging country

1

(h) Study Figure 1c in the Resource Booklet.

Analyse the different relationships shown between population growth and resource availability.

You **must** refer to the resource in your answer.

(8)

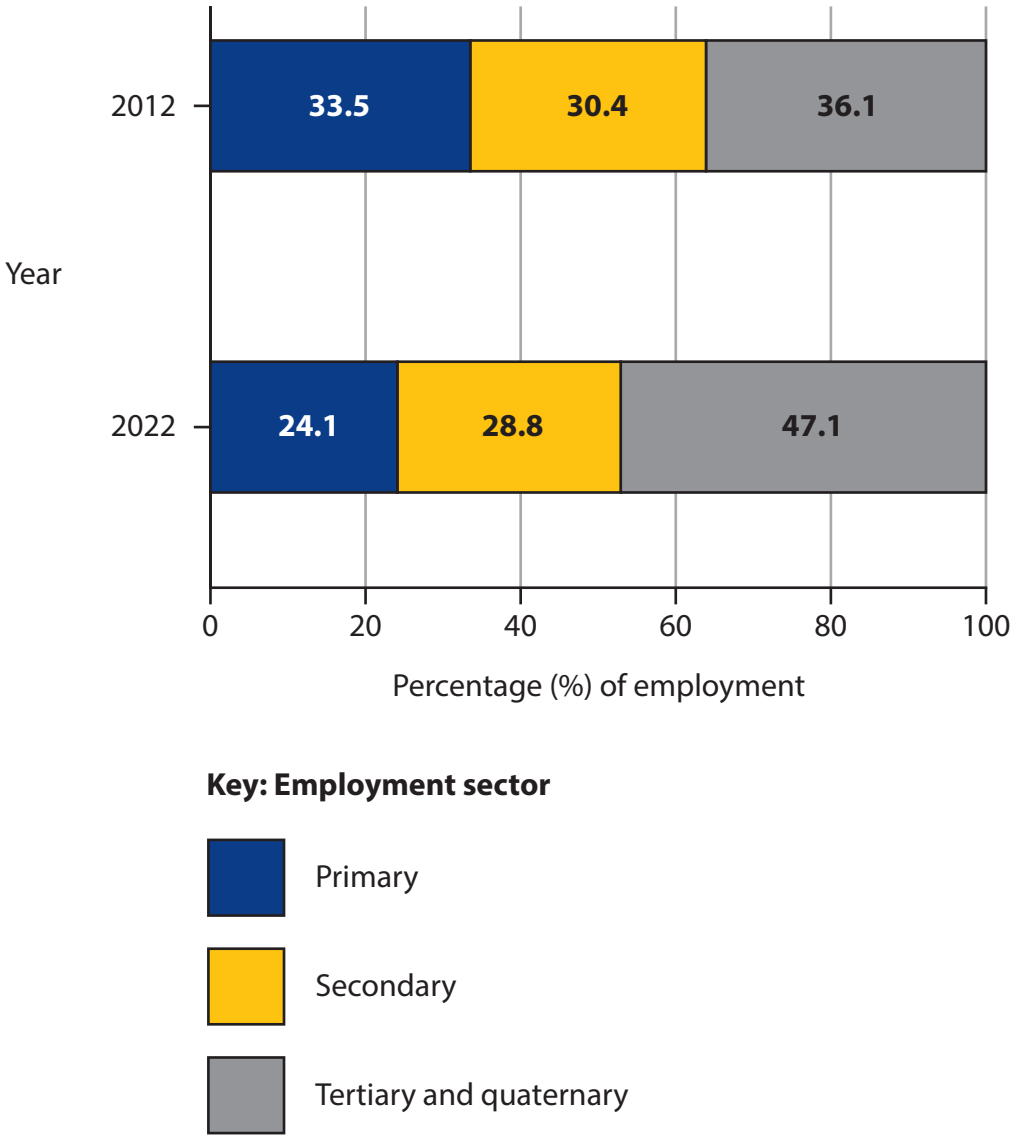


Figure 1a

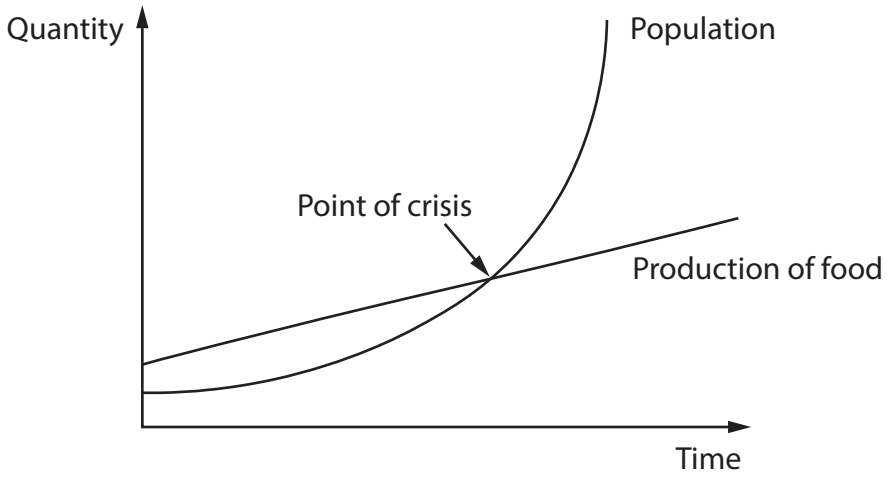
Percentage of employment in China, 2012 and 2022



Figure 1b

Coal power station, Bełchatów, Poland

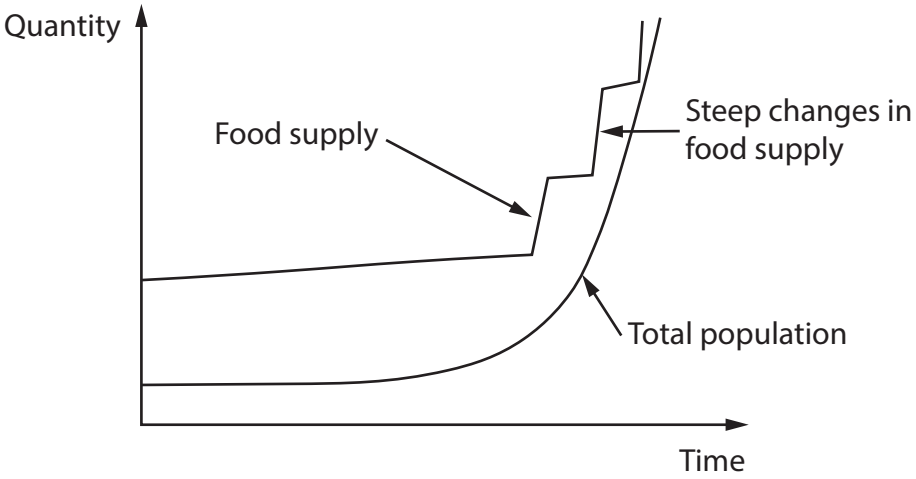
Thomas Malthus theory



Pessimistic
(expects the worst will happen)

Population growth will outstrip resources.

Ester Boserup theory



Optimistic
(hopeful and confident about the future)

Resources can keep pace with population growth.

Figure 1c

Views on the relationship between population growth and resource availability

SUB-TOPIC

FIELDWORK: INVESTIGATING ECONOMIC ACTIVITY AND ENERGY

16 questions in this booklet

4 Investigating economic activity and energy.

You have studied economic activity and energy as part of your own geographical enquiry.

State the title of your geographical enquiry.

.....

(a) (i) State **one** type of sampling you used in your geographical enquiry.

(1)

.....

(ii) Explain **one** way this sampling technique helped you to collect reliable data or information.

(2)

.....

.....

.....

.....

(b) Explain **one** way you managed a risk associated with your primary data collection.

(2)

.....

.....

.....

.....

(c) Draw an annotated sketch map or annotated diagram to show how you selected locations to collect your fieldwork data.

(3)

(d) Explain **two** limitations of the method that you used to collect **qualitative data**.

(4)

1 .....

.....

.....

.....

2 .....

(e) Study Figures 4a, 4b and 4c in the Resource Booklet. They show three different data presentation techniques from a student's investigation into developing energy resources.

The aim of the student's enquiry was to investigate the attitudes towards the plans for a new biomass power station in a rural part of Ireland.

The student used three different presentation techniques to help understand people's opinions towards the proposed energy development.

Evaluate how effective the techniques were in presenting the data and information collected.

(8)

Question	People's views				Total
	Strongly disagree	Slight disagreement	Not sure	Slight agreement	
A				3	3
B				7	7
C	2	5	3		20
D	6	1	3		10
E	2	2	2	2	8
F		5	5		10
G	1	6	3		10
H			1	2	9

Figure 4a

Results from a survey of people's views on a proposed biomass power plant

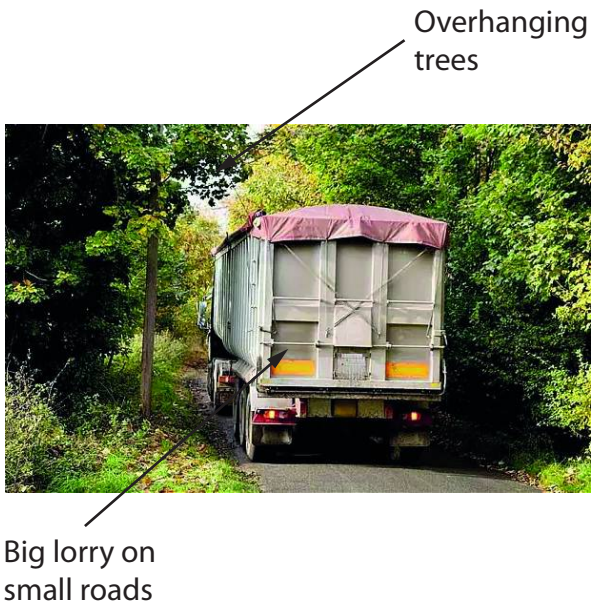


Figure 4b

Photographic results evidence lorry traffic on small roads

(Source: © Kumar Sriskandan / Alamy Stock Photo)



Figure 4c

Presentation of attitudes towards the biomass power plant

If you answer Question 4 put a cross in the box ☒

4 Investigating economic activity and energy.

You have studied economic activity and energy as part of your own geographical enquiry.

(a) (i) State **one** type of secondary data you used in your geographical enquiry.

(1)

.....

(ii) Explain **one** way this secondary data helped you when investigating energy.

(2)

.....

.....

.....

.....

(b) State the title of your geographical enquiry.

.....

Explain **one** reason why this title was suitable for your geographical enquiry.

(2)

.....

.....

.....

.....

(c) Explain **one** limitation of a method that you used to collect **quantitative data**.

(3)

(d) Explain **two** methods you used to analyse some of your fieldwork data.

(4)

Method 1

Method 2

(e) Study Figures 4a and 4b in the Resource Booklet. They show two different data presentation techniques from a student's fieldwork into energy use.

The aim of the student's investigation was to identify attitudes towards the plans for a new nuclear power station in north-west India.

The student carried out two different types of surveys into people's opinions and attitudes towards the proposed energy development.

Evaluate the student's data presentation techniques.

(8)

Question number	Peoples' Responses				Total
	Strongly disagree	Slight disagreement	Not sure	Slight agreement	
1				3	3
2				7	7
3	2	5	3		20
4	6	1	3		10
5	2	2	2	2	8
6		5	5		10
7	1	6	3		10
8			1	2	9

Figure 4a

Results from a questionnaire survey into the proposed nuclear power station



Figure 4b

Interview results on the proposed nuclear power station

4 Investigating economic activity and energy

You have studied economic activity and energy as part of your own geographical enquiry.

State the title of your geographical enquiry.

.....

.....

(a) (i) State **one** type of **primary** data you used in your geographical enquiry.

(1)

.....

(ii) Explain **one** way this **primary** data helped you when investigating economic activity and energy.

(2)

.....

.....

.....

.....

(b) State the location of your geographical enquiry.

.....

Explain **one** reason why this location was suitable for your geographical enquiry.

(2)

.....

.....

.....

.....

(c) Explain **one** way you used **secondary** data to support your geographical enquiry.

(3)

(d) Explain **two** techniques you used to analyse some of your fieldwork data.

(4)

1

2

(e) Study Figures 4a and 4b in the Resource Booklet. They show an extract from a student's conclusion and evaluation into the changing use of energy, and an annotated photograph.

> The aim of the student's enquiry was to investigate the attitudes towards the changing energy use in a rural area of Cornwall, UK.
>
> The student carried out a questionnaire, environmental quality survey and took photographs, which the student annotated.

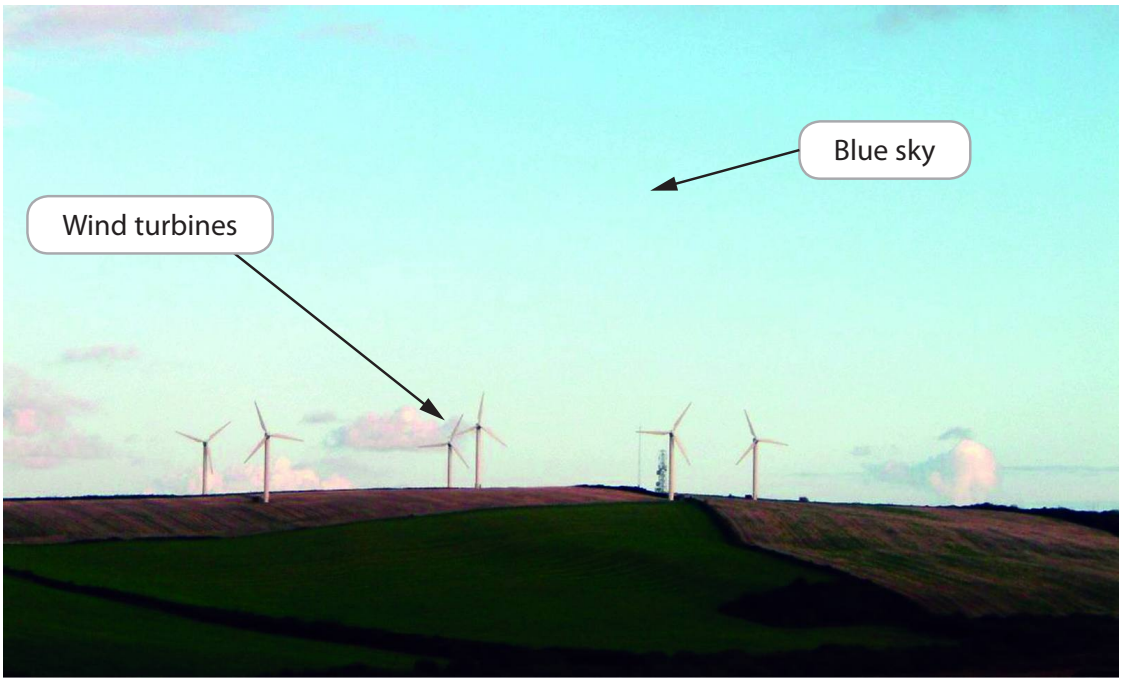
Evaluate the student's written conclusion, evaluation and annotated photograph.

(8)

Comments	Conclusions
1	I found that there were lots of differences in the environmental quality survey between the areas.
2	The questionnaire showed rural areas are having a lot of changes at the moment.
3	There is a big difference in the areas based on how they look.
	Evaluations
4	I think my results were very reliable but if I had more time I would have had a larger questionnaire sample.
5	The environmental quality survey worked well but we should have used other people to fill in the forms.
6	Overall the fieldwork was very beneficial to my knowledge of geography and I enjoyed the investigation.

Figure 4a

An extract from a student's conclusions and evaluations



(Source: © David Holmes Geography)

Figure 4b

An annotated photograph that was used as part of the conclusion

If you answer Question 4 put a cross in the box ☒.

4 Investigating economic activity and energy

You have studied economic activity and energy as part of your geographical enquiry.

State the title of your geographical enquiry.

.....

.....

(a) Explain how you managed **one** risk associated with your geographical enquiry.

(2)

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(b) (i) Explain **one** limitation of a method that you used to collect **qualitative** data.

(2)

Qualitative method .....

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(ii) Explain **one** way you could have improved the collection of your qualitative data.

(2)

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(c) Explain **one** way secondary data was used to support your geographical enquiry.

(2)

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(d) Explain **two** methods you used to present some of your fieldwork data.

(4)

1 .....

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.....

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2 .....

(e) Study Figures 4a and 4b in the Resource Booklet. These show extracts from a student's methods and techniques used to investigate the changing use of energy.

> The aim of the student's enquiry was to investigate the attitudes and perceptions about changing energy use.
>
> The student designed a method and carried out a questionnaire.

Evaluate the student's data collection methods.

(8)

- Sample size will be 5–10 questionnaires to local people and visitors.
- Questionnaires undertaken at lunchtime.
- I will ask every 8th person that I see in the street.

Figure 4a

The student's proposed design methodology

Hello, I'm a student on a GCSE Geography field trip. I would like to ask you a few questions. It won't take long.

1. **What do you think of the new biomass plant being built here? Do you like the idea?**
Mark only one oval.

	1	2	3	4	5	
Yes, I'm really happy	◯	◯	◯	◯	◯	No, I really don't want it

2. **Lots of people are worried about climate change. How do you think it will affect this area?**
Mark only one oval.

- ◯ More cyclones
- ◯ More flooding
- ◯ More tornadoes
- ◯ More earthquakes
- ◯ Not sure

3. **How old are you?**
Check all that apply.

- ☐ 0-10
- ☐ 10-20
- ☐ 20-30
- ☐ 30+

4. **Do you think 'green energy' is better than a gas-fired power station?**
Check all that apply.

- ☐ Yes
- ☐ No
- ☐ Don't know

Figure 4b

An extract from a student's questionnaire

If you answer Question 4 put a cross in the box ☒

4 Investigating economic activity and energy

(a) Study Figure 4a in the Resource Booklet.

(i) State **one** piece of secondary data that would be useful to investigate the impacts of this on the environment.

(1)

.....

.....

(ii) Explain why photographs are a useful source of primary data.

(2)

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.....

(b) Study Figure 4c below. It shows data from an environmental quality survey carried out in five sites around a new renewable energy power plant.

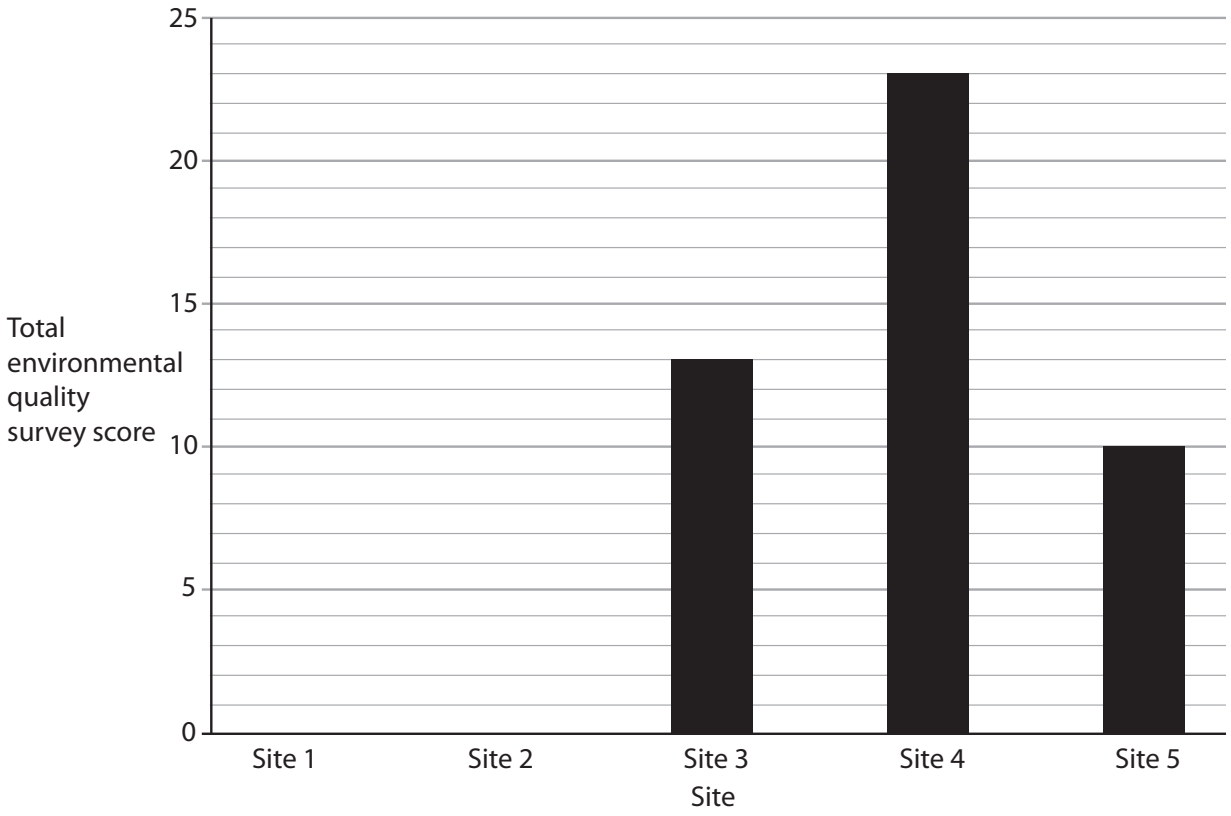


Figure 4c

A graph of environmental quality survey data

(i) Plot the data for sites 1 and 2 (from Figure 4b in the Resource Booklet) to complete the graph above (Figure 4c).

Some data has been plotted for you.

(2)

(ii) Identify the type of graph shown in Figure 4c.

(1)

☒	**A** Bar
☒	**B** Line
☒	**C** Pie
☒	**D** Scatter

(iii) Identify the site in Figure 4c that has the highest environmental quality score.

(1)

(iv) Calculate the range in environmental quality scores.

Show all your workings.

(2)

(c) Explain **one** way you could manage a risk during fieldwork in an area close to a renewable energy power plant.

(3)



Figure 4a

Photograph of a new renewable energy plant

Environmental quality indicator	Site 1	Site 2	Site 3	Site 4	Site 5
Building condition (1 = Poor condition/5 = Good condition)	4	5	3	5	2
Road quality (1 = Poor condition/5 = Good condition)	4	2	3	5	2
Noise (1 = Very noisy/5 = No noise)	4	3	3	4	1
Litter (1 = A lot of litter/5 = No litter)	4	4	3	5	3
Air pollution (1 = Poor air quality/5 = Good air quality)	4	1	1	4	2
Total environmental quality score	20	15	13	23	10

Figure 4b

Extract from a table of results from an environmental quality survey

If you answer Question 4 put a cross in the box ☒

4 Investigating economic activity and energy

(a) Study Figure 4a in the Resource Booklet.

(i) Identify **one** type of qualitative data collection in this enquiry.

(1)

.....

.....

(ii) Explain **one** type of sampling method chosen by the student.

(2)

.....

.....

(b) Study Figure 4b in the Resource Booklet. It shows results from a questionnaire carried out as part of a student's geographical enquiry.

(i) Plot the data for the questionnaire for **Question 2** (Figure 4b in the Resource Booklet) to complete Figure 4c below.

(2)

Some data has been plotted for you as an example.

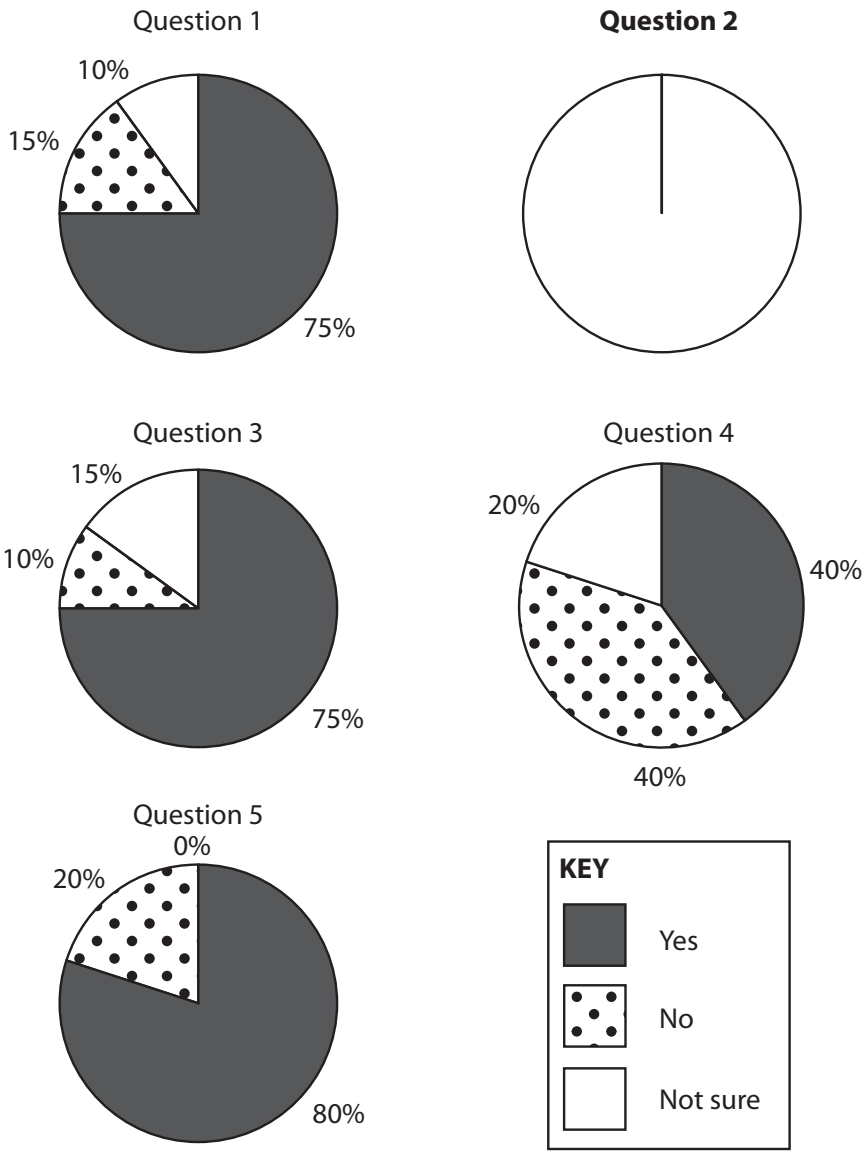


Figure 4c

Results from a questionnaire presented in pie charts

(ii) Identify **one** advantage of using a questionnaire.

(1)

☒	**A** An expensive data collection method compared to other methods.
☒	**B** Guarantees responses from people.
☒	**C** Potential to generate a mixture of qualitative and quantitative data.
☒	**D** Provides data about everything you need to know.

(iii) Identify the correct statement below.

(1)

☒	**A** The mean percentage for people who answered 'not sure' was 1.
☒	**B** The mean percentage for people who answered 'not sure' was 11.
☒	**C** The mean percentage for people who answered 'not sure' was 21.
☒	**D** The mean percentage for people who answered 'not sure' was 31.

(iv) Suggest **one** way the data collection for this enquiry could be improved.

(2)

.....

.....

(c) Suggest **one** advantage of using secondary data as part of this enquiry.

(3)

.....

.....

.....

.....

.....

Method	Purpose	Details
Secondary data from websites and newspapers	To provide background information on the study site.	Conduct web search using Google and Google Scholar for selected key words.
Photographs/Field sketches	To provide a visual record of the different parts of the enquiry site.	Take photos and field sketches where possible.
Environmental Quality Survey	To provide an understanding of how environmental quality varies across the site.	To be conducted at five sites at regular intervals along a road.
Questionnaire	To understand different views of the developments taking place.	Complete 10 questionnaires. Two at each site.

Figure 4a

An extract from a student's methodology

	Yes (%)	No (%)	Not sure (%)
Question 1: Did you think this area needs to be improved?	75	15	10
Question 2: Do you think the developments have improved the area?	50	40	10
Question 3: Do you think further improvements need to be made?	75	10	15
Question 4: Do you think local government should be responsible for leading the development of this area?	40	40	20
Question 5: Are you local to this area?	80	20	0

Figure 4b

Extract from a student's questionnaire

Method	Purpose	Details
Secondary data from websites and newspapers	To provide background information on the study site.	Conduct web search using Google and Google Scholar for selected key words.
Photographs/Field sketches	To provide a visual record of the different parts of the enquiry site.	Take photos and field sketches where possible.
Environmental Quality Survey	To provide an understanding of how environmental quality varies across the site.	To be conducted at five sites at regular intervals along a road.
Questionnaire	To understand different views of the developments taking place.	Complete 10 questionnaires. Two at each site.

Figure 4a

An extract from a student's methodology

	Yes (%)	No (%)	Not sure (%)
Question 1: Did you think this area needs to be improved?	75	15	10
Question 2: Do you think the developments have improved the area?	50	40	10
Question 3: Do you think further improvements need to be made?	75	10	15
Question 4: Do you think local government should be responsible for leading the development of this area?	40	40	20
Question 5: Are you local to this area?	80	20	0

Figure 4b

Extract from a student's questionnaire

4 Investigating economic activity and energy

Study Figures 4a and 4b in the Resource Booklet. These show extracts from a student's data collection and presentation methods.

> The aim of the student's investigation was to understand people's attitudes to making their homes more energy efficient in Vancouver, Canada.
>
> The student carried out a questionnaire, took photographs of energy efficiency measures, and used secondary data about energy consumption in homes in Canada.

(a) Identify **one** question in Figure 4a that would produce qualitative data.

(1)

(b) Identify **one** advantage of the presentation type shown in Figure 4b.

(1)

(c) Explain **one** type of sampling that could have been used in this investigation.

(2)

(d) Study Figures 4a and 4b in the Resource Booklet.

Evaluate the student's data collection and presentation methods.

(8)

Questionnaire: Investigating energy efficiency in the home

1. Do you think your home is energy efficient?

   Yes ☐ No ☐

2. Do you want to make your home more energy efficient?

   Yes ☐ No ☐

3. Why?

.....

.....

.....

4. How do you think you could make your home more energy efficient?

.....

.....

.....

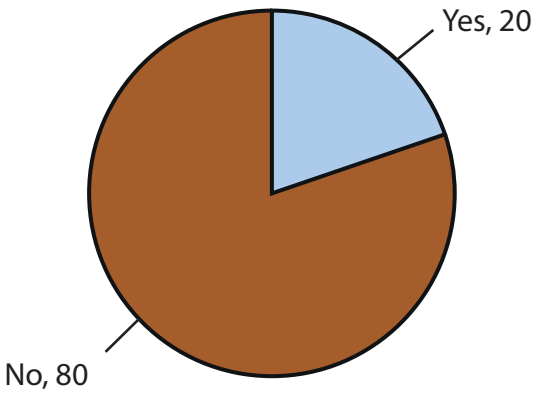
5. On a scale of 1–5 how likely are you to make the following changes to your home:

	1	2	3	4	5
Solar panels	☐	☐	☐	☐	☐
New windows (with double glazing)	☐	☐	☐	☐	☐
Roof insulation	☐	☐	☐	☐	☐
Underfloor heating	☐	☐	☐	☐	☐

Figure 4a

An extract from a student's questionnaire

Question 1. Do you think your home is energy efficient?



Question 2. Do you want to make your home more energy efficient?

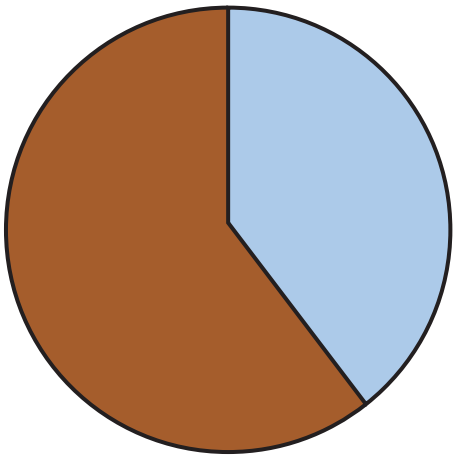


Figure 4b

An extract from a student's data presentation

4 Investigating economic activity and energy

Study Figures 4a and 4b in the Resource Booklet. These show extracts from a student's data analysis, conclusions and evaluations about the changing use of energy.

> The aim of the student's investigation was to investigate local attitudes towards the development of a new solar energy farm.
>
> The student carried out a questionnaire, environmental quality survey and took photographs, which the student annotated, and collected newspaper articles including photos of the area.

(a) Identify **one** source of secondary data used by the student.

(1)

(b) Identify **one** advantage of using a questionnaire as a data collection method.

(1)

(c) Suggest **one** way the reliability of the data could have been affected.

(2)

(d) Study Figures 4a and 4b in the Resource Booklet.

Evaluate the student's data analysis and conclusions.

(8)



Figure 4a

Word cloud from questionnaire responses about views on a new solar energy farm

Conclusions	
1	I found that there were a lot of views about the new solar energy farm.
2	The questionnaire showed that most of the local people are against the new development.
3	The photographs show that the solar energy farm is relatively small compared to the number of fields that are currently used for farming.
Evaluations	
4	I think my results were very reliable but if I had more time I would have asked more people to complete my questionnaire.
5	I was able to use newspaper articles about other new solar energy farms to consider if the views from local people were similar.
6	The photographs were good to remind me of the place I visited on fieldwork, but I didn't know how to use them well to present my data.

Figure 4b

An extract from a student's written conclusion and evaluation

4 Investigating economic activity and energy

(a) Study Figure 4b in the Resource Booklet.

(i) Identify **one** of the closed questions in the questionnaire.

(1)

.....

(ii) Explain why open questions can be useful in a questionnaire.

(2)

.....

.....

.....

.....

(b) Study Figure 4a in the Resource Booklet.

(i) Identify a type of sampling used for the questionnaire.

(1)

.....

(ii) Plot the remaining data for Site 1 (Figure 4c in the Resource Booklet) to complete the bar graph below (Figure 4d).

Some data has been plotted for you as an example.

(2)

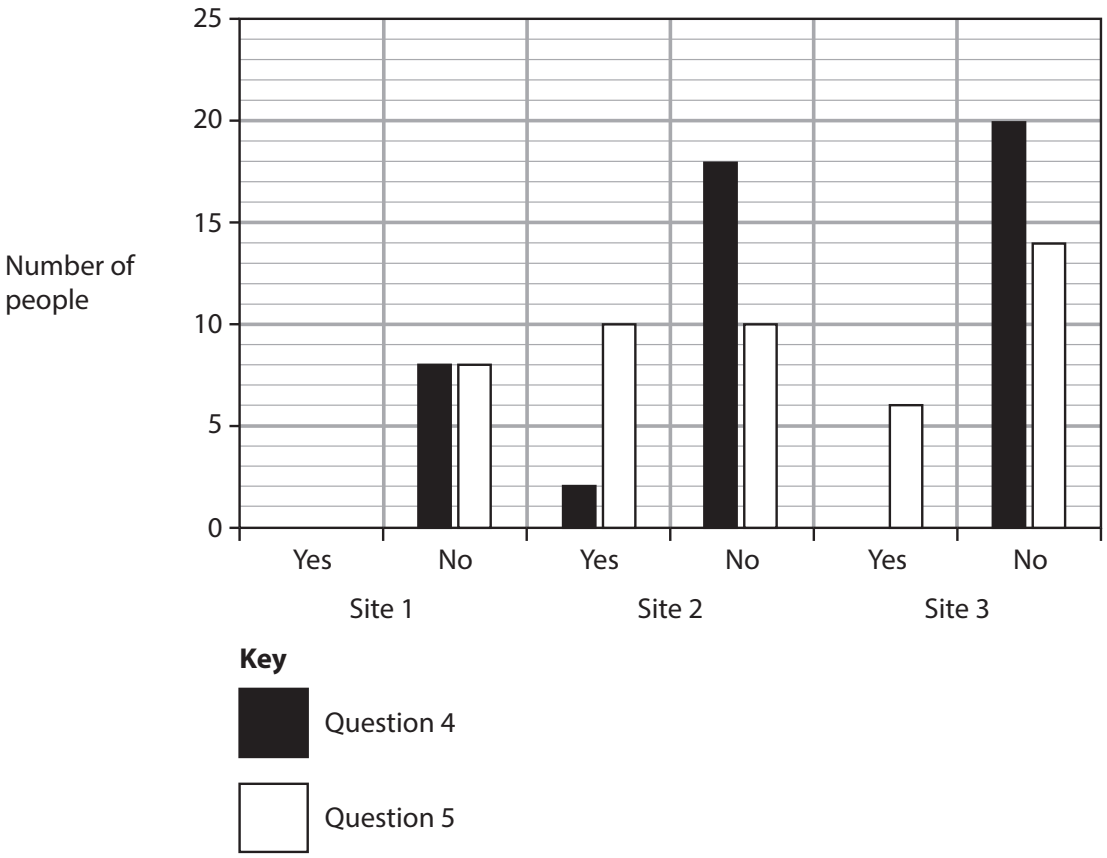


Figure 4d

Bar graph to show data from questionnaire

(iii) Identify the site that had the largest range for Question 1 in the questionnaire.

(1)

.....

(iv) Calculate the mean number of people who would like to own an electric car (Question 5).

(2)

Write your answer to 1 decimal place.

Show all your workings.

.....

(c) Explain **one** other data collection method the students could have used in this enquiry.

(3)

(d) You have studied economic activity and energy for your own geographical enquiry.

State the title of your geographical enquiry.

Evaluate the data presentation techniques you used.

(8)

Geographical enquiry title

Enquiry question: To what extent do people in different areas understand the benefits of making homes more sustainable?

A questionnaire was conducted with a total of 60 people from 3 different areas. In each area we conducted 20 questionnaires selecting every 2nd person that we met.

Figure 4a

Information about the students' data collection

Q1. Does your house have any renewable energy technology?	**Yes** ☐ **No** ☐
Q2. What type of renewable energy technology does your house have?	....
Q3. Do you think having renewable energy technology saves you money?	**Yes** ☐ **No** ☐
Q4. Do you own an electric car?	**Yes** ☐ **No** ☐
Q5. Would you like to own an electric car?	**Yes** ☐ **No** ☐
Q6. What would encourage you to use more renewable energy technology in your house?	....

Figure 4b

Extract from the students' questionnaire

	Site 1		Site 2		Site 3	
	Yes	No	Yes	No	Yes	No
Question 1	16	4	4	16	2	18
Question 3	10	10	10	10	0	20
Question 4	4	8	2	18	0	20
Question 5	12	8	10	10	6	14

Figure 4c

Extract from the students' questionnaire results

If you answer Question 4, put a cross in the box ☒.

4 Investigating economic activity and energy

(a) Study Figure 4a in the Resource Booklet.

(i) Identify **one** of the open questions in the questionnaire.

(1)

.....

(ii) Explain why closed questions can be useful in a questionnaire.

(2)

.....

.....

.....

.....

Study Figure 4b in the Resource Booklet. It shows environmental quality scores collected at regular distances from a new power plant.

(b) (i) Plot the Environmental Quality Score for 40m and 60m (Figure 4b in the Resource Booklet) to complete the scatter graph below (Figure 4c). Some data has been plotted for you as an example.

(2)

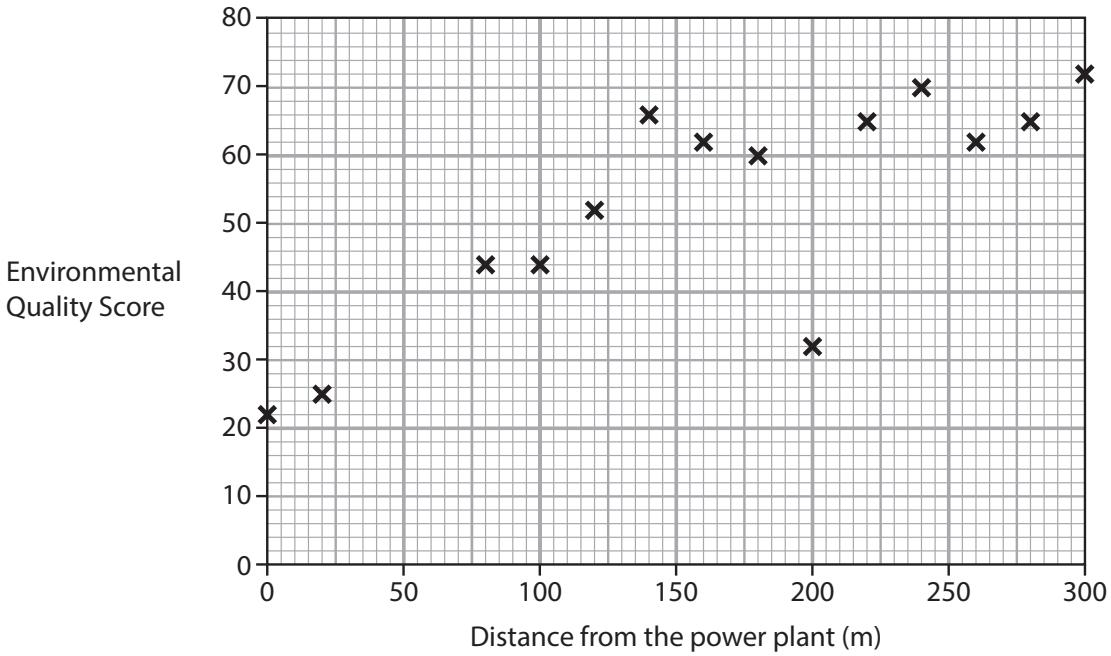


Figure 4c

(ii) Identify at which distance there is an anomaly.

(1)

.....

(iii) On Figure 4c, draw a line of best fit.

(1)

(iv) Calculate the median Environmental Quality Score (EQS).

(2)

Write your answer to one decimal place.

Show all your workings.

(c) Explain how secondary data could have been used to support this enquiry.

(3)

(d) You have studied economic activity and energy as part of your own geographical enquiry.

State the title of your geographical enquiry.

Evaluate how far your data collection methods allowed you to achieve your aim.

(8)

Geographical enquiry title

Enquiry question: How has the new power plant impacted the local area?

Q1. Do you think the new power plant is good for the area?	**Yes** ☐ **No** ☐
Q2. What benefits does it bring?	....
Q3. Do you think the new power plant will improve the local economy?	**Yes** ☐ **No** ☐
Q4. Do you think the new power plant will damage the environment?	**Yes** ☐ **No** ☐
Q5. Do you think the new power plant will affect house prices in the area?	**Yes** ☐ **No** ☐
Q6. What impact do you think the new power plant has had on the area?	....

Figure 4a

Extract from the student's questionnaire

Distance from the new power plant (m)	Total Environmental Quality Score (Max 80)
0	22
20	25
40	38
60	40
80	44
100	44
120	52
140	66
160	62
180	60
200	32
220	65
240	70
260	62
280	65
300	72

Figure 4b

Extract from the student's data collection

If you answer Question 4, put a cross in the box ☒.

4 Investigating economic activity and energy

(a) Study Figure 4a in the Resource Booklet.

(i) Identify **one** type of secondary data that could support this enquiry.

(1)

.....

(ii) Explain **one** advantage of using secondary data.

(2)

.....

.....

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.....

Study Figure 4b in the Resource Booklet. It shows some of the results from the Environmental Quality Survey (EQS).

(b) (i) Plot the data for the EQS (from Figure 4b in the Resource Booklet) to complete the radar graph below (Figure 4c). Some data has been plotted for you as an example.

(2)

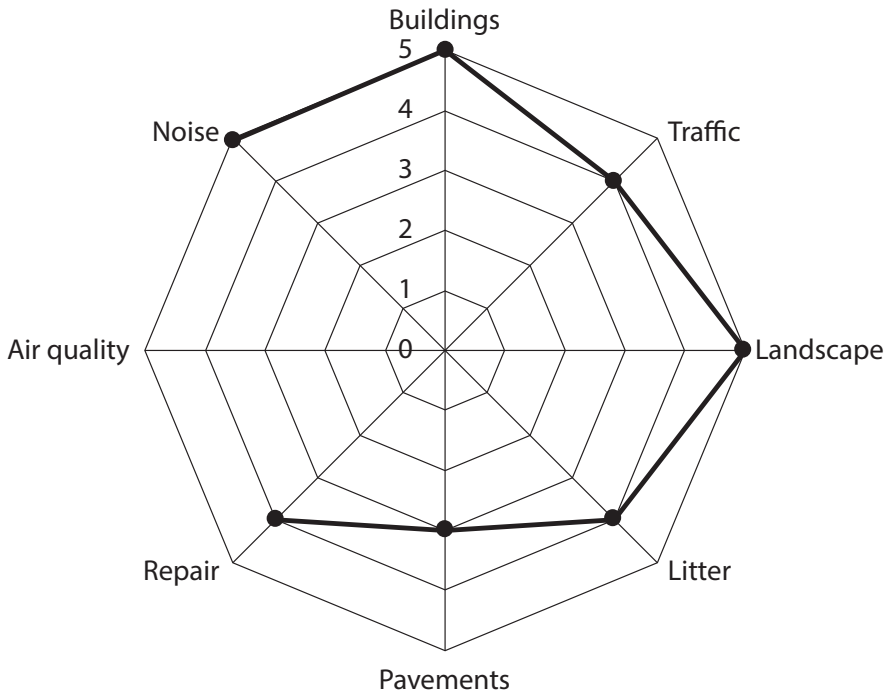


Figure 4c

Radar graph for Environmental Quality Survey

(ii) State **one** observation you can make from the data presented in Figure 4c.

(1)

.....

.....

(iii) Identify **one** advantage of using this type of graph to present data.

(1)

.....

.....

(iv) Calculate the modal Environmental Quality Score for the data shown in Figure 4b.

Show all your workings.

(2)

(c) Explain how the student's own photographs could be used in this enquiry.

(3)

(d) You have studied economic activity and energy as part of your own geographical enquiry.

State the title of your geographical enquiry.

Evaluate how the conclusions you made demonstrated that you had answered your enquiry question.

(8)

Geographical Enquiry Title

Enquiry question: What are the impacts of a new solar farm on a local community?

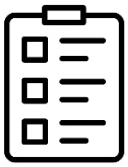
Primary data collected:



Observations of the solar farm and its surroundings



Interviews with local residents



Environment Quality Survey near the solar farm and in the local village



Field sketches of the solar farm

Figure 4a

Information about the students' enquiry and primary data collection

Indicator	Negative	1	2	3	4	5	Positive
Buildings	Buildings are in poor condition					X	Buildings are in good condition
Traffic	Large amount of traffic				X		Low amount of traffic
Landscape	Landscape is unattractive					X	Landscape is attractive
Litter	Large amount of litter				X		Small amount of litter
Pavements	Pavements are in poor condition			X			Pavements are in good condition
Repair	Many features in need of maintenance				X		Few features in need of maintenance
Air quality	Poor air quality				X		Good air quality
Noise	High noise levels					X	Low noise levels

Figure 4b

Environmental Quality Survey data from site near the solar farm

If you answer Question 4, put a cross in the box ☒.

4 Investigating economic activity and energy

You have studied economic activity and energy as part of your own geographical enquiry.

State the title of your geographical enquiry.

(a) (i) State **one** potential risk that you managed as part of your enquiry.

(1)

(ii) Explain **one** factor that affected the decision on the sites you chose to collect your data.

(2)

(b) Explain **one** way secondary data was used to support your enquiry.

(2)

(c) Explain **one** advantage and **one** disadvantage of a data presentation technique you used in your geographical enquiry.

(4)

Advantage

Disadvantage

(d) Suggest **one** reason the conclusions from your enquiry were reliable.

(3)

(e) Study Figures 4a and 4b in the Resource Booklet. They show some of the equipment chosen and some of the data collection methods used, including an interview guide.

The aim of the student's enquiry was to investigate local residents' attitudes to the construction of a new wind farm on the edge of Berlin, Germany.

Evaluate the choice of equipment and the data collection methods used.

You **must** refer to the resources in your answer.

(8)

Fieldwork equipment	Data collection methods
Mobile phone (with camera) Environmental quality survey sheet Interview guide	Review of newspaper articles Photographs Environmental quality survey Interviews

Figure 4a

Fieldwork equipment and data collection methods used

Interview guide	
Q1	To which age group do you belong? ....
Q2	How long have you lived in this area? Under a year ☐ 1–5 years ☐ 5–10 years ☐ 10 years + ☐
Q3	What are your views on renewable energy? ....
Q4	Do you support the construction of a new wind farm? Yes ☐ No ☐
Q5	What do you think the land should be used for? ....
Q6	On a scale of 1–5 what impact do you think the new wind farm will have on the local area? 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ (Very negative) (Very positive)

Figure 4b

Interview guide

If you answer Question 4, put a cross in the box ☒.

4 Investigating economic activity and energy

You have studied changing energy as part of your own geographical enquiry.

State the title of your geographical enquiry.

.....

.....

(a) State **one** type of sampling used in your enquiry.

(1)

.....

(b) Explain **one** way you managed a risk as part of your enquiry.

(2)

.....

.....

.....

.....

(c) (i) Describe how you used **one** piece of equipment to collect your primary data.

(2)

.....

.....

.....

.....

(ii) Explain **one** advantage and **one** disadvantage of a primary data collection method you used in your enquiry.

(4)

Advantage

Disadvantage

(d) Explain **one** way you tried to make sure your results were accurate.

(3)

(e) Study Figures 4a and 4b in the Resource Booklet. They show some of the data presentation methods used by the student.

The aim of the student's enquiry was to investigate the impact of a new wind farm on a local village.

The student collected data at five sites near the wind farm. The data included an environmental quality survey, a questionnaire with people in the local village and taking photographs.

Evaluate the data presentation methods used by the student.

You **must** refer to the resources in your answer.

(8)

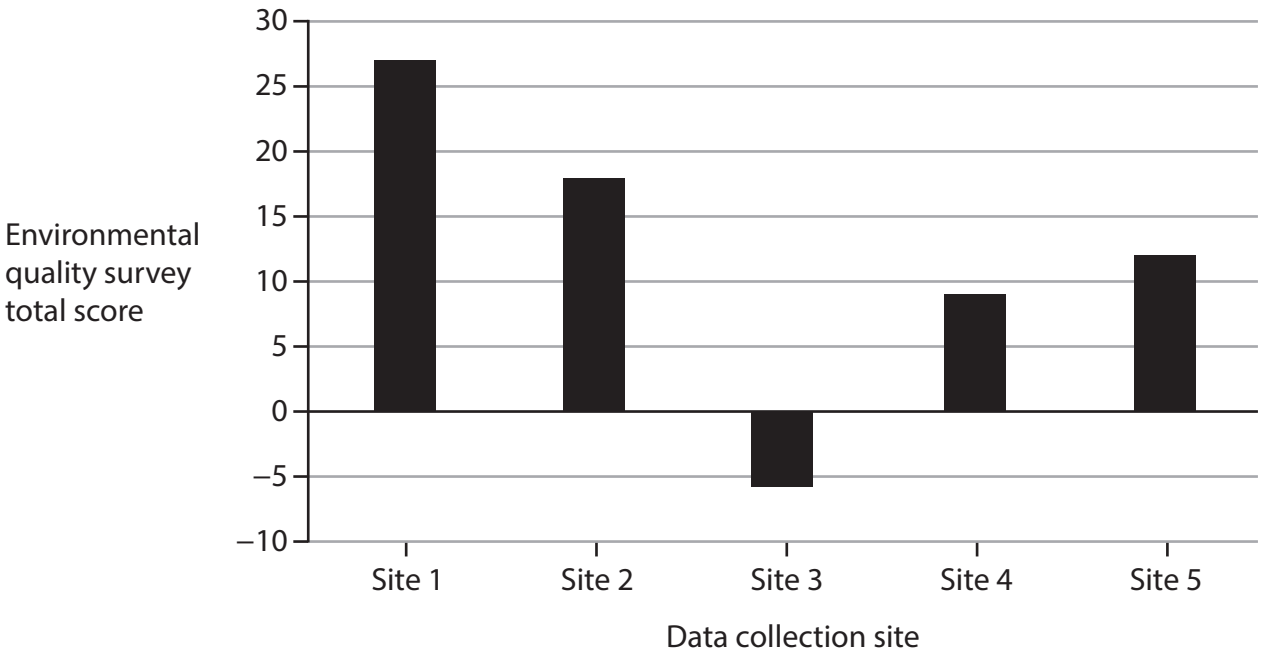


Figure 4a

Bar graph of environmental quality total scores

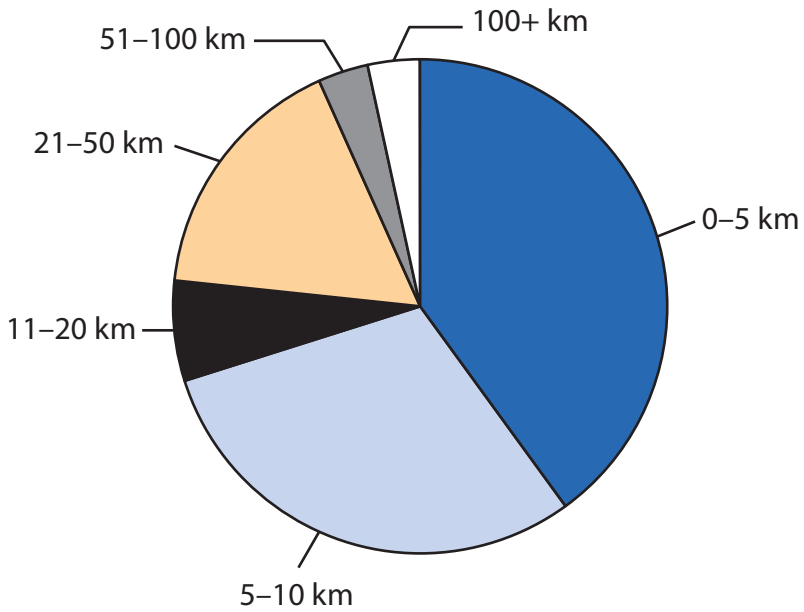


Figure 4b

Pie chart showing responses to the question, "How far have you travelled today?"

4 Investigating economic activity and energy

You have studied economic activity and energy as part of your own geographical enquiry.

State the title of your enquiry.

.....

.....

(a) (i) Name **one** type of graph you used to present your data.

(1)

.....

(ii) Explain **one** reason for your choice of graph.

(2)

.....

.....

.....

.....

(b) Explain **one** qualitative primary data collection technique you used in your enquiry.

(2)

.....

.....

.....

.....

(c) Explain **two** ways you used secondary data in your enquiry.

(4)

1 .....

.....

.....

.....

2 .....

.....

.....

.....

(d) Suggest **one** improvement you could have made to your data analysis.

(3)

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.....

(e) Study Figures 4a, 4b and 4c in the Resource Booklet. They show key information about the methodology, part of the data presentation and some conclusions.

> The aim of the student's enquiry was to investigate the use of renewable energy sources in a village.

Evaluate the student's data presentation method and conclusions.

You **must** refer to the resources in your answer.

(8)

.....

.....

.....

.....

.....

- Evidence recorded of renewable energy use along a transect.
- Photographs.
- Questionnaire for local residents.
- Secondary data on local schemes for supporting renewable energy for homes.

Figure 4a

Data collection methods

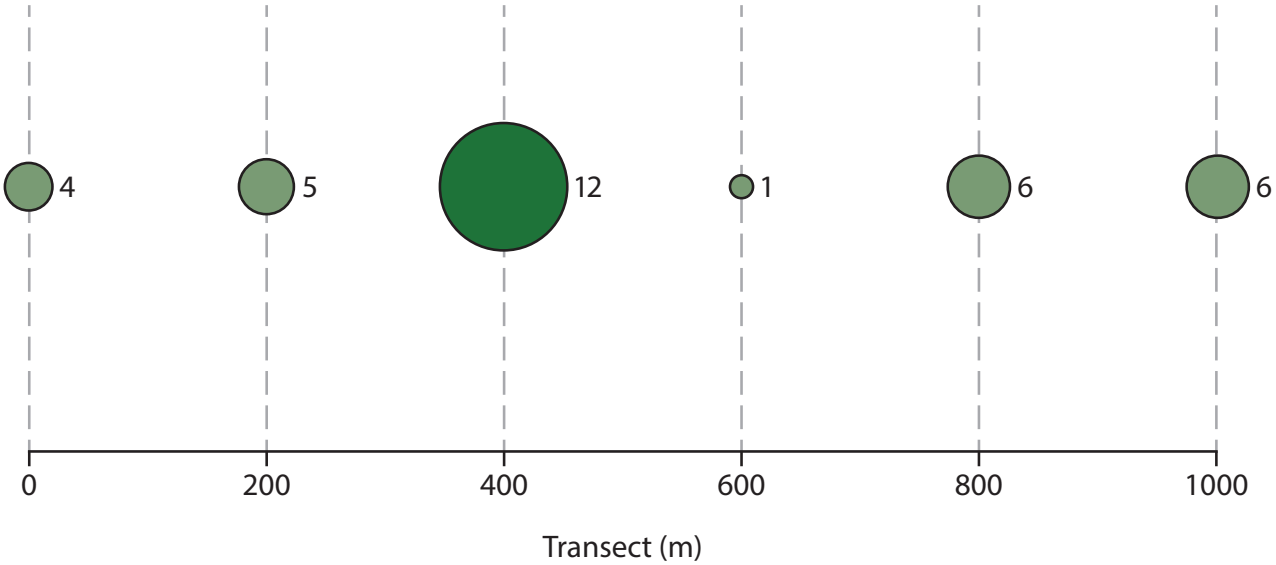


Figure 4b

Evidence of buildings with solar panels along a transect

1	Solar panels are a popular source of renewable energy for residents in the village.
2	Renewable energy is accessible to everyone in the village.
3	Renewable energy sources have a positive impact on the lives of residents in the village.
4	There are a range of options to support sustainable energy use in the village.

Figure 4c

Conclusions

If you answer Question 4, put a cross in the box ☒.

4 Investigating economic activity and energy

Study Figures 4a and 4b in the Resource Booklet. They show some information about data collection methods students used and an extract from their questionnaire results.

> The aim of the students' enquiry was to investigate views on the use of solar panels in residential areas in Paris.

(a) Identify **one** piece of equipment that could be used in this enquiry.

(1)

(b) Identify **one** type of secondary data collected by the students.

(1)

(c) Explain why the students may have chosen random sampling for the questionnaire.

(3)

(d) (i) Plot the data for Site 1, Question 3, from Figure 4b in the Resource Booklet, to complete the bar chart in Figure 4c in the Question Paper.

(2)

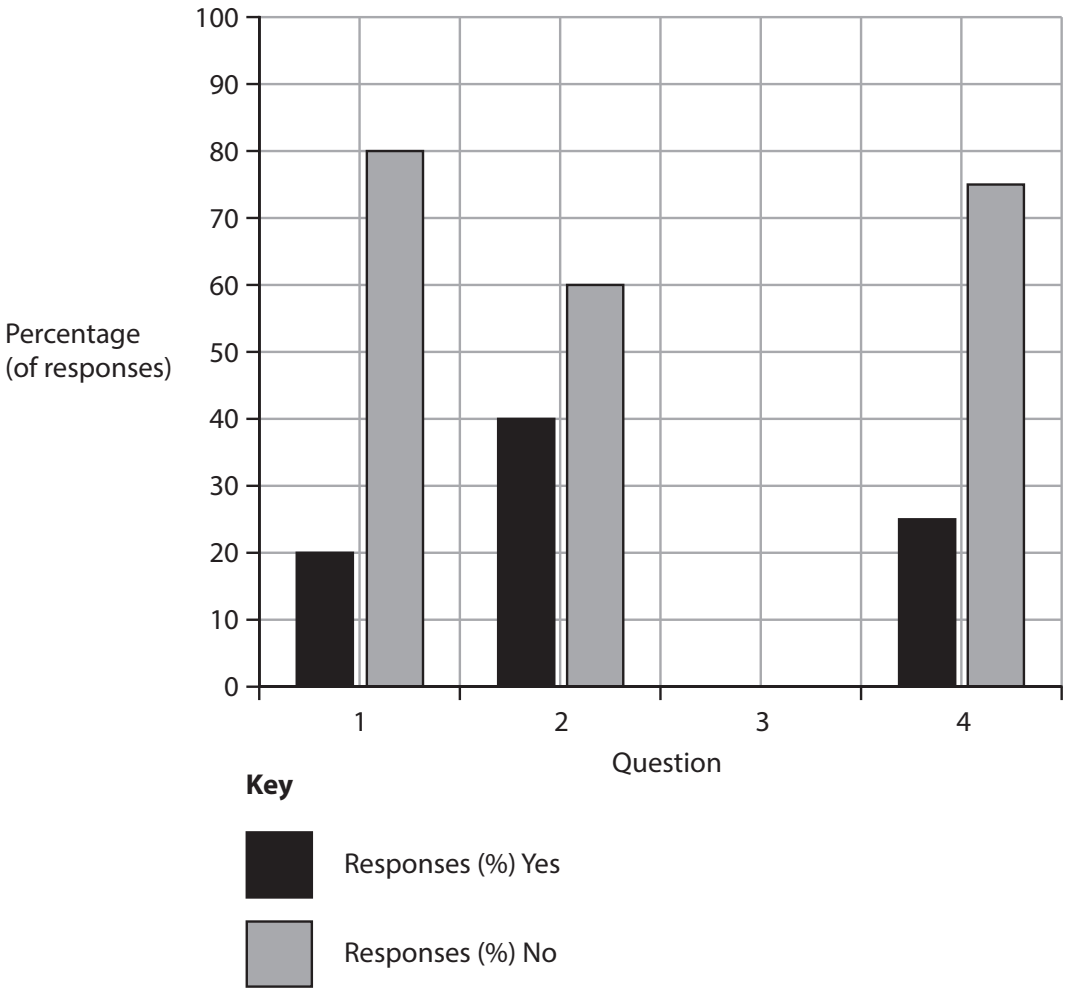


Figure 4c

(ii) State **one other** data presentation method that could have been used for the data shown in Figure 4c.

(1)

.....

(iii) Calculate the range in the number of responses for respondents that selected 'Yes' for Question 2 in Figure 4b in the Resource Booklet.

You **must** show all your workings.

(2)

.....

(e) State **one** advantage and **one** disadvantage of the data presentation method used in Figure 4c.

(2)

advantage

.....

.....

disadvantage

.....

.....

(f) You have studied economic activity and energy as part of your own geographical enquiry.

Evaluate the importance of qualitative data in helping you reach your conclusions.

(8)

State the title of your geographical enquiry.

	Data collection methods	Details
1	• Environmental quality survey	• Conducted in three places where solar panels were visible.
2	• Questionnaires	• 20 people in the area selected at random.
3	• Photographs	• Taken at each site for environmental quality survey and where questionnaires collected.
4	• Information on schemes for homeowners to install solar panels.	• Websites and leaflets with details on local solar power schemes.
5	• Data on the number of solar panels in Paris.	• Data collected for 2014 to 2024.

Figure 4a

Data collection methods used

	Question	Responses (%)					
		Site 1		Site 2		Site 3	
		Yes	No	Yes	No	Yes	No
1	Do you have solar panels at home?	20	80	0	100	10	90
2	Do you know other people who have solar panels at home?	40	60	20	80	50	50
3	Do you think the government should provide grants to encourage people to have solar panels?	95	5	80	20	75	25
4	Do you think solar panels are suitable for every home?	25	75	50	50	40	60

Figure 4b

Extract from questionnaire results

4 Investigating economic activity and energy

Study Figures 4a and 4b in the Resource Booklet. They show some information about data collection methods the students used and an extract from their questionnaire results.

> The aim of the students' enquiry was to investigate views on the development of a new line of electricity pylons on the edge of a town in Kenya.

(a) State **one** health and safety risk that should have been considered for this enquiry.

(1)

(b) Identify **one** type of primary data collected by the students.

(1)

(c) Explain why the students may have chosen systematic sampling for the questionnaire.

(3)

(d) (i) Plot the data for Site 1, Question 3, from Figure 4b in the Resource Booklet, to complete the pie chart in Figure 4c in the Question Paper.

(2)

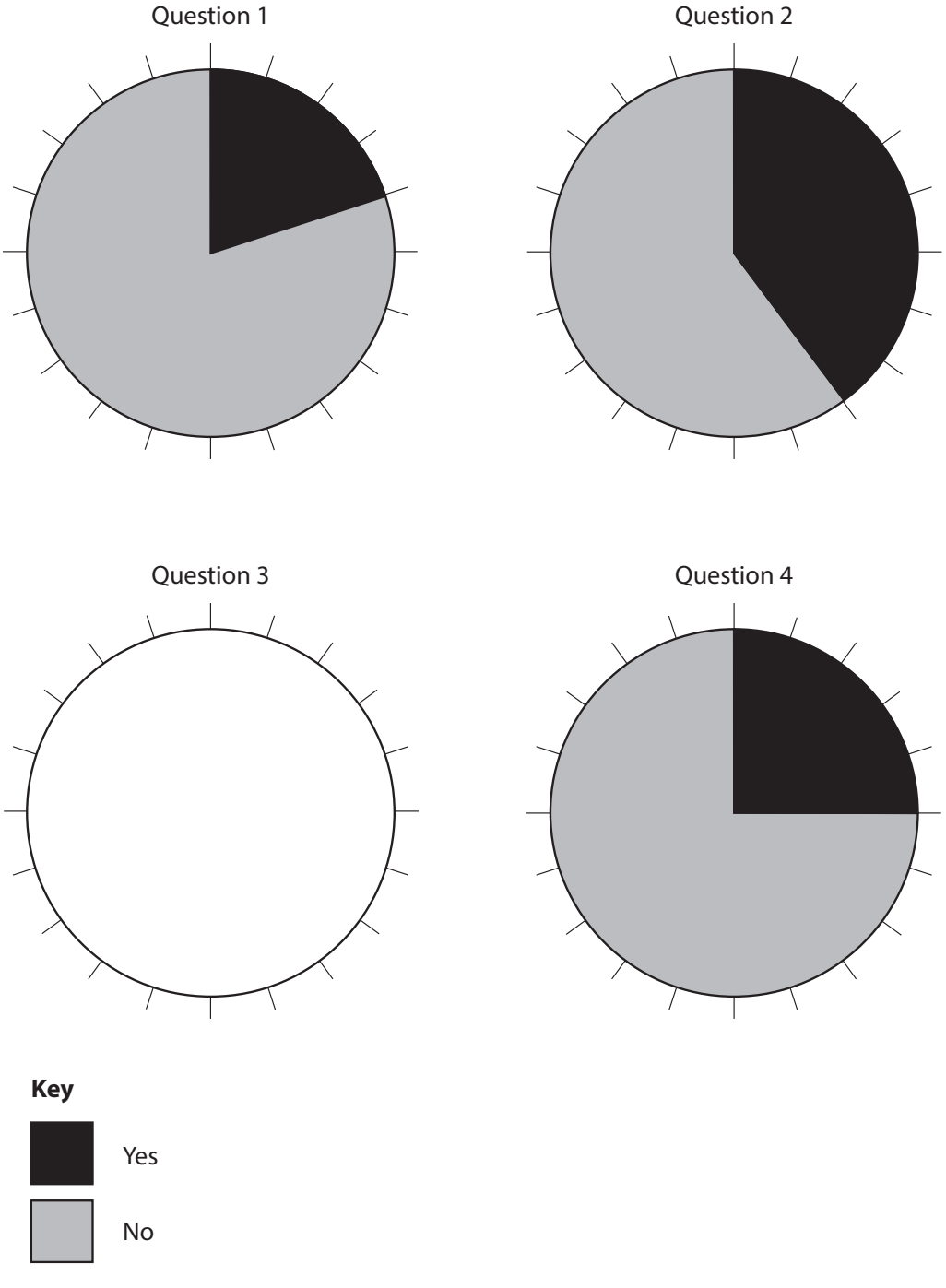


Figure 4c

Data presentation for Site 1

(ii) State **one** advantage and **one** disadvantage of the data presentation method used in Figure 4c.

(2)

advantage

disadvantage

(iii) State **one other** data presentation method that could have been used for the data shown in Figure 4c.

(1)

(iv) Calculate the mean response for the number of people who responded 'Yes' to Question 2.

You **must** show all your workings.

(2)

(e) You have studied economic activity and energy as part of your own geographical enquiry.

Evaluate the importance of quantitative data in helping you reach your conclusions.

(8)

State the title of your geographical enquiry

	Data collection methods	Details
1	• Environmental quality survey	• Conducted in three locations in the town.
2	• Questionnaires	• 20 people in each location asking every 10th person walking past.
3	• Photographs	• Taken at each site for environmental quality survey and where questionnaires collected.
4	• Information on the new pylons produced by the energy company.	• Websites and leaflets about the benefits of the new pylons.
5	• Data on the number of electricity pylons.	• Data available for 2014 to 2024.

Figure 4a

Data collection methods used

Question		Responses (%)					
		Site 1		Site 2		Site 3	
		Yes	No	Yes	No	Yes	No
1	Do you live near one of the new electricity pylons?	20	80	0	100	10	90
2	Do you know other people who live near the new electricity pylons?	40	60	20	80	50	50
3	Do you think the government should be building new electricity pylons?	95	5	80	20	75	25
4	Do you think the new electricity pylons are damaging the landscape?	25	75	50	50	40	60

Figure 4b

Extract from questionnaire results

MARK SCHEMES

official Pearson Edexcel mark schemes

1(a)	**AO1 (1 mark)** C a classification system for types of employment C is the correct answer as the other options do not related to economic sectors.	**(1)**

Question number	Answer	Mark
1(b)	**AO1 (1 mark)** D primary D is the correct answer since the other options exclude agriculture as part of their activity mix.	**(1)**

Question number	Answer	Mark
1(c)	**AO1 (1 mark)** Award 1 mark for any of the following. • the basic material from which a product is made (1). • natural resources which are unprocessed (1). • an unrefined material straight from source / in its natural state (1). • natural resources for use / processing by the secondary sector (1). • naturally occurring (resource) used to make another product (1). Accept any other appropriate response, including forms of energy e.g. crude oil, coal etc. Response must include and idea of it being unprocessed, raw, unfinished or going to be used by the secondary sector for credit.	**(1)**

Question number	Answer	Mark
1(d)	**AO3 (1 mark) / AO1 (1 mark)** Award 1 mark (AO3) for evidence from the image and a further mark (AO2) for extension through explanation, up to a maximum of 2 marks: • There are street sellers selling fruit next to a car (1) as they do not have a fixed building to sell produce from (1) • In the foreground there is a man on a bike carrying goods (1) because the economy is still reliant on the cash economy (1). Accept any other appropriate response. Note evidence must be directly from photograph, not assumed.	**(2)**

Question number	Answer	Mark
1(e)	**AO1 (1 mark)** Award 1 mark for any of the following. • Wind / wind turbines / wind power (1) • Solar / solar PV / solar power / solar energy (1) • Biomass / wood (1) • Geothermal (1) • Hydro / pumped storage / HEP (1) • Tidal (1) Accept nuclear.	**(1)**

Question number	Answer	Mark
1(f)	**AO2 (4 marks)** Award 1 mark for a reason and a further expansion mark, up to a maximum of 2 marks each. • Availability of energy resources (1) places which have a lot, e.g. oil, often consume in high amounts (1). • Price of energy (1) will impact on supply and demand within a region or country (1). • Some places countries have larger populations (1) therefore will demand more energy (1). • In some hot countries, they require more cooling (1) so more energy is needed to operate fridges and air-conditioning (1). Accept any other appropriate response, e.g. related to level of development.	**(4)**

Question number	Answer	Mark
1(g)	**AO1 (1 mark) / (AO3) 2 marks** Award 1 mark (AO1) for a basic reason and a further 2 marks (AO3) for extension through explanation or description, up to a maximum of 3 marks. • The big increase between 2020 and 2040 350-475 BTU (1) due an increase in global population (1) which means overall there will be a substantial increase in consumption (1). • The big increase between 2020 and 2040 350-475 BTU (1) due an increase in consumption per head (1) a people become wealthier they generally have more appliances and devices which use more energy (1). • Asia shows the biggest overall increase approx. 200 t0 300 BTU over 2020-2040 (1) this may be caused by the continued growth in manufacturing (1) which uses large amounts of energy in the process (1). Accept any other appropriate response. **Note: data not required as part of response.**	**(3)**

Question number	Answer	Mark
1(h)	**AO2 (4 marks)** Award 1 mark for initial explanation and an additional 1 mark for development through further explanation or exemplification. **Maximum of 2 marks when no named developing country is used in context, or a developed country is used instead.** A range of countries and examples could be chosen, based on either social, economic or environmental problems. • In China the government have promoted the use of coal to generate electricity (1) this is because there is an energy gap and coal is plentiful within China (1). • People in China have become wealthier and now many people have cars which need fossil fuel as a source of energy (1). The increased use of cars is contributing to a range of local as well as national pollution issues alongside worries about enhanced greenhouse effect (1). • In China the government has recently encouraged new heavy manufacturing plants to relocation in some cities that are rapidly growing (1) therefore increasing the demand for electricity to run the machinery which is causing local air pollution issues (1). Accept any other appropriate response. **Note: Accept a city, e.g. Hong Kong can be accepted as China.**	**(4)**

Question number	Indicative content
1 (i)	**AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include: **AO3** • The primary sector is working with natural resources which includes farming, fishing, forestry mining and quarrying. • The quaternary sector is involved in information and communications as well as R&D and development. Universities are an important part of this sector.

	• The relative importance of primary and quaternary sectors (together with secondary and tertiary) is a good indicator of the level of economic development. • In general terms a LHD / developing economy relies heavily on the primary sector, whereas a county with VHHD has a recently, but rapidly growing quaternary sector. • Sectoral shifts are wedded to the development process (pathway) and it is a result of several other factors that come into play, including rural-urban migration, increasing wealth as well as wider considerations such as globalisation and developments in ICT. **AO4** • Figure 1c shows the decrease in primary from the pre-industrial, to industrial to post-industrial stages. • On Figure 1c, it can be seen that the most dramatic (steepest) drop in employment occurs for the primary sector during the industrial phase. • Figure 1c shows that absolute decline in numbers employed in primary sector, post-industrial, are relatively low. • Figure 1c shows that the in the post-industrial phase there is a growth of quaternary, starting from a 0 base. • Overall the percentage employed in quaternary remains low in the post-industrial, peaking at about 5% Note only credit information and discussions around primary and quaternary employment.	
Level	**Mark**	**Descriptor**
	0	No rewardable material.
Level 1	**1–3**	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	**7–8**	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises

		relevant understanding coherently leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Question number	Answer	Mark

1(a)	**AO1 (1 mark)** A pre-industrial A is the correct answer as the other options do not relate to the correct stage with agriculture.	**(1)**

Question number	Answer	Mark
1(b)	**AO1 (1 mark)** Award 1 mark for any of the following. • How the workforce is divided up between the three main employment sectors - primary, secondary and tertiary. (1). • The proportions / percentage of people in the primary, secondary and tertiary workforce. (1). Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
1(c)	**AO1 (1 mark)** C Secondary C is the correct answer as the other options do not include manufacturing.	**(1)**

Question number	Answer	Mark
1(d)	**AO3 (1 mark) / AO1 (1 mark)** Award 1 mark (AO3) for a reason from the resource and a further mark (AO1) for extension through explanation, up to a maximum of 2 marks: • Tertiary and quaternary is the largest sector (1) because they have a well-educated labour force (1). • 27% of manufacturing (secondary) is the highest (1) because Turkey is developing its manufacturing economy as part of its industrialisation (1). • Primary, e.g. agriculture is nearly ¼ of the GDP (1) because the economy is still reliant on the primary sector (1).	**(2)**

	• Globalisation has allowed the country to received more foreign investment (1) causing the growth of the tertiary and quaternary sectors (1). Accept any other appropriate response, e.g. growth in air travel, tourism, containerisation, high skilled workforce, rural urban migration etc. **Note: Just stating the data, with no reason can get 1 mark.**	

Question number	Answer	Mark
1(e)	**AO1 (1 mark)** Award 1 mark for any of the following. • Coal (1) • Oil / Tar sands (1) • Natural gas (1) • Shale gas (1) Accept nuclear.	**(1)**

Question number	Answer	Mark
1(f)	**AO2 (2+2 marks)** Award 1 mark for a reason and a further expansion mark, up to a maximum of 2 marks each. • Availability of energy resources (1) places which have a lot, e.g. oil, often consume in high amounts as its cheaper (1). • Price of energy within a country (1) will impact on supply and demand within a region or country (1). • Some places countries have larger populations (1) therefore will demand more energy (1). • In some hot countries, they require more cooling to keep people comfortable (1) so more energy is needed to operate fridges and air-conditioning (1). Accept any other appropriate response, e.g. factors such as population density.	**(4)**

Question number	Answer	Mark
1(g)	**AO1 (1 mark) / (AO3) 2 marks** Award 1 mark (AO3) for an idea from the resource and a further 2 marks (AO2) for extension through explanation, up to a maximum of 3 marks. • Employment costs may be cheaper overseas (1) due to the workforce being based in an emerging economy country (1) which means the manufacturer saves overall costs (1). • Advances in technology have allowed manufacturing to relocate overseas (1) which has stimulated the growth of new jobs in this industry (1) but still maintained the quality of the finished product (1). • Places such as China offer car manufacturers new markets (1) so they can sell more vehicles when manufactured locally (1) and ultimately make more profit for shareholders (1). • Fords preference for China rather than Mexico is due to costs of production (1). China has a large labour supply and can offer competitive labour rates (1) so Ford is making a decision to move to the lowest cost country to maximise returns (1). Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
1(h)	**AO2 (4 marks)** Award 1 mark for initial explanation and an additional 1 mark for development through further explanation or exemplification. **Maximum of 2 marks (1 per way) when no named developing / emerging country is used in context, or a developed country is used instead.** A range of countries and examples could be chosen, based on either increasing production, switching to using "greener" approaches, or reducing demand, e.g. with policies and incentives. • In China the government have promoted the use of solar panels to generate electricity (1) this is because they are environmentally low carbon and cheaper than non-renewable energy (1).	

	• China have become much more energy self-sufficient through the use of government polices to encourage HEP (1). This is a cleaner technology which doesn't reply on harmful fossil fuel combustion (1). • In Bejing (China) the government has recently encouraged all new buildings to have better insulation for hot summer temperatures (1) therefore reducing electricity demand for electric A/C in the summer (1). Accept any other appropriate response. **Note: Accept a city, e.g. Mumbai can be accepted as India.**	**(4)**

Question number	Indicative content
1 (i)	**AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include: **AO3** • Malthus thought that if the human population continued to grow, food production would not be able to keep up with demand and there would not be enough food to go around. The result, he warned, would be a terrible famine that would kill many people. • Boserup suggested that food production can, and will, increase to match the needs of the population - Boserup described this change as 'agricultural intensification'. • Boserup used her knowledge of farming in the developing world, where populations were growing quickly, Boserup argued that the threat of starvation and the challenge of feeding more mouths motivates people to improve their farming methods and invent new technologies in order to produce more food. • In contrast Malthus was arguing that the human population was at risk of outgrowing its carrying capacity (the number of individuals that can be supported by a specific habitat). At the time when he was writing the Industrial Revolution had not yet arrived, and without developments such as pesticides and fertilisers the amount of food that could be produced per acre of land was much smaller than it is today.

	AO4 • Figure 1c shows the differences between two population theories, with both increasing demand for food and a growing population. • On Figure 1c, it can be seen that the models are very different to each other, with different assumptions about futures. • Figure 1c shows that Malthus assumes a linear or steady relationship between population and food resources, but where the population line (red) intersects the model (green line) then there is a collapse or catastrophe. • Figure 1c shows that the Boserup theory indicates that the food resource can keep pace with the increase in population, and the red line never intersects the blue line of the model. • Overall the population increases at an exponential rate.	
Level	**Mark**	**Descriptor**
	0	No rewardable material.
Level 1	**1–3**	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	**7–8**	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Question number	**Answer**	**Mark**

1(a)	**AO1 (1 mark)** C energy from plants C is the correct answer as the other options are not related to biomass, i.e. biotic sources.	**(1)**

Question number	Answer	Mark
1(b)	**AO1 (1 mark)** • The effort made to reduce the consumption of energy by using less of an energy source (1). • Reducing the amount of energy (coal / power / electricity etc) that is used by people in their homes or industry or transport (1). Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
1(c)	**AO1 (1 mark)** D burning natural gas D is the correct answer as the other options are renewable sources of energy	**(1)**

Question number	Answer	Mark
1(d)	**AO2 (1 mark) / AO3 (1 mark)** Award 1 mark for a basic evidence from the from the photo (AO3) and a further 1mark for extension through explanation (AO2), up to a maximum of 2 marks. • Looks like a well-protected deep-water port, e.g. harbour wall (1) so that large cargo ships can move / transport / unload freight (1). • Sea port for unloading container boxes (1) as it is likely to be an accessible location, e.g. by road (1). • Cranes for unloading containers (1) as it may be easy to transport them from here either by road, sea or rail (1) • Flat area for unloading (1) meaning that boxes / freight can be easily stored (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
1(e)	**AO1 (1 mark)** Award 1 mark for a suitable type of primary sector employment identified. • Farming (1) • Fishing (1) • Forestry (1) • Mining (1) Accept other specific jobs relevant to this sector, i.e. extractive industries.	**(1)**

Question number	Answer	Mark
1(f)	**AO2 (2+2 marks)** Award 1 mark for a reason and a further expansion mark, up to a maximum of 2 marks each. • Increasing population (1) means that there is a greater demand for resources, e.g. food (1). • There is a strong relationship between population and resources (1) The growth and decline of population directly affects the use of resources (1). • The availability of natural resources, e.g. food availability (1) controls population growth rates by influencing health and fertility (1). • Malthus's theory states that population would grow exponentially (1) whereas food production would grow more slowly (linear growth) (1). Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
1(g)	**AO1 (1 mark) / (AO3) 2 marks** Award 1 mark for an identification of the change taking place and a further 2 marks for explanation of a reason, up to a maximum of 3 marks. • The decline in manufacturing employment for most countries, e.g. UK -47% (1) due to shifts away from labour-intensive industries (1) into higher tech and service sector-based industries (1). • The decline in manufacturing employment for most countries, e.g. Germany -24% (1) due to shifts into low cost countries, e.g. Indonesia, Thailand, Vietnam (1) where companies can be more productive and profitable (1). • Increased automation of tasks in manufacturing leads to decline in employment, e.g. France -34% (1) means that many economies need less workers to achieve comparable outputs (1) so employment rates decline (1). • South Korea and Taiwan has seen increases – 2% + 12% (1) due to government policy (1) encouraging training as well as supporting industries with tax breaks (1). Accept any other appropriate response. Must use evidence from the resource.	**(3)**

Question number	Answer	Mark
1(h)	**AO2 (2+2 marks)** Award 1 mark for a reason and a further expansion mark, up to a maximum of 2 marks each. Maximum 2 marks if no named megacity, or incorrect city named. • [Kolkata, India] Workers in the informal tertiary sector choose this way of working (1) as it means they will have to pay less / no tax to the government (1). • [Jakarta, Indonesia] Lack of government authority or government corruption means that the state is unable to manage the informal sector efficiently (1) so many people are able to work in the informal sector without having to pay tax (1). • [Karachi, Pakistan] Large rural – urban migration in some countries means there are not enough legal / regular paid jobs in some cities (1) so workers are forced into informal employment (1). Accept any other appropriate response.	**(4)**

Question number	Indicative content
1 (i)	**AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. Candidates don't need to cover all energy types to reach level 3, but do need to include both renewable and non-renewable energy. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include: **AO3** • The energy mix of a country / globally is the specific combination of different energy sources it uses to meet its energy consumption needs. • The change in the energy mix is a result of several separate and interrelated factors including energy / resource price, local availability, national and international government agreements, public attitudes, level of development and local geographies. • An important factor is how energy is used in transport, in the future oil will decrease due to a switch towards more efficient and electric cars. This may also be driven by higher energy prices. • Government attitudes and policies towards renewable energy (especially large countries and populous such as China and India) will be very important in determining the future energy mix. • Energy efficient and public attitudes in some places (e.g. California) will affect the future energy mix through political pressure in countries such as USA. • Future prices of different energy sources e.g. natural gas and oil, as well as energy security of supplies and geopolitical concerns will also be important. **AO4** • Figure 1c shows that coal historically has been a main component of the global energy mix. • On Figure 1c, it can be seen that in the future coal will decline to around 30% of global energy mix by 2040. • Figure 1c shows that renewable will be very important in the future, expected to be approaching 25% of total energy mix by 2040.

	• Figure 1c shows that gas will remain constant from 2010 to 2040 whilst nuclear will drop from high levels in the 1990s to around 10% in 2040. • Figure 1c shows oil will have the biggest relative drop in use from a high of around 20% in 1970 to just 1-2% in 2040.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	**1–3**	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	**7–8**	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Question number	Answer	Mark

1(a)	**AO1 (1 mark)** C natural gas that is trapped within shale formations The answer cannot be A (coal), B or D (these are incorrect).	**(1)**

Question number	Answer	Mark
1(b)	**AO1 (1 mark)** • the goal to reduce the amount of energy required to provide products and services. (1) • reducing the amount of energy (coal / power / electricity etc) that is used by people or industry or transport. (1) Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
1(c)	**AO1 (1 mark)** A hydroelectric power The answer cannot be B, C or D as these are all non-renewable sources of energy.	**(1)**

Question number	Answer	Mark
1(d)	**AO2 (1 mark) / AO3 (1 mark)** Award 1 mark for a basic evidence from the from the graph (AO3) and a further 1mark for extension through explanation (AO2), up to a maximum of 2 marks. • There is an increase in the population (1) because over time less people will die from disease as healthcare improves (1). • There is a rapid rise in population (1) as there is greater food availability for the population (1). • There is a steep rise in population (1) as people become wealthier it means they can buy more food (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
1(e)	**AO1 (1 mark)** Award one mark for suitable example of secondary employment. • Manufacturing jobs (1). • Jobs in an industrial setting (1). Accept other specific jobs relevant to this sector, e.g. steel worker	**(1)**

Question number	Answer	Mark
1(f)	**AO2 (2+2 marks)** Award 1 mark for a reason and a further expansion mark, up to a maximum of 2 marks each. Maximum of 2 marks when no named megacity is not used in context. • Work not regulated by the government (1) which is often low paid and insecure (1). • Work not protected by the state (1) which is often a form of self-employment (1). • A part of the economy not taxed or monitored by the government (1) therefore it is not included in a countries GDP or GNP (1). • Work which might be dangerous / undesirable (1) so only the poorest parts of society have to undertake it (1). Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
1(g)	**AO1 (1 mark) / (AO3) 2 marks** Award 1 mark (AO3) for a basic reason and a further 2 marks (AO2) for extension through explanation or description, up to a maximum of 3 marks. • Low carbon emissions (1) due to the fact that that there is no combustion of fossil fuels (1) which means that it does not contribute to climate change directly (1). • Compared to other sources of energy wind power is cheaper (1) which has stimulated the growth of new jobs in this sector (1) and encouraged the development of associated employment supporting this industry (1). • Wind turbines do not create particulate pollution (1) which is associated with power generation in coal-fired power stations (1) and ultimately should improve local levels of air quality (1). Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
1(h)	**AO2 (2+2 marks)** Award 1 mark for a reason and a further expansion mark, up to a maximum of 2 marks each. • Some countries are more populous than others (1) so this means their total energy demand will vary according to the population size (1). • Generally, increasing wealth of a country means that their energy demand rises (1) so the richest countries will have a greater demand for energy (1).	

	• Some countries have natural energy resources, e.g. Iceland (geothermal) which promotes their usage (1) as consumers can have energy supplied at a lower cost (1). Accept any other appropriate response.	**(4)**

Question number	Indicative content
1 (i)	**AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include: **AO3** • The decline in manufacturing as a share of GDP is a phenomenon experienced in many richer countries. Partly, this reflects rising real wages, meaning comparative advantage shifts away from labour-intensive industries to higher tech and service sector-based industries. • Increased automation of tasks in manufacturing means that many economies need less workers to achieve comparable outputs. • Some governments have been blamed for either the loss or gain in manufacturing employment. Roles in providing training and skills as well as tax breaks and benefits for manufacturing businesses. • Government macro-economic policy – relying too heavily on consumer spending to support economic growth rather than encouraging manufacturing business development, e.g. supported by infrastructure. • Manufacturing decline is relative, some may argue that manufacturing output (not jobs) has increased in many economies in real terms. • South Korea has a competitive manufacturing base with good exports and it has avoided de-industrialisation at the

	same rate as many other economies. **AO4** • Figure 1c shows the variations between positives and negatives (percentages) in the changes in manufacturing employment. • On Figure 1c, it can be seen that most countries have experienced overall decline in the amount of manufacturing employment (-4 to -16%) • Figure 1c shows that Sweden and Italy have had the largest fall in manufacturing employment, 16 and 15% respectively • Figure 1c shows that South Korea is an anomaly with a large 21% increase in manufacturing employment • Taiwan and Germany have seen modest rises in manufacturing employment, 6 and 1% respectively.	
Level	**Mark**	**Descriptor**
	0	No rewardable material.
Level 1	**1–3**	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	**7–8**	• Applies understanding to deconstruct information and provide logical connections between concepts

		throughout. A balanced, well-developed argument that synthesises relevant understanding coherently leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Question number	Answer	Mark

1(a)(i)	**AO1 (1 mark)** Award 1 mark for a suitable definition. • The abililty to provide sufficient, affordable and consistent energy supplies to match demand (1). • The ability of a country to secure sufficient, affordable and consistent energy supplies (1). Accept any other appropriate response which refers to just one aspect of energy security.	**(1)**

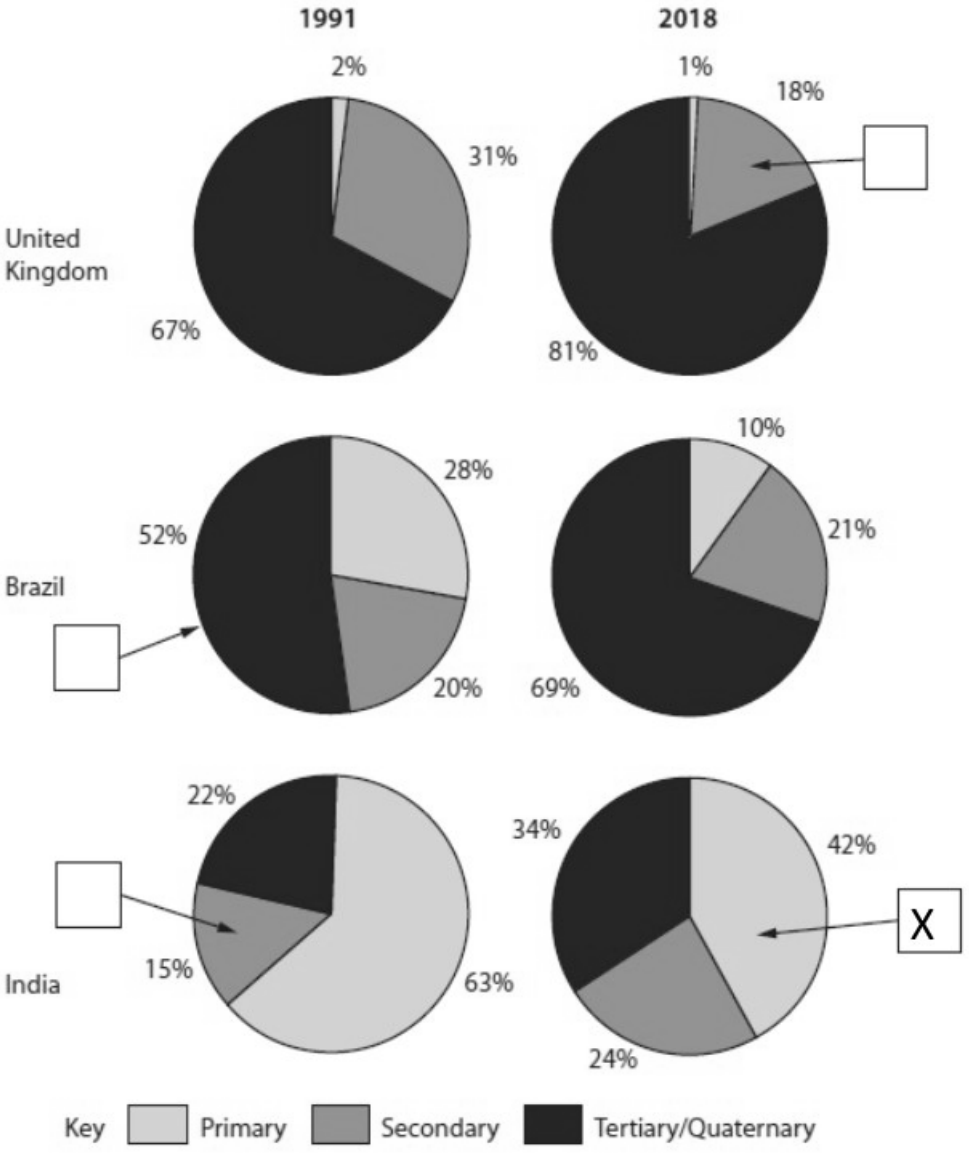
Question number	Answer	Mark
1(a)(ii)	**AO1 (2 marks)** A - Coal (1) D - Oil (1) B, C, E, and F are incorrect as they are renewable sources of energy.	**(2)**

Question number	Answer	Mark
1(b)	**AO2 (1 mark) / A03 (1 mark)** Award 1 mark for identification of adaptation method evident from the photograph (AO3), and a further 1 mark for extension through explanation (AO2), up to a maximum of 2 marks. • Solar panels (1) have been installed to reduce reliance on energy from the national grid (1). • Large windows (1) to maximise temperature gains from sunlight during the day (1). • Double glazed windows / curtains or blinds (1) to reduce loss of heat through windows (1). Accept any other appropriate response.	

	Evidence must be plausibly inferred from the photograph, e.g. windows likely to be double-glazed.	**(2)**

Question number	Answer	Mark
1(c)(i)	**AO1 (1 mark)** Award 1 mark for any of the following: • Usually involves provision of services. (1) • Can involve selling goods and products from primary and secondary industries. (1) • Dominant in developed countries. (1) • Workers usually need to be highly skilled /qualified. (1) • White-collar workers. (1) Do not accept a job that would usually be found in the tertiary sector unless it linked to a characteristic e.g. teacher working in a school, providing education. Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
1(c)(ii)	**AO2 (2 + 2 marks)** Award 1 mark for a suitable factor that affects the location of tertiary industries, and a further mark for a development of this point, up to maximum of 2 marks per explanation. • Transport links (1) to ensure workers can access the site. (1) • Fast communications provision (1) as usually telecommunications are an important component of operations. (1) • Access to skilled labour (1) to ensure suitable workers are available. (1) • Reliable power supply (1) as often this is needed for technology involved. (1) • Access to market (1) to ensure it remains profitable. (1) Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
1(d)(i)	**AO3 (1 marks)** Award 1 mark for: Box pointing to India in 2018.  	(1)

Question number	Answer	Mark
1(d)(ii)	**AO3 (1 mark)** B - India's employment in tertiary/quaternary sectors has increased by 12 percentage points (1). All the other options are incorrect.	**(1)**

Question number	Answer	Mark
1(d)(iii)	**AO2 (1 mark)** Award 1 mark for a suitable reason. • Increased mechanization. (1) • Industrialisation. (1) • Rural to urban migration. (1) • Exhaustion of raw materials. (1) • Increased level of education for local population. (1) Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
1(e)	**AO2 (4 marks)** Award 1 mark for identification of an advantage of informal employment and an additional 1 mark for development through further explanation or exemplification. Maximum of 2 marks when no named megacity. Responses will vary depending on megacity chosen. • [Mumbai] ○ Working as a rickshaw driver provides opportunity for income (1) without having to pay taxes (1). ○ Selling street food in Dharavi but without needing a fixed building to sell produce (1) which means they don't need to pay rent (1). Accept any other appropriate response.	**(4)**

Question number	Indicative content
1(f)	**AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include the following. **AO3** • As an emerging country China's energy use has been increasing at a rapid rate to fuel industrialisation and expansion of the economy. As countrys develop their need for energy grows. • China has also experienced rapid growth in population over the last few decades (981 million in 1980 to 1.37 billion in 2014). Such growth in population will cause an increase in energy demand. • As the country industrialises it has greater need for energy for industry and technology from coal power plants to high tech industries. • As the countries income rises, as indicated by GDP capita, populations often desire more consumer goods, many of which require energy in their manufacturing. • Increased wealth is often associated with increased car ownership for example which creates more demand for energy which given the size of China's population gives good justfication for the rate of growth shown in energy use. **AO4** • Figure 1c shows an increase in energy use and GDP per capita in China across several decades. • The two pieces of data follow a similar trend of slow growth in the 1980s and 1990s. • Energy use begins to rapidly increase in 2000, followed by GDP in 2005. • Figure 1c shows how the rate of growth of GDP has been rapid for China since 2005. • The rate of growth for energy use has slowed down slightly 2010-2014.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	**1–3**	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	**7–8**	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Question number	Answer	Mark

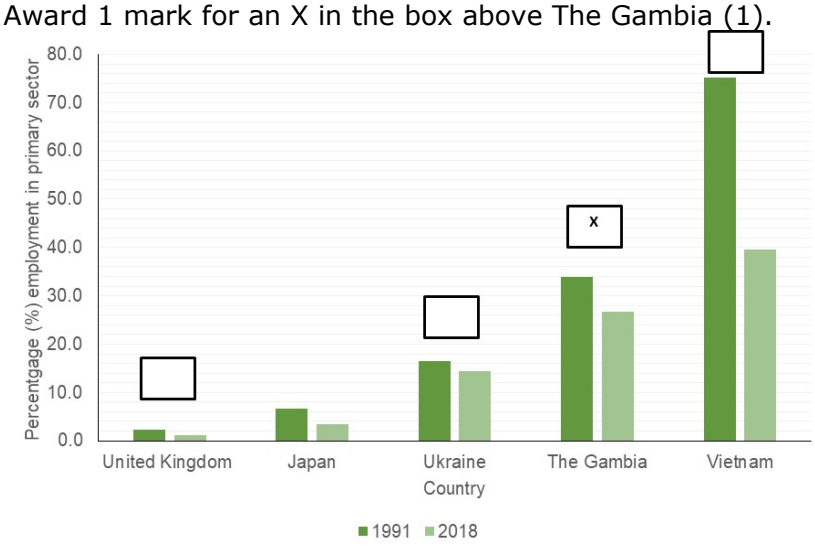
1(a)(i)	**AO1 (1 mark)** • The difference between a country's rising demand for energy and its ability to produce that energy from its own resources (1). Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
1(a)(ii)	**AO1 (2 marks)** E Solar F Wind A, B, C, and D are all incorrect as they are non-renewable forms of energy.	**(2)**

Question number	Answer	Mark
1(b)	**AO2 (1 mark) / A03 (1 mark)** Award 1 mark for identification of adaptation method evident from the photograph (AO3), and a further 1 mark for extension through explanation (AO2), up to a maximum of 2 marks. • Runs on electricity (1) and so has reduced CO2 emissions compared to standard buses (1). • Reduces emissions of CO2 (1) as it uses a rechargable battery (1). • It does not require fossil fuels to run (1) as it runs on electrcity (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
1(c)(i)	AO1 (1 mark) Award 1 mark for any of the following: • Availability of suitable land (1). • Good transport connections (1) • Availability of labour (1). • Reliable power source (1). Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
1(c)(ii)	**AO2 (2 + 2 marks)** Award 1 mark for a suitable reason and a further mark for a development of this point, up to maximum of 2 marks per explanation. • Shift to tertiary sector industries (1) and a service based economy (1). • Global shift where secondary sector industries have moved (1) to countries where the labour and other costs are cheaper (1). • Reduced government support for secondary industries (1) which makes them less financially viable (1). Ideas around automation or reduced employment due to mechanization can be credited for 1 mark unless linked to developed idea of declining secondary sector. Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
1(d)(i)	**AO3 (1 marks)** Award 1 mark for an X in the box above The Gambia (1).  	**(1)**

Question number	Answer	Mark
1(d)(ii)	**AO1 (1 mark)** D Vietnam A, B, C are all incorrect as the changes in employment are much smaller than in Vietnam.	**(1)**

Question number	Answer	Mark
1(d)(iii)	**AO2 (1 mark)** • Mechanisation (1) • Industrialisation (1) • Rural-urban migration (1) • Increased education (1). Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
1(e)	**AO2 (4 marks)** Award 1 mark for identification of a disadvantage of informal employment and an additional 1 mark for development through further explanation or exemplification. Different megacities could be chosen. • Money earned from informal employment does not contribute to tax systems (1) so does not benefit overall economy (1). • Often involves unsafe work (1) and there are no regulations to protect workers in such conditions (1). • It is often poorly paid (1) and often holds no legal contract (1). • Does not provide the employee with health or unemployment benefits (1) and therefore does not provide security (1). • Where children are involved it prevents them from going to school (1) which damages their chance of gaining more skilled employment (1). Accept any other appropriate response.	**(4)**

Question	Indicative content

<table>
<tr><th>number</th><th colspan="2"></th></tr>
<tr><td>1(f)</td><td colspan="2">AO3 (4 marks)/AO4 (4 marks)

Marking instructions
Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below.

Indicative content guidance
The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include the following.

AO3
• Global energy production has changed over time due to the different development trajectories of countries, and an increased awareness of environmental consequences of energy use.
• As country's economic development increases as indicated by GDP per capita, this has usually been accompanied by a growth in energy consumption, particularly from fossil fuels.
• As sources of non-renewable fuels have been depleted, and the environmental consequences of using such fuels has been identified there have been efforts to shift towards the use of non-renewable energy sources.
• While overall energy consumption may have increased, the sources of where this electricity is produced has changed.
• International agreements which encourage governments to address energy production and climate change issues.

AO4
• Figure 1c shows a consistent increase in global GDP per capita across the time period.
• Figure 1c shows how GDP increases from around US$24,000 to US$56,000 during this time period.
• Figure 1c shows a slight increase in electricity production from renewable sources from around 2005.
• Figure 1 shows a decline in electricity production from coal since around 2000, and a more marked decrease from 2010.</td></tr>
<tr><th>Level</th><th>Mark</th><th>Descriptor</th></tr>
<tr><td></td><td>0</td><td>No rewardable material.</td></tr>
<tr><td>Level 1</td><td>1–3</td><td>• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3)
• Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)</td></tr>
</table>

Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	**7–8**	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Question number	Answer	Mark

Question Number	Answer	Mark
1(a) (i)	**AO1 (1 mark)** D It is a source of renewable energy (1) The answer cannot be A (solar power), B (wind power), or C (incorrect).	**(1)**

Question Number	Answer	Mark
1(aii)	**AO1 (1 mark)** • a source of energy that cannot be exhausted (1) • energy that can be used again and again (1) Accept any other appropriate response.	**(1)**

Question Number	Answer	Mark
1(b)	**AO1 (1 mark)** C Increasing the use of electric battery technology (1) The answer cannot be A, B or D as these all require increased resource consumption and therefore are not sustainable.	**(1)**

Question Number	Answer	Mark
1(c)(i)	**AO2 (1 mark) / AO3 (1 mark)** Award 1 mark for basic evidence from the figure (AO3) and a further 1 mark for extension through explanation (AO2), up to a maximum of 2 marks. • Selling food in the street (1) rather than in a designated market (1). • Stall does not look permanent (1) so it is probably not a designated shop space (1).	

	• There are no signs or labels for the goods being sold (1) which suggests there is no record of sales (1). Accept any other appropriate response.	**(2)**

Question Number	Answer	Mark
1(c)(ii)	**AO1 (1 mark)** Award 1 mark for a suitable advantage. • Often requires less skills/qualifications (1). • Unlikely to pay tax (1). • Requires little investment to set up informal business (1). • Reducing unemployment (1). Accept any other reasonable response.	**(1)**

Question Number	Answer	Mark
1(d)	**AO2 (2+2 marks)** Award 1 mark for a factor and a further expansion mark, up to a maximum of 2 marks each. • Increasing population (1) means that there is a greater demand for energy, e.g. petrol for cars (1). • Economic development can lead to more industry (1) which requires greater use of resources (1). • Awareness of climate change (1) can lead to an increase in demand for renewable energy sources (1). • Increased use of technology (1) leads to greater consumption of energy (1). Accept any other appropriate response.	**(4)**

Question Number	Answer	Mark
1(e)	**AO1 (1 mark) / (AO3) 2 marks** Award 1 mark (AO1) for a basic idea and a further 2 marks (AO3) for extension through use of the resource, up to a maximum of 3 marks. • Malthus's theory states that population would grow exponentially (1) whereas food production would grow more slowly (linear growth) (1). This would lead to population outstripping food growth (1). Accept any other appropriate response.	**(3)**

Question Number	Answer	Mark
1(f)	**AO2 (2+2 marks)** Award 1 mark for a reason and a further expansion mark, up to a maximum of 2 marks each. • Good transport connections (1) as companies need good access to road and rail connections to allow a skilled workforce to reach them. • Reliable internet access (1) as many companies rely on this to operate their business (1). • Proximity to a university (1) as they can provide a skilled workforce suitable for the sector (1). • Large area of land available (1) to allow room for growth (1). Accept any other appropriate response.	**(4)**

Question Number	Indicative content
1 (g)	**AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include: **AO3** • The relative size of secondary sector employment is a good indicator of economic development. • As a country becomes more developed, typically there will be a shift from primary sector employment to more secondary sector employment. • Countries which previously have been dominated by primary sector employment develop the capacity to process raw materials so they can gain more money from their sale and exports, than they would through the sale of raw materials. • In developed countries, as their economy advances there can also be a shift from secondary employment to more tertiary and quaternary employment. • In many developed countries there has been a decline in secondary sector employment as many of these jobs are now outsourced to countries with lower costs. **AO4** • Figure 1c shows that different countries have different trends for employment in the secondary sector. • Figure 1c shows that for developed countries such as the UK and the US, there has been a steady decline in the percentage employed in the secondary sector. • Figure 1c shows that Cambodia has experienced a steady rise in secondary sector employment. • Figure 1c shows how Ghana has only more recently experienced a rise in secondary sector employment compared to other countries shown, from around 2013. • Figure 1c shows how China has experienced different rates of growth in the percentage of the secondary sector, with more rapid rise from around 2001-2012.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–3	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	4–6	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	7–8	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

1(a)(i)	**AO1 (1 mark)** D Burning it releases CO2 (1) The answer cannot be A (refers to oil), B (an advantage), C (incorrect).	**(1)**

Question number	Answer	Mark
1(a)(ii)	**AO1 (1 mark)** • Energy produced from resources that cannot be replaced once they are used (1). • Energy produced from fossil fuels (1). Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
1(b)	**AO1 (1 mark)** D Use more renewable energy (1) It cannot be A, B or C as these would make a factory less sustainable.	**(1)**

Question number	Answer	Mark
1(c)(i)	**AO2 (1 mark) / AO3 (1 mark)** Award 1 mark for basic evidence from the from the photograph (AO3) and a further 1 mark for extension through explanation (AO2), up to a maximum of 2 marks. • People are involved in farming which is in the primary sector (1) they are ploughing prior to transplanting (1).	

	• It involves farming (1) and is labour intensive (1). • Primary sector involves extraction of raw materials (1) here they are preparing the land to grow crops (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
1(c)(ii)	**AO1 (1 mark)** Award 1 mark for a suitable raw material. • Coal/Oil/Gas (1) • Fish (1) • Crops (1) • Timber/Wood (1) Accept other suitable raw materials.	**(1)**

Question number	Answer	Mark
1(d)	**AO2 (2+2 marks)** Award 1 mark for a reason and a further expansion mark, up to a maximum of 2 marks each. • Availability of natural resources (1) if new sources of oil are found then production will continue to go up (1). • If demand shifts to more renewable energy sources (1) then efforts will be made to produce more, leading to less demand for non-renewable sources (1). • Conflict in areas that produce energy resources (1) can lead to disrupted production and lower levels of production overall (1). Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
1(e)	**AO1 (1 mark) / (AO3) 2 marks** Award 1 mark (AO1) for a basic idea and a further 2 marks (AO3) for extension through use of the resource, up to a maximum of 3 marks. • Boserup believed that as the population grew people would always find ways for food production to be higher than needed, (1) as people would invest in new ways to increase food supply (1) e.g. chemical fertilisers to improve yield (1). Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
1(f)	**AO2 (2+2 marks)** Award 1 mark for each factor and a further expansion mark, up to a maximum of 2 marks each. • Good transport facilities (1) to ensure goods produced can reach the market efficiently (1). • Access to reliable supplies of electricity (1) to ensure production of goods is not disrupted (1). • Access to labour force (1) to ensure that there are sufficient workers to enable production (1). • Proximity to raw material (1) as they are heavy to transport (1). • Availability of land (1) as they may need room to expand (1). Accept any other appropriate response.	**(4)**

Question number	Indicative content
1 (g)	**AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include: **AO3** • The employment structure of a country is often related to the development stage of a country. • The change in employment structure according to the Clark Fisher model means countries move to higher proportions of tertiary sector employment in the post-industrial phase, with increasing amounts of tertiary sector employment in the industrial phase while primary and secondary sectors experience relative decline. • Tertiary sector employment involves providing services, this can include commercial (e.g. retail), professional (e.g. legal services), social (e.g. education/healthcare), entertainment (e.g. cinemas) or personal (e.g. hairdressers). • Developing or emerging countries are likely to be in the industrial phase where there is a rise in the tertiary industry, with some moving to the post industrial phase. **AO4** • Figure 1c shows the percentage of employment in the tertiary sector for a range of developed, developing and emerging countries. • On Figure 1c it can be seen that developed countries such as Japan have had a high proportion of tertiary sector employment since 1991 with further increases to over 70% by 2019. • Figure 1c shows how some countries such as Cambodia have had a larger increase in the proportion of employment in the tertiary sector since 1991, an increase of around 25 percentage points. • Figure 1c shows that while some countries have experienced a steady increase in tertiary sector employment, others have had

		more variable rates of change. For example, Egypt which rose until around 2003, had a small decline to 2008 and then slowly increasing again to 2019.
Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–3	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	4–6	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	7–8	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Question number	Answer	Mark

1(a)(i)	**AO1 (1 mark)** C Can be used in most areas of the world. (1) The answer cannot be A (refers to wind turbines), B (refers to tidal), or D (incorrect).	**(1)**

Question number	Answer	Mark
1(a)(ii)	**AO1 (1 mark)** Award 1 mark for a suitable definition. • A renewable energy source that uses heat from underground (1). • Heat and steam from underground that is used to drive turbines (1). Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
1(b)	**AO1 (1 mark)** B The difference between a country's energy demand and its ability to produce it. (1) It cannot be A, C or D as these are not the correct definitions of an energy gap.	**(1)**

Question number	Answer	Mark
1(c)	**AO2 (1 mark) / AO3 (1 mark)** Award 1 mark for a basic evidence from the from the photograph (AO3) and a further 1 mark for extension through explanation (AO2), up to a maximum of 2 marks. • It is close to water (1) so boats can be used to transport raw materials or final products (1). • There are green spaces around (1) so there is room for expansion (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
1(d)	**AO1 (1 mark)** Award 1 mark for a suitable economic activity. • Farming/agriculture (1) • Mining (1) • Forestry (1) • Fishing (1) Accept other specific jobs relevant to this sector	**(1)**

Question number	Answer	Mark
1(e)	**AO1 (1 mark) / (AO3) 2 marks** Award 1 mark for identifying a change as shown in the resource. Award 1 further mark for explanation of the reason, or use of relevant data to support. • A rise in secondary sector employment e.g. Vietnam (1) due to industrialisation (1) as country becomes more developed (1). • • A decline in secondary sector (1) due to a shift in manufacturing to developing or emerging countries (1) where costs of production, particularly labour, can be lower (1). • A decline in secondary sector employment (1) due to mechanisation in some industries (1) which means that less people are needed in the factories and are forced to look for other work (1). • Decline in Germany (1) due to deindustrialisation (1) goes from 37.5% to 27% (1). Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
1(f)	**AO2 (2+2 marks)** Award 1 mark for each advantage or disadvantage and a further expansion mark, up to a maximum of 2 marks each. Advantages: • For countries with large supplies of fossil fuels it is a reliable source of energy (1) which does not need new infrastructure like renewable energy (1). • Some non-renewable energy sources like oil are affordable (1) and so can be used to fuel vehicles which people need for their daily lives (1). Disadvantages: • Burning fossil fuels can lead to CO2 emissions (1) which contribute to the enhanced greenhouse effect (1). • Buring coal can release sulphur dioxide (1) which can cause respiratory problems/contribute to acid rain (1). Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
1(g)	**AO2 (2+2 marks)** Award 1 mark for each suitable way suggested and a further mark for expansion, up to a maximum of 2 marks each. Maximum 2 marks if developing/emerging country provided. If no country provided but relevant content for a developed country then award up to max marks. A range of country examples could be provided • UK: ○ Investment in a sustainable energy system (1) which includes increased investment in renewable energy technology (1). ○ Focus on international relations (1) to ensure it is possible to maximise access to resources of energy from outside the UK (1). Answers could focus on how different countries are trying to: improve resilience of their energy supply, encourage energy efficiency, maximise production of energy (renewable and non-renewable), but also reducing dependence on fossil fuels. Accept any other appropriate response.	**(4)**

<table>
<tr><th>Question number</th><th colspan="2">Indicative content</th></tr>
<tr><td>1 (h)</td><td colspan="2">AO3 (4 marks)/AO4 (4 marks)
Marking instructions
Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below.

Indicative content guidance
The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include:

AO3
• Informal employment is part of the economy is that is unofficial, unregulated and untaxed and is prevalent across the globe, but with significantly higher levels in developing and emerging economies.
• Employment in the informal economy tends to be much higher in developing or emerging countries for a number of reasons:
○ High levels of rural-urban migration can mean there are not enough formal opportunities.
○ In some cases wages in formal employment are not enough to maintain a suitable quality of life so family members seek informal employment in order to supplement family income.
• In developed countries there are usually more regulations around employment, and enforcement of them which means in regions like Europe and the Americas (most likely USA & Canada) there are much lower levels of informal employment.

AO4
• Figure 1c shows the percentage of informal and formal employment in different global regions in 2018.
• On Figure 1c it can be seen that regions with a higher proportion of developed countries (Europe & Central Asia) have a much lower proportion of informal employment (around 20%).
• Figure 1c shows how three global regions (Africa, Arab states and Asia & the Pacific) have around 80% of employment that is informal.
• Figure 1c shows that the global pattern of informal pattern is uneven, although there is tendency for regions with more developing countries to have a higher proportion of informal employment.</td></tr>
<tr><th>Level</th><th>Mark</th><th>Descriptor</th></tr>
<tr><td></td><td>0</td><td>No rewardable material.</td></tr>
<tr><td>Level 1</td><td>1–3</td><td>• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3)</td></tr>
</table>

		• Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	**7–8**	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Question number	Answer	Mark

1(a)(i)	**AO1 (1 mark)** C miner. (1) The answer cannot be A, B or D as these are all tertiary and quaternary sector jobs.	**(1)**

Question number	Answer	Mark
1(a)(ii)	**AO1 (1 mark)** Award one mark for a suitable factor. • Availability of workforce/labour (1). • Proximity to natural resources (1) • Availability of land for growing crops (1) . • Flat land/relief (1) Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
1(b)	**AO1 (1 mark)** D lack of unemployment benefits (1) It cannot be A, B or C as these are not characteristics of informal employment.	**(1)**

Question number	Answer	Mark
1(c)	**AO2 (1 mark) / AO3 (1 mark)** Award 1 mark for a basic evidence from the from the photograph (AO3) and a further 1 mark for extension through explanation (AO2), up to a maximum of 2 marks. • Open space (1) which means there is potential to expand at a later date. • Roads (1) to provide good access for the workforce (1). • Nice/pleasant environment (1) which is designed to act as a benefit for attracting a high quality workforce (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
1(d)	**AO1 (1 mark)** Award 1 mark for a suitable definition. • The difference between a country's demand for energy and its ability to produce that energy from its own resources (1). Accept responses that acknowledge the idea of difference between production and demand.	**(1)**

Question number	Answer	Mark
1(e)	**AO2 (4 marks)** Award 1 mark for each reason and a further expansion mark or exemplification, up to a maximum of 2 marks each. Maximum 2 marks where a developed country or no country is provided. A range of country examples could be chosen. • [China] Government investment in dams (1) to create more renewable energy through turbines (1) • [China] Multiple firms producing electric cars (1) so less fossil fuels used for transport (1). • [Morocco] Large investment from government into solar farms [1] to generate electricity from the sun that is readily available in the country. • [Morocco] Improving energy efficiency by updating technology (1) to update old solar farms with new technology (1). Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
1(f)	**AO1 (1 mark) / (AO3) 2 marks** Award 1 mark (AO1) for identification of a change and a further 2 marks (AO3) for extension through use of the resource, up to a maximum of 3 marks. • A rise in the use of wind power (1) to reduce carbon emissions (1) and reliance on fossil fuel energy (1). • A decline in the use of coal (1) to maintain a more sustainable energy mix (1) which is less reliant on fossil fuels (1). • Development of other renewable energy types such as biomass (1) as country seeks to support a more sustainable energy mix (1) with a more renewable energy (1). Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
1(g)	**AO2 (2+2 marks)** Award 1 mark for an advantage and a disadvantage, with a further expansion mark, up to a maximum of 2 marks each. • Advantage: ○ Renewable sources such as solar do not run out (1) so can help increase energy security (1). ○ Wind energy has a potentially infinite supply (1) so it can provide a complement to other energy sources (1). ○ Hydroelectric energy using the movement of water can provide an infinite supply of energy (1) but can also create water reserves (dams) (1). • Disadvantage: ○ Some renewable technologies can be expensive (1) so not always accessible to whole populations (1). ○ Some renewable resources are not reliable (1) for example where there is no wind, wind energy would not be efficient (1). ○ Some renewable energy resources such as tidal can only be located in certain places (1) so not always an option for national networks (1). Accept any other appropriate response.	**(4)**

Question number	Indicative content
1 (h)	**AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include: **AO3** • Developed based around the changes that took place in the UK the Clark-Fisher model provides an overview of employment changes that a country could typically go through as it moved from being a pre-industrial country to a post-industrial country. • There are three distinct phases in the model: ○ Pre-industrial phase where the primary sector dominates the economy and tends to account for over two thirds of employment. Agriculture tends to be the dominant activity. ○ Industrial phase where the secondary and tertiary sectors increase in productivity. The secondary sector tends to peak in this phase but does not tend to account for mor than two thirds of employment. ○ Post-industrial phase which involves a fall in primary and secondary sectors, a rise in tertiary sector employment and the emergence of the quaternary sector. • Reasons for the changes: ○ Mechanisation of agriculture reduces requirement for labourers which can then move to other sectors (with the potential for higher wages). ○ A rise in secondary sector businesses tends to dominate in cities, which can lead to increased rural-urban migration which not only fuels the secondary sector but the growth of the tertiary sector too. ○ Global shift of manufacturing in some developed countries can lead to a reduced secondary sector and the rise of tertiary and quaternary. ○ Advances in technology allows for reduced labour required in the secondary sector, but also the spread of service based employment in the tertiary and quaternary sectors. ○ **AO4** • Figure 1c shows the Clark-Fisher model which shows how employment structures typically change over time within a country. • On Figure 1c it can be seen that in pre-industrial countries there is a dominance of the primary sector. • On Figure 1c it can be seen that in industrial countries there is a rise initially in the secondary sector, followed by the tertiary sector.

	• Figure 1c shows how post-industrial countries have high tertiary sector employment, with rising quaternary sector employment and falling primary and secondary employment.	
Level	**Mark**	**Descriptor**
	0	No rewardable material.
Level 1	**1–3**	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	**7–8**	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Question number	**Answer**	**Mark**

1(a)(i)	**AO1 (1 mark)** D Access to road network. (1) The answer cannot be A, B or C as these are not factors which affect the location of primary industry.	**(1)**

Question number	Answer	Mark
1(a)(ii)	**AO1 (1 mark)** Award 1 mark for suitable example: • Research & development / universities (1). • Artificial intelligence (1). • 3D printing (1) • Computing / ICT (1) • Robotics (1). Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
1(b)	**AO1 (1 mark)** A ageing rural populations (1) It cannot be B, C or D as these are not impacts of a shift from primary secondary industries	**(1)**

Question number	Answer	Mark
1(c)	**AO2 (1 mark) / AO3 (1 mark)** Award 1 mark for basic evidence from the from the figure (AO3) and a further 1 mark for extension through explanation (AO2), up to a maximum of 2 marks. • Tertiary/services sector largest in USA (1) as industries have declined (1). • Peru has a mix of sectors with the largest being services (1) as they begun to move beyond industrialisation (1). • Large primary/agricultural sector in Zimbabwe (1) as economy relies largely on agricultural output (1). Different levels of primary sectors (1) due to different stages of industrialisation (1). Accept any other appropriate response	**(2)**

Question number	Answer	Mark
1(d)	**AO1 (1 mark)** Award 1 mark for a suitable response which related to features of the Clark-Fisher model on changing employment structure. • Change in employment/economic sector (1) • Change in employment over time (1) • Employment through industrialisation (1) Accept any other reasonable response.	**(1)**

Question number	Answer	Mark
1(e)	**AO2 (2+2 marks)** Award 1 mark for an advantage or disadvantage and a further expansion mark, up to a maximum of 2 marks each. Maximum 2 marks for an advantage or disadvantage. Range of named megacities could be chosen, for example: Delhi, Shanghai, Sao Paulo, Dhaka, Cairo, Beijing. Mexico City, Istanbul, Karachi. Advantages: • Allows people to access some form of employment (1) which can allow people to feed their families/maintain some quality of life (1). • Some employers pay well (1) because they are not paying taxes themselves (1). • Usually a closer relationship with the employer (1) which may make it easier to get time off if needed (1). Disadvantages: • Work is usually unregulated (1) which means they could be at more risk of accident or injuries (1). • Work is often low paid (1) and therefore they may not earn enough to support their families (1) • Little job security (1) as there is usually no contract (1). • Can sometimes involve child labour (1) which means they do not spend the time in education (1). Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
1(f)	**AO1 (1 mark) / (AO3) 2 marks** Award 1 mark (AO1) for basic point about difference in consumption, or specific data for individual country, and a further 2 marks (AO3) for extension through use of the resource, up to a maximum of 3 marks. • Higher demand in northern Europe (1) may be due to temperatures experienced (1) so energy demand may be higher to heat business and homes (1). • Demand may be higher in eastern European countries (1) as there may be more industrial processes taking place here (1) which are energy intensive (1). Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
1(g)	**AO2 (2+2 marks)** Award 1 mark for each environmental impact and a further expansion mark, up to a maximum of 2 marks each. • Using non-renewable energy source such as coal can increase carbon emissions (1) which can contribute to climate change (1). • Mining for non-renewable sources can lead to land degradation (1) which can damage habitats for local biodiversity (1). • Extraction of oil can lead to oil spills (1) which can kill local wildlife (1). • Burning fossil fuels can lead to air pollution (1) which can lead to environmental impacts such as acid rain (1). • Nuclear power plants can have leaks in earthquakes/tsunami (1) causing radiation poisoning to animals/fish in local environment (1). Accept any other appropriate response.	**(4)**

Question number	Indicative content
1 (h)	**AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include: **AO3** • Strategies to reduce an individual carbon footprint can be taken to address different activities in daily lives. • There are different types of strategies to make energy use more sustainable: • Some strategies to make energy use can involve energy conservation, reduction in energy use, or creation of green energy ○ Energy conservation and improving efficiency: through draft-proofing building to reduce heat losses through doors and windows. ○ Consumption choices in other areas of life such as food can have an impact on broader energy consumption. Choosing to buy food from local sources can reduce fuels and food miles. ○ Sustainable use of energy can also relate to the type of energy being used. Installing solar panels are an option for some households, although initial costs are relatively high so not necessarily accessible for everyone. • Some strategies have an immediate impact on sustainable energy use (i.e. reducing thermostat to save energy used in the household), compared to shopping second hand which saves energy in terms of the reduced need for new materials. **AO4** • Figure 1c shows strategies people can take to make their energy use more sustainable. • On Figure 1c it can be seen that some actions relate to the generation of renewable energy, which is more sustainable, such as solar power. • Figure 1c shows that some ways to use energy more sustainably relate to consumer choices for example choosing to buy local food (reducing transport fuels), shopping second hand (reducing production of new materials). • Figure 1c shows there are strategies that can be used to address different areas of energy consumption in peoples live (energy, transport and food).

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	**1–3**	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	**7–8**	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Question number	Answer	Mark

1(a)	**AO1 (1 mark)** C Tertiary (1) It cannot be A, B or D as these are not the sectors in which a school teacher would be employed.	**(1)**

Question number	Answer	Mark
1(b)(i)	**AO1 (1 mark)** B Lack of qualifications (1) The answer cannot be A, C or D as these are not causes of employment in the informal sector.	**(1)**

Question number	Answer	Mark
1(b)(ii)	**AO1 (1 mark)** Award 1 mark for a suitable job that can be found in the informal sector. • Street sellers/street food seller (1) • Shoe shining (1) • Rickshaw drivers (1) • Domestic workers (1) • Waste picker (1) • Textile worker/factory worker (1) • Construction workers (1). Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
1(c)	**AO2 (1 mark) / AO3 (1 mark)** Award 1 mark for basic evidence from the from the figure (AO3) and a further 1 mark for extension (AO2), up to a maximum of 2 marks. • They are farming (1) which involves the extraction of raw materials (1). • The workers are harvesting grain (1) which is the extraction of a raw material (1). • The workers are involved in heavy labour (1) which is typical of the primary sector (1). • The workers are using a tractor (1) which helps harvest the wheat/extract the raw material (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
1(d)	**AO1 (1 mark)** Award 1 mark for a suitable reason for the decline in the primary sector. • Mechanisation/increased used of machinery (1) • Industrialisation (1) • Rural to urban migration (1) • Shift to secondary sector industry (1) • Increased imports (1) • Poor wages (1) • Decline in soil fertility/low crop yields (1) • Climate change (1) Accept any other reasonable response.	**(1)**

Question number	Answer	Mark
1(e)	**AO2 (2+2 marks)** Award 1 mark for a positive impact and 1 mark for a negative impact and a further expansion mark, up to a maximum of 2 marks each. Maximum 2 marks for positive or negative impact. A range of developing or emerging countries could be chosen as context for this response. Do not double credit the same impact. Do not credit descriptions of increase or decrease in a sector as the impact. Positive: • Increased industrialisation meant the growth of more factories (1) which created more jobs/reduced unemployment. • Industrialisation led to greater investment in cities (1) which led to improvements in infrastructure (1). • Increased IT services meant some factories closed down (1) which improved air quality in the city (1). • Increased TNCs (1) provides more opportunities (1). Negative: • Increased industrialisation meant the growth of more factories (1) which reduced air quality in cities (1). • The growth of secondary sector industries led to more rural to urban migration (1) which left many rural areas with fewer workers (1). • Mechanisation in factories (1) can lead to reduced jobs available/ increased unemployment (1). • Increased TNCs (1) which may have poor working condition (1). Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
1(f)	**AO1 (1 mark) / (AO3) 2 marks** Award 1 mark (AO1) for basic point about level of investment shown, or specific data from the graph used, and a further 2 marks (AO3) for extension through use of the resource, up to a maximum of 3 marks. • Increased investment in buildings (1) from around $150 to $200bn (1) due to increase in use of renewable energy (1). • • High level of investment in buildings (1) due to growing populations /rapid urbanisation (1) and the need to reduce carbon emissions (1). • Overall increase in investment between 2015-2021 (1) as the importance of climate change mitigation is recognised (1) as this can reduce carbon emissions (1). • Consistently the highest investment in efficiency in buildings (1) may be due potential for retrofitting (1) so can be applied to all buildings in some form (1). Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
1(g)	**AO2 (2+2 marks)** Award 1 mark for one advantage and one disadvantage, and a further expansion mark, up to a maximum of 2 marks each. Advantage: • Reduce carbon emissions (1) which can contribute to climate change (1). • Energy production can be tailored to demand (1) as water is stored behind a dam (1). • Renewable energy source (1) therefore it won't out (1). • Tourism (1) which can support the local economy (1). Disadvantage • Requires construction of large dam (1) which means a large area behind it needs to be flooded/can require flooding of villages/habitats (1). • Construction of the dam can interrupt the natural flow of fish (1) which can affect livelihoods downstream (1).	**(4)**

	• Amount of energy produced is not as much as non-renewable energy (1) so need other sources of energy too (1). • Requires maintenance (1) which is expensive (1). Accept any other appropriate response.	

Question number	Indicative content	
1(h)	**AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include: **AO3** • The energy mix will be affected by the natural resources that are available in different regions of the world. • The energy mix will be affected by the environmental conditions that are more suitable for different types of renewable energy sources. • For example, areas with large river networks may be more suitable for development of hydro power, and those with more consistent sun conditions may be more suitable for solar power. • Levels of development can affect the demand for energy, and therefore potentially a greater demand for energy from a broader range of resources. • Access to nuclear power requires high levels of investment which means that it is not always a suitable option for all countries. • Investment in renewable energy technologies can be expensive and may not always be the most feasible options for all countries. **AO4** • Figure 1c shows how the EU and Africa have a large proportion of their energy from gas (40%/35%). • Figure 1c shows that while they broadly have the same types of energy production there are slight differences in how this is made up. • Figure 1c shows Africa makes significantly greater use of hydropower (17% compared to 7%). • Figure 1 shows the EU make significantly greater use of oil 15% for Africa compared to EU 31%). • Figure 1 shows how the EU make greater use of nuclear power (10% compared to 1% for Africa).	
Level	**Mark**	**Descriptor**
	0	No rewardable material.
Level 1	**1–3**	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that

		provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	**7–8**	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Question number	Answer	Mark

1(a)(i)	**AO1 (1 mark)** **D** lack of education. (1) The answer cannot be A, B or C as these are not causes of informal employment.	**(1)**

Question number	Answer	Mark
1(a)(ii)	**AO1 (1 mark)** Award 1 mark for a suitable advantage: • No taxes to pay (1) • Potential for flexibility in working hours (1) • Potential for income to support family (1) • Access to jobs with lack of formal education (1) • Less qualifications needed for jobs (1) • Access to cheaper goods and services (1) Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
1(b)	**AO1 (1 mark)** **D** quaternary (1) It cannot be A, B or C as these are not the correct sector for a research scientist to be located.	**(1)**

Question number	Answer	Mark
1(c)	**AO2 (1 mark) / AO3 (1 mark)** Award 1 mark for basic evidence from the from the figure (AO3) and a further 1 mark for extension through explanation (AO2), up to a maximum of 2 marks. • Cars are being produced (1) and secondary sector involves the production of manufactured goods (1). Car manufacturing (1) involves the conversion of raw materials to manufactured goods (1). Secondary sector involves manufacturing (1) and the figure shows cars being produced (1). • Machinery involved in production (1) showing manufacturing which is a core activity of the secondary sector (1). • Few workers present (1) as a lot of work in secondary sector is completed by machines (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
1(d)	**AO1 (1 mark)** Award 1 mark for a suitable reason. • Deindustrialisation (1) • Mechanisation/increase technology (1) • Population growth (1) • Change in demand for services (1). • Increased education (1). • Increase in disposable income (1) • Country development (1) • Urbanisation (1) • Investment by government/government policy (1) Accept any other reasonable response.	**(1)**

Question number	Answer	Mark
1(e)	**AO2 (2+2 marks)** Award 1 mark for a suitable positive and negative impact and a further expansion mark, up to a maximum of 2 marks each. Maximum 2 marks for the positive or negative impact. Range of developed countries may be used. Shift to tertiary or quaternary sector will usually be used as context. Positive: • Greater employment from tertiary jobs/services (1) whi ch leads to higher income (1) • Greater employment in quaternary sector (1) due to increased innovation/increased availability of technology (1) Negative: • Decrease in primary/secondary (1) means imported goo ds so loss of jobs (1) • Deindustrialsiation (1) unemployment/negative economi c multiplier/spiral of decline (1) Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
1(f)	**AO1 (1 mark) / (AO3) 2 marks** Award 1 mark (AO1) for reference to the level of investment shown in figure, and a further 2 marks (AO3) for extension with possible reference to the resource, up to a maximum of 3 marks. • Greater investment in renewable energy to increase energy security (1) and reduce reliance on fossil fuels (1) to reduce carbon emissions (1). • Increase in investment in electric vehicles to reduce use of petrol engine vehicles (1) to reduce carbon emissions (1) to mitigate against climate change (1). • Consistent levels of investment in low carbon fuels because they are expensive (1) and it is more cost efficient to invest in renewable power (1) which means more energy can be produced (1). • Increased in renewable energy resources (1) from around US$300 to 450 billion (1) due to countries trying to meet requires of international agreements on carbon emissions (e.g. Paris Agreement)(1). • Increased investment overall (1) due to increased development of countries (1) which requires more energy resources (1). Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
1(g)	**AO2 (2+2 marks)** Award 1 mark for an advantage and for a disadvantage of using solar panels and a further expansion mark, up to a maximum of 2 marks each. Advantage: • Relies on the power of the sun (1) which means areas of the world are suitable for power generation through solar panels (1). • Can be used to supply electricity off grid (1) which means more remote rural locations can be provided with electricity (1). • Renewable energy (1) will not run out like fossil fuels/ does not contribute to climate change/does not increase carbon emissions (1). Disadvantage • High installation costs (1) which may be prohibitive for places/people with lower incomes (1). • Only generate power during hours of sunlight (1) which means a battery needed to store energy (1). • In some countries are not as sunny (1)/which means they don't operate fully at all times (1). Accept any other appropriate response.	**(4)**

Question number	Indicative content
1 (h)	**AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include: **AO3** • The world continues to rely on fossil fuels for the production of energy. • Increased population growth is associated with increased demand for energy which in most countries cannot be met by renewable energy alone. • Industrialisation in developing and emerging economies has led to increased demand for energy. • Despite international pressures to reduce the use of fossil fuels, many countries still rely on fossil fuels for a large proportion of their

	energy, in part due to availability of resources, but also to ensure energy security. • The rate of fossil fuel use growth may be beginning to slow as the realisation of climate change and international agreements require governments to reduce carbon emissions and begin to reduce reliance on fossil fuels. **AO4** • Figure 1c shows increased production of energy from fossil fuels from 1981-2021. • Figure 1c shows that coal has increased from around 20,000TWh to over 40,000 Twh. • Figure 1c shows how the relative proportion of gas production has increased since 1981. • Figure 1c shows there have been periods short reductions in the use of fossil fuels in 2010 and 2020.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	**1–3**	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	**7–8**	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Question number	Answer	Mark

1(a)(i)	**AO1 (1 mark)** D wind (1) It cannot be A, B or C as these are not renewable energy sources.	**(1)**

Question number	Answer	Mark
1(a)(ii)	**AO1 (1 mark)** Award 1 mark for a suitable advantage: • reduced carbon emissions (1) • infinite supply of energy (1) • can support energy security (1) Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
1(b)	**AO1 (1 mark)** B groundwater pollution The answer cannot be A, C or D as these are not disadvantages of using shale gas as an energy source.	**(1)**

Question number	Answer	Mark
1(c)	**AO2 (1 mark) / AO3 (1 mark)** Award 1 mark for basic evidence from the from the figure (AO3) and a further 1 mark for extension through explanation (AO2), up to a maximum of 2 marks. • The factory could filter the emissions (1) to try and not create air pollution for the residential area (1). • Reduce carbon emissions (1) by switching to renewable energy (1). • To reduce air pollution (1) could use more efficient technology (1) Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
1(d)	**AO1 (1 mark)** Award 1 mark for a suitable factor. • Increased technology (1) • Industrialisation (1) • Urbanisation (1) • Increased living standards (1) • Increased population (1) Accept any other reasonable response.	**(1)**

Question number	Answer	Mark
1(e)	**AO2 (2+2)** Award 1 mark for a human factor and 1 mark for a physical factor and a further expansion mark, up to a maximum of 2 marks each. Maximum 2 marks for either factor. Human: • Labour supply (1) needed to farm the land/harvest crops (1). • Proximity to schools/universities (1) needed for training on different agricultural processes (1). • Transport connections/accessibility (1) to ensure fast routes to market for products (1). Physical: • Areas with flat land (1) are more suitable for growing crops (1). • Areas close to water supply (1) to support irrigation. • Availability of raw materials (1) such as coal deposits for mining (1). • Climate (1) as crops need different temperatures/levels of rainfall to grow (1). • Fertility of the soil (1) required to support growth of crops (1). Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
1(f)	**AO1 (1 mark) / (AO3) 2 marks** Award 1 mark for a point related to the distribution shown, and a further 2 marks for extension through use of the resource, up to a maximum of 3 marks. • Higher percentage in Central and Southern Africa (1) due to informal employment having a more prominent role in this region more generally (1) to provide household income (1). • There are high levels of informal employment for countries with low GDP (1) which could mean women have been unable to access sufficient education (1) so unable to access jobs in the informal sector (1). • There is no clear correlation between GDP and female informal employment (1) this could be due to informal employment being an important part of most economies globally (1) . • High percentage of informal work in Central and Southern Africa (1) as women are an important part of the workforce (1) as they need to provide for their families. Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
1(g)	**AO2 (2+2 marks)** Award 1 mark for each initial idea, and a further expansion mark, up to a maximum of 2 marks each. • Malthus was pessimistic about population and resources (1) he thought that increased food supply could only increase arithmetically (1). • Malthus suggested population growth is exponential (1) can lead to exponential growth if unchecked (1). • Malthus believed that population would exceed resources (1) until some sort of major event/point of crisis which would bring the population down (1). Can reach a point of crisis (1) due to population growing faster than resources (1). • Population growth faster than the increase in food supply (1) leading to not enough food to feed the population (1). Accept any other appropriate response.	**(4)**

Question number	Indicative content
1 (h)	**AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include: **AO3** • Typically the employment structure of an economy will change as it developed, according to the Clark-Fisher model. • The Clark-Fisher model suggests that: ○ Pre-industrial economies will have high primary sector activity. ○ Industrial economies will have rising secondary and tertiary sector activities. ○ Post-industrial economies will have a high proportion of tertiary sector, and rising quaternary sector industries. • It is suggested that as a country develops the countries move from one stage to another, although the speed at which they do so and particular mix will be specific to each county. • There are also factors around the types of raw materials, agricultural land available that can affect the level of primary industry. There are issues around energy/labour supply that can affect the development of secondary industry. Availability of education and training can also affect the development of the tertiary/quaternary sector industries. • Some countries may not necessarily develop in the pattern suggested by the Clark-Fisher model. For example, if a developing/emerging country economy has a government that heavily invests in the tourism industry rather than manufacturing then there would be a significant rise in tertiary sector rather than secondary. **AO4** • Figure 1c shows how the selected countries have different employment structures. • Figure 1c shows that developing countries such as Burundi can have a high primary sector, and low tertiary sector. • Figure 1c shows how developed countries like Canada can have low proportion of primary sector, relatively low secondary sector and high proportion of tertiary/quaternary sector employment. • Figure 1c shows that the range in sector employment does vary between developing/emerging economies with Liberia and Nigeria having significantly different structures to Burundi.

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	**1–3**	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	**7–8**	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Question number	Answer	Mark

1(a)(i)	**AO1 (1 mark)** **B** provision of services (1) It cannot be A, C or D as these are not features of the tertiary sector.	**(1)**

Question number	Answer	Mark
1(a)(ii)	**AO1 (1 mark)** Award 1 mark for a suitable factor. • Access to reliable electricity (1) • Proximity to labour force/customers (1). • Good transport links for workers (1). • Availability of land (1) Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
1(b)	**AO1 (1 mark)** **C** industrial (1) It cannot be A (from Malthus theory), B (global process) or D (process in city)	**(1)**

Question number	Answer	Mark
1(c)	**AO2 (1 mark) / AO3 (1 mark)** Award 1 mark for a reason (AO3) and a further 1 mark for extension through explanation (AO2), up to a maximum of 2 marks. • Increase in tertiary and quaternary sector employment (1) as economy shifts from raw materials to services (1). • An emerging economy driven by industrial growth (1) there is less focus on agriculture (1). • Decline in primary sector employment (1) as people leave rural areas in search of higher paid jobs/raw materials run out/globalisation allows for imports of raw materials (1). • Primary sector employment goes from 33.5-24.1/declines by 9.4 percentage points (1) as fewer workers required due to mechanisation (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
1(d)	**AO1 (1 mark)** Award 1 mark for a suitable non-renewable energy example. • Coal (1) • Oil (1) • (Natural) gas/LNG (1) • Nuclear (1)	**(1)**

Question number	Answer	Mark
1(e)	**AO2 (2+2 marks)** Award 1 mark for a suitable way identified and 1 mark for further expansion, up to a maximum of 2 marks each. • Move to electric vehicles (1) to reduce carbon emissions (1). • Develop more mass rapid transit/public transport (1) to reduce the number of vehicles emitting greenhouse gases (1). • Create more cycle lanes (1) to encourage greater use of bicycles (1). • Build more electric charging points (1) to encourage people to switch to electric vehicles (1). • Car sharing (1) to reduce costs in a household (1) Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
1(f)	**AO1 (1 mark) / (AO3) 2 marks** Award 1 mark (AO1) for basic evidence from the photograph, and a further 2 marks (AO3) for explanation of how the impact, up to a maximum of 3 marks. • Building wind turbines on rural land (1) may take up land that could be used for farmland (1) which may reduce rural incomes (1). • Building a wind farm near a village (1) may affect the visual impression of the landscape (1) as some people may not like the view (1). • Wind turbines in fields (1) may create more renewable energy (1) which increases energy resilience (1). • Increase in wind turbines (1) during construction could destroy fields and hedges (1) reducing biodiversity (1). • Could lead to deforestation (1) which could lead to increased CO_2 (1) and soil erosion (1). • Noise pollution (1) disturbing the peace for the people living in the village (1) people may want to leave the area (1) • Wind turbines increasing (1) creates changes to local microclimate (1) impacts habitats (1) • Building wind turbines on rural land (1) loss of land to build housing/ do agriculture on (1) because turbines take a lot of space (1) • Building wind turbines in the countryside (1) may mean birds are killed/struck by the blades (1) creating a loss in biodiversity (1) Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
1(g)	**AO2 (2+2 marks)** Award 1 mark for each factor, and a further expansion mark, up to a maximum of 2 marks each. A range of developing or emerging country contexts maybe chosen. Nigeria: • Increased demand for energy due to industrial growth (1) which requires more energy to run the machines (1). • Increased quality of life can lead to increased use of electrical consumer goods (1) which increases demand for energy (1). China: • Increase in population (1) leading to more need for electricity in households (1) • Rapid urbanisation (1) leading to growth in electricity demands to support cities (1). Accept any other appropriate response.	**(4)**

<table>
<tr><th>Question number</th><th colspan="2">Indicative content</th></tr>
<tr><td>1 (h)</td><td colspan="2">AO3 (4 marks)/AO4 (4 marks)
Marking instructions
Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below.

Indicative content guidance
The indicative content below is not prescriptive, and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include:

AO3
• In 1798 Thomas Malthus published ‘An Essay on the Principle of Population. This was a pessimistic view on the relationship between population and resources. It outlined how food supply could be increased with greater use of land but that it would only growth arithmetically while population growth would increase geometrically.
• Malthus predicted that over time population growth would outstrip resources creating a Malthusian catastrophe or point of crisis.
• In 1965 Ester Boserup published a more optimistic view on the relationship between population and resources. She argued that human innovation would allow humans to produce sufficient food.
• These innovations could be driven by finding new resources, the development of new technologies (such as those in the Green Revolution), advances in agricultural techniques, and more efficient production processes.

AO4
• Figure 1c shows how Malthus thought population would outstrip food resources over time.
• Figure 1c shows how Malthus had a pessimistic outlook predicting a catastrophe caused by population growth.
• Figure 1c shows how Ester Boserup thought that food supply would grow in stages to be higher than population growth.
• Figure 1c shows how Ester Boserup had a more optimistic outlook on population growth and that there would always be sufficient food supply.</td></tr>
<tr><th>Level</th><th>Mark</th><th>Descriptor</th></tr>
<tr><td></td><td>0</td><td>No rewardable material.</td></tr>
<tr><td>Level 1</td><td>1–3</td><td>• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3)
• Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)</td></tr>
</table>

Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	**7–8**	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Question number	Answer	Mark

1(a)(i)	**AO1 (1 mark)** A application of fertilisers (1) It cannot be B, C or D as these are not features of primary sector industries.	**(1)**

Question number	Answer	Mark
1(a)(ii)	**AO1 (1 mark)** Award 1 mark for a suitable factor. • Access to water (1) • Proximity to labour force/market (1). • Good transport links for workers/transporting products (1). • Availability of land (1) • Availability of raw materials/coal/iron ore (1) Accept any other reasonable response.	**(1)**

Question number	Answer	Mark
1(b)	**AO1 (1 mark)** C changes in employment structure (1) It cannot be A (cause of climate changer), B (economic value) or D (focus on transport not employment)	**(1)**

Question number	Answer	Mark
1(c)	**AO2 (1 mark) / AO3 (1 mark)** Award 1 mark for a change identified from the figure (AO3) and a further 1 mark for extension through explanation (AO2), up to a maximum of 2 marks. • Rise in tertiary & quaternary sector employment (1) as the economy moves to be service based rather than on products (1). • Loss in primary sector jobs (1) due to mechanisation (1). • Decrease in the secondary sector (1) due to global shift (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
1(d)	**AO1 (1 mark)** Award 1 mark for a suitable renewable energy example. • Solar (1) • Hydroelectric (1) • Wind power (1) • Wave (1) • Biomass (1) Accept any other reasonable response.	**(1)**

Question number	Answer	Mark
1(e)	**AO2 (2+2 marks)** Award 1 mark for a suitable way identified and 1 mark for further expansion, up to a maximum of 2 marks each. • Improve insulation (of roofs/walls) (1) to reduce heat loss /improve energy efficiency. (1) • Replace windows with double glazing (1) to reduce energy lost through windows (1) • Change from gas boiler to a heat pump (1) to reduce consumption of fossil fuels (1). • Reducing thermostat (1) to reduce energy consumption (1). • Installing solar panels (1) to reduce greenhouse gas emissions. Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
1(f)	**AO1 (1 mark) / (AO3) 2 marks** Award 1 mark (AO1) for basic evidence from the photograph, and a further 2 marks (AO3) for explanation of how the impact, up to a maximum of 3 marks. • Air pollution (1) due to emissions from burning coal leading to smoke (1) which could create respiratory health issues (1). • As a non-renewable energy resource (1) leads to increased carbon emissions (1) contributes to enhanced greenhouse effect (1). • Smoke from chimneys (1) causes health issues (1) such as Asthma (1). Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
1(g)	**AO2 (2+2 marks)** Award 1 mark for each suitable factor, and a further expansion mark, up to a maximum of 2 marks each. A range of developing or emerging country contexts may be chosen. • Availability of natural resources (1) which can affect the levels of energy production (1). • Energy infrastructure (1) which may not always be sufficient leading to loadshedding (1). • Increased demand from a growing population (1) leads to greater imports / production of energy (1). • Political instability/conflict (1) which can lead to disruption of energy production/can damage production facilities (1). Accept any other appropriate response.	**(4)**

Question number	Indicative content
1 (h)	**AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include: **AO3** • In 1798 Thomas Malthus published 'An Essay on the Principle of Population. This was a pessimistic view on the relationship between population and resources. It outlined how food supply could be increased with greater use of land but that it would only growth arithmetically while population growth would increase geometrically. • Malthus predicted that over time population growth would outstrip resources creating a Malthusian catastrophe or point of crisis. • In 1965 Ester Boserup publish a more optimistic view on the relationship between population and resources. She argued that human innovation would allow humans to produce sufficient food. • These innovations could be driven by finding new resources, the development of new technologies (such as those in the Green Revolution), advances in agricultural techniques, and more efficient production processes. **AO4** • Figure 1c shows how Malthus thought population would outstrip food resources over time. • Figure 1c shows how Malthus had a pessimistic outlook predicting a catastrophe caused by population growth.

	• Figure 1c shows how Esher Boserup thought that food supply would grow in stages to be higher than population growth. • Figure 1c shows how Ester Boserup had a more optimistic outlook on population growth and that there would always be sufficient food supply.	
Level	**Mark**	**Descriptor**
	0	No rewardable material.
Level 1	**1–3**	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	**7–8**	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Question number	Answer	Mark

4(a)(i)	**AO3 (1 mark)** Award 1 mark for any of the following. • Systematic (1) • Stratified (1) • Random (1) • Pragmatic (1) • Opportunistic (1) Accept any other appropriate response. **Note: Title not required for credit.**	**(1)**

Question number	Answer	Mark
4(a)(ii)	**AO3 (2 marks)** Award 1 mark for a reason further mark for extension through explanation, up to a maximum of 2 marks: • It allowed find out about the spatial variation in the area of study (1) so that we knew that we would get good spatial coverage to minimise bias (1). • Stratified sampling was used as we had census data about the towns population (1) so we could design a fair sampling frame for the questionnaire about energy that we were using (1). Accept any other appropriate response, e.g. asking “different people” is allowable.	**(2)**

Question number	Answer	Mark
4(b)	**AO3 (2 marks)** Award 1 mark for identifying a risk and a further expansion mark up to a maximum of 2 marks. Nature of risk, and risk management will vary depending on the location as well as the context of the investigation. • In the urban area there was lots of traffic so risk the was being struck by a vehicle (1). This was managed by only using a designed crossing (1). • Fieldwork was carried out in winter so there was a small risk of hypothermia (1). Lots of warm clothes were used (1). • The wet pavements in the town presented a slip and trip risk. (1). Non-slip shoes were used to minimise the risk of falling over (1). • I knew that the title focus had published secondary data (1) therefore it was achievable in terms of testing against someone else's findings – reducing risk (1). Accept any other appropriate response. **Note – credit ideas related to risk of poor-quality data collection.**	**(2)**

Question number	Answer	Mark
4(c)	**AO3 (3 marks)** Award 1 mark for each of the following identifiers: • Locations that can be identified e.g. places (1) • Site numbers along a street / locations of sampling etc (1). • Justifications and reasons, developed through explanation and clear geography (2). • Scale and direction arrows, titles, key etc (award a max of 1 mark total) (1). **Note: If work does not include annotations or descriptive labels, then max 2 marks.**	**(3)**

Question number	Answer	Mark
4(d)	**AO3 (4 marks)** Award 1 mark for limitation of a method and a further expansion mark, up to a maximum of 2 marks each. Nature of qualitative techniques utilised will vary depending on the location as well as the context of the investigation. • Interview data from a number of respondents were used to find out about attitudes towards energy use (1) but it was only a small sample (1) so we could not be convinced about the strength of the conclusions (1). • Digital photographs were taken of the fieldwork equipment to measure noise (1) so that this could be later used to help evaluate the methods and their reliability (1) but the photos did not include an effective scale (1). • Field notes recorded aspects of the site location and a description (1). The notes difficult to do since we did not know the history of the area (1) so I was unable to trust their validity (1). Accept any other appropriate response, allow questionnaires and EQA / Bi-polar (as opinion) as being qualitative data.	**(4)**

Question number	Indicative content
4(e)	**AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include: **AO3** • Both Figures 4a and 4b do show some outcomes from the fieldwork surveys, therefore it is possible to make some sense of what the student found. • Perhaps not all data has been presented.

	• Figure 4a seems incomplete as the nature of the questions asked is not present on the key so it's difficult to draw conclusions. • Figure 4b only shows one picture, so this might be biased as some could have been missed, therefore this technique is limited in its appropriateness. • Recognition of issue in presentation (both Figure 4a and b) may be flawed in terms of approach and usage. • An evaluation of how far the presentation techniques can be trusted may be provided. **AO4** • In Figure 4a there is no totals column for the Peoples Responses • In Figure 4a, some rows have incorrect addition • In Figure 4a the strongly agree category has been • In Figure 4a the colours may be the wrong choice of plot technique • In Figure 4b only 2 opinions are shown (there may have been more). • In Figure 4b the viewer doesn't know anything about the time the photo was taken, and therefore the frequency of lorry movements etc. • In Figure 4b don't anything about the area / context of where the image is take.

Level	Mark	Descriptor
	0	No acceptable response.
Level 1	1–3	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements are supported by limited evidence. (AO3) • Few aspects of the enquiry process are supported by the use of geographical skills to obtain information, which has limited relevance and accuracy. Communicates generic fieldwork findings and uses limited relevant geographical terminology. (AO4)
Level 2	4–6	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Some aspects of the enquiry process are supported by the use of geographical skills. Communicates fieldwork findings with some clarity, using relevant geographical terminology occasionally. (AO4)

Level 3	7–8	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • All aspects of the enquiry process are supported by the use of geographical skills. Communicates enquiry-specific fieldwork findings with clarity, and uses relevant geographical terminology consistently. (AO4)

Question number	Answer	Mark

4(a)(i)	**AO3 (1 mark)** Award 1 mark for any of the following. • Newspapers (1) • GIS map / paper map (1) • Book / magazine (1) • Government report / policy document (1) • Blog / forum / social media (1) Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
4(a)(ii)	**AO3 (2 marks)** Award 1 mark for a reason further mark for extension through explanation, up to a maximum of 2 marks: • It allowed find out about the spatial variation in the area of study (1) so that we knew that we would get good spatial coverage to minimise bias (1). • Stratified sampling was used as we had census data about the towns population (1) so we could design a fair sampling frame for the questionnaire about energy that we were using (1). Accept any other appropriate response. **Note: no credit for just restating the secondary data type.**	**(2)**

Question number	Answer	Mark
4(b)	**AO3 (2 marks)** Award 1 mark for identifying a reason and a further expansion mark up to a maximum of 2 marks. Nature of risk, and risk management will vary depending on the location as well as the context of the investigation.	

	• It was linked to an urban area close to school (1). Therefore, the data we collected would help answer the initial question set (1). • The model of coastal sand dune succession allowed us to test a theory (1), so the title and focus was established to challenge the assumptions in the model (1). • The title was both manageable and achievable. (1). Meaning that out primary data could be designed to fully answer the title set (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
4(c)	**AO4 (3 marks)** Award 1 mark for identification of a reason and a further mark(s) for an explanation of the reason, up to a maximum of 3 marks: The EQA scale only goes from -5 to + 5 and it is uncalibrated (1). This means that scores recorded by different people vary (1) which caused inaccuracies in the comparison between sites (1). A poor quality closed questions questionnaire used would have potential for errors to be introduced (1) for example by an inappropriate sequencing of questions (1) which would cause inaccurate findings to be recorded (1). Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
4(d)	**AO3 (4 marks)** Award 1 mark for a method and a further expansion mark, up to a maximum of 2 marks each. Nature of qualitative techniques utilised will vary depending on the location as well as the context of the investigation. • We used quantitative tools such as mean and median (1) so we could final measures of centrality in out data (1).	

	• Annotated sketches based on photographs from the fieldwork were used (1) and the selected annotations were able to highlight processes operating in the area (1). • A computer spreadsheet was used to calculate the spread and range in our questionnaire data (1) so that we could compare the outcomes between the two sample sites (1). Accept any other appropriate response. **Note: allow presentation in the context of analysis.**	**(4)**

Question number	Indicative content
4(e)	**AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include: **AO3** • Both Figures 4a and 4b do show some outcomes from the fieldwork surveys, therefore it is possible to make some sense of what the student found. • Figure 4a seems incomplete as the nature of the questions asked is not present on the key so it's difficult to draw conclusions. • Figure 4b only shows one picture, so this might be biased as some could have been missed, therefore this technique is limited in its appropriateness. • Recognition of issue in presentation (both Figure 4a and b) may be flawed in terms of approach and usage. • An evaluation of how far the presentation techniques can be trusted may be provided. **AO4** • In Figure 4a there is no totals column for the Peoples Responses • In Figure 4a the is no strongly agree category • In Figure 4a the colours may be the wrong choice of plot technique • In Figure 4b only 2 opinions are shown (there may have been more). They may have been edited. • In Figure 4b there is no idea as to how the responses were selected • In Figure 4b show anything about the area / context of where the interview took place and when.

Level	**Mark**	**Descriptor**
	0	No acceptable response.
Level 1	1–3	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements are supported by limited evidence. (AO3) • Few aspects of the enquiry process are supported by the use of geographical skills to obtain information, which has limited relevance and accuracy. Communicates generic fieldwork findings and uses limited relevant geographical terminology. (AO4)
Level 2	4–6	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Some aspects of the enquiry process are supported by the use of geographical skills. Communicates fieldwork findings with some clarity, using relevant geographical terminology occasionally. (AO4)
Level 3	7–8	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • All aspects of the enquiry process are supported by the use of geographical skills. Communicates enquiry-specific fieldwork findings with clarity, and uses relevant geographical terminology consistently. (AO4)

Question number	**Answer**	**Mark**

4(a) (i)	**AO3 (1 mark)** Award 1 mark for a suitable type of primary data. • Environmental quality survey (EQS, EQA) (1) • Questionnaire (1) • Interview (1) • Photographs (1) Nature of data will vary depending on the location as well as the context of the investigation. It must be relevant to a human geography focused piece of fieldwork.	**(1)**

Question number	Answer	Mark
4(a)(ii)	**AO3 (2 marks)** Award 1 mark for identifying a way it helped, and a further mark (s) for an explanation, up to a maximum of 2 marks: The primary data will vary on the nature and context of the fieldwork, but it must be plausibly linked to the focus: economic activity and energy. • Interviews were used to find out peoples' perceptions of the new wind farm (1) so that we knew more local attitudes of those who lived there (larger sample / survey) in order reach better conclusions (1). • Photographs were taken at the proposed HEP site to record the wildlife currently there (1) so we could understand more about how the area would change with the development (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
4(b)	**AO3 (2 marks)** Award 1 mark for identify a reason and a further mark for extension through explanation, up to a maximum of 2 marks. **NB:** the location provides a context for the investigation and the subsequent parts that follow – no credit for this. • It was safe to work in (1) and this means we could collect a sufficient range of data to be able to answer the hypothesis (1). • It was close to the local school (1) therefore we could collect primary data without having to spend a long time travelling (1) • The area provided two different communities / groups of people (1) therefore giving me a more complete picture of the contrasting attitudes towards energy development (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
4(c)	**AO3 (3 marks)** Award 1 mark for identification of the secondary data and its use, and a further mark (s) for an explanation, up to a maximum of 2 marks. The secondary data will vary on the nature and context of the fieldwork, but it must be plausibly linked to the focus: energy. • The local census information helped us to work out how many people lived in our sample area (1) so we were able to design a fair sample for the fieldwork (1) and that gave us stronger conclusions (1). • A local city energy future report from the regional government (accessed online) allowed us to find out about the proposed energy plans in the area (1) and we were then able to use these when we were considering the sample design (1) which allowed a more reliable data set to be collected (1). • A specialist textbook about energy allowed us to find out about the planning requirements for a large windfarm (1) and we then used GIS to simulate the type of area that would be good to build new energy source (1) and from that developed a series of questionnaires (1). Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
4(d)	**AO3 (2+2 marks)** Award 1 mark for a method and a further expansion mark, up to a maximum of 2 marks each. • We used located pie charts on a base map (1) to show the differences in outcomes based on the questionnaire survey (1). • We used gain loss-bar charts to show EQA data (1) and this made it easy to compare the best and worst sites (1). • We used scatter graphs to compare two proposed energy sites (1) which allowed us to see the relationship between places as revealed by the data (1). • Annotations on fieldwork pictures allowed commentary on different sites (1) allowing me to express my perceptions of differences (1). Accept any other appropriate response.	**(4)**

Question number	Indicative content
4(e)	**AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include: **AO3** • Both Figures 4a and 4b do show some outcomes from the fieldwork surveys, therefore it is possible to make some sense of what the student found. • Figure 4a seems to make it difficult to validate conclusions as don't know what data it is based upon • Figure 4b only shows two annotations, so this might be biased as some could have been missed, therefore this technique is limited in its appropriateness and value. • Line 6 cannot be verified in terms of reliability as there is not evidence noted as to how this statement has been made. • An evaluation of how far the conclusions can be trusted (line 10 +11) cannot be trusted as they are vague. **AO4** • In Figure 4a there are lots of generalisations. • In Figure 4a the is no data being presented as evidence. • In Figure 4a they are mostly lists of descriptive statements. • In Figure 4b only 2 simple labels are shown, rather than annotations as indicated in the title. • In Figure 4b the label blue sky is not very useful as a conclusion. • In Figure 4b the image includes no scale or direct reference to energy. • In Figure 4b there is no title provided by the student.

Level	Mark	Descriptor
	0	No acceptable response.
Level 1	1–3	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements are supported by limited evidence. (AO3) • Few aspects of the enquiry process are supported by the use of geographical skills to obtain information, which has limited relevance and accuracy. Communicates generic fieldwork findings and uses limited relevant geographical terminology. (AO4)
Level 2	4–6	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Some aspects of the enquiry process are supported by the use of geographical skills. Communicates fieldwork findings with some clarity, using relevant geographical terminology occasionally. (AO4)
Level 3	7–8	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • All aspects of the enquiry process are supported by the use of geographical skills. Communicates enquiry-specific fieldwork findings with clarity, and uses relevant geographical terminology consistently. (AO4)

Question number	Answer	Mark

4(a)	**AO3 (2 marks)** Award 1 mark for explaining the hazard / risk and a further mark for explaining how the risk is managed, up to a maximum of 2 marks. ***NB:*** *the title provides a context for the investigation and the subsequent parts that follow – no credit for this.* • In urban areas there is a lot of traffic so high risk of being struck by a vehicle (1) which was managed by only using a designed crossing (1). • Fieldwork was carried out in winter so there was a small risk of hypothermia (1) so lots of warm clothes were used (1). • The wet rocks present a slip and trip risk (1) so walking boots were used to minimise the risk of falling over (1). • Risk of collecting bias / unreliable data leading to invalid results (1) which could be managed by careful site selection / sample size / design (1). Nature of risk, and risk management will vary depending on the location as well as the context of the investigation.	**(2)**

Question number	Answer	Mark
4(b)(i)	**AO3 (2 marks)** Award 1 mark for identification of the qualitative data and its use, and a further mark (s) for an explanation, up to a maximum of 2 marks: The qualitative data will vary on the nature and context of the fieldwork, but it must be plausibly linked to the focus: economic activity and energy. • Interviews were unreliable since they often have bias (1) so the respondent may have a particular attitude towards the development which is not reflected in the wider population (1). • Photographs are a snapshot of what is happening at a certain time (1) so we don't know what the place / area looks like at other times, e.g. at night for example (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
4(b)(ii)	**AO3 (2 marks)** Award 1 mark for an improvement and a further mark for extension through explanation, up to a maximum of 2 marks: • We could have used a larger sample of people (1) and this would have made the conclusion's stronger based on more people's opinions (1). • Photographs could have been taken in different seasons (1) to see how the area has changed over time (1) • I could have completed more field sketches from different views (1) thereby giving me a more complete picture of the landscape and its environment (1).	**(2)**

	Accept any other appropriate response.	

Question number	Answer	Mark
4(c)	**AO3 (2 marks)** Award 1 mark for identification of the secondary data and its use, and a further mark (s) for an explanation, up to a maximum of 2 marks: The secondary data will vary on the nature and context of the fieldwork, but it must be plausibly linked to the focus: economic activity and energy. • The local census information helped us to work out how many people lived in our sample area (1) so we were able to design a fair sample for the fieldwork (1). • A 2018 city report from the regional government (accessed online) allowed to find out about the proposed plans in the area (1) and we were then able to use these when we were considering the sample design (1). • A specialist textbook about energy allowed us to find out about the planning requirements for a large windfarm (1) and we then used GIS to simulate the type of area that would be good to build new energy source (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
4(d)	**AO3 (2+2 marks)** Award **1** mark for a method and a further expansion mark, up to a maximum of **2** marks each. • We used located pie charts on a base map (1) to show the differences in outcomes based on the questionnaire survey (1). • We used gain loss-bar charts to show EQA data (1) and this made it easy to compare the best and worst sites (1). • We used scatter graphs to compare two proposed energy sites (1) which allowed us to see the relationship between places as revealed by the data (1). • Annotations on fieldwork pictures allowed commentary on different sites (1) allowing me to express my perceptions of differences (1). Accept any other appropriate response.	**(4)**

<table>
<tr><th>Question number</th><th colspan="2">Indicative content</th></tr>
<tr><td>4(e)</td><td colspan="2">AO3 (4 marks)/AO4 (4 marks)
Marking instructions
Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below.

Indicative content guidance
The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include:

AO3
• Both Figures 4a and 4b do show some relevant approaches to the collection questionnaire data.
• Figure 4a seems to have the questions in the wrong order
• Figure 4a – can be very difficult to judge age, therefore this technique is limited in its appropriateness.
• 4b has several limitations in terms of sample size, timing / frequency and the choice / selection of people.
• No justification or rationale for sample size or spacing, e.g. every 8th person – may lead to bias.
AO4
• In Figure 4a there are issues with the age categories – overlap.
• In Figure 4a the questions are poorly worded.
• In Figure 4a there is a scale which has a mid-3 on it.
• In Figure 4b there is a small sample size.
• In Figure 4b their questionnaires are delivered at lunchtime.</td></tr>
<tr><th>Level</th><th>Mark</th><th>Descriptor</th></tr>
<tr><td></td><td>0</td><td>No acceptable response.</td></tr>
<tr><td>Level 1</td><td>1–3</td><td>• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements are supported by limited evidence. (AO3)
• Few aspects of the enquiry process are supported by the use of geographical skills to obtain information, which has limited relevance and accuracy. Communicates generic</td></tr>
</table>

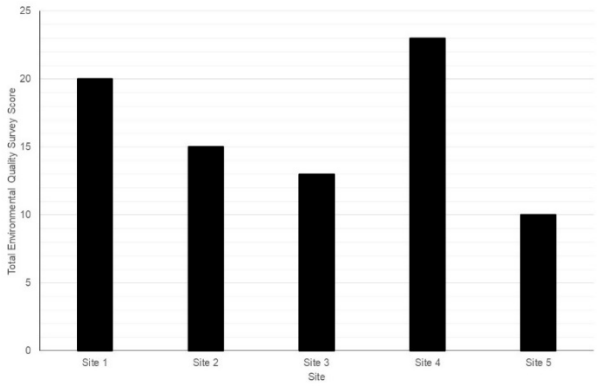
		fieldwork findings and uses limited relevant geographical terminology. (AO4)
Level 2	4–6	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Some aspects of the enquiry process are supported by the use of geographical skills. Communicates fieldwork findings with some clarity, using relevant geographical terminology occasionally. (AO4)
Level 3	7–8	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • All aspects of the enquiry process are supported by the use of geographical skills. Communicates enquiry-specific fieldwork findings with clarity, and uses relevant geographical terminology consistently. (AO4)

Question number	Answer	Mark

4(a)(i)	**AO3 (1 marks)** Award 1 mark for a suitable piece of secondary data. • Newspaper articles about the area. (1) • Local data on energy production and consumption. (1) • Census data. (1) • Leaflet from interested pressure group. (1) Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
4(a)(ii)	**AO3 (2 marks)** Award 1 mark for inital point and a further mark for explanation. • Can capture lots of detail (1) which means they can be examined properly after the fieldtrip has ended. (1) • Provides an accurate representation of the site (1) at that point in time (1).	

	• Can be used to capture the state of the site at the present time (1) which can be used to compare to historical photographs (1). • Easy to annotate to show details (1) so can help with analysis (1). Accept any other appropriate response. Do not accept: easy to take	**(2)**

Question number	Answer	Mark
4(b)(i)	**AO3 (2 marks)** 1 mark for each correctly plotted bar. Site 1 should be 20 (1) Site 2 should be 15 (1)  	**(2)**

Question number	Answer	Mark
4(b)(ii)	**AO4 (1 mark)** A – Bar (1) All the other options are incorrect.	**(1)**

Question number	Answer	Mark
4(b)(iii)	**AO3 (1 mark)**	

	• Site 4 (1)	**(1)**

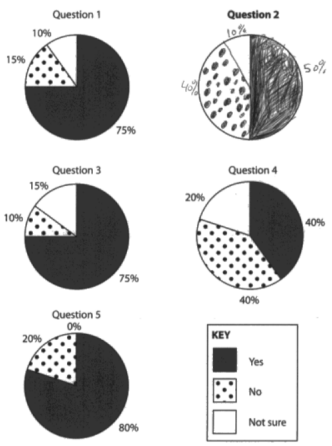
Question number	Answer	Mark
4(b)(iv)	**AO4 (2 marks)** Award 1 mark for the calculation of the correct answer = 13 (1) Award 1 mark for correct method to calculate range = 23-10 (1) or working out with similar numbers, i.e. understands idea of difference/substraction (highest and lowest values).	**(2)**

Question number	Answer	Mark
4(c)	**AO3 (3 marks)** Award 1 mark for a correct suggested way to manage a risk, with a further 2 marks for expansion. • Remain alert (1) to ensure awareness for traffic (1) to prevent accident. (1) • Wear appropriate clothing (1) to ensure remain comfortable during fieldwork (1) and reduce chance of illness. (1) • Work in groups (1) to ensure safety (1) against unexpected events. (1) Accept any other appropriate response. Note: credit ideas related to risk of poor data collection.	**(3)**

Question number	Answer	Mark

4(a)(i)	**AO3 (1 marks)** • Photos and sketches (1) • Information from newpapers/websites (1) Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
4(a)(ii)	**AO3 (2 marks)** • Systematic (1) collecting data in an ordered or regular way. (1) • Random/opportunistic (1) collecting evidence where possible/appropriate (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
4(b)(i)	**AO3 (1 mark)** 1 mark for each correctly drawing the lines and 1 mark for correctly shading or labelling the portions. Portions can be in any order. Yes: 50% No: 40% Not sure: 10% For example:  	**(2)**

Question number	Answer	Mark
4(b)(ii)	**AO4 (1 mark)** C Potential to generate a mixture of qualitiative and quantiative data.	**(1)**

Question number	Answer	Mark
4(b)(iii)	**AO3 (1 mark)** B The mean percentage for people who answered 'not sure' was 11.	**(1)**

Question number	Answer	Mark
4(b)(iv)	**AO4 (2 marks)** Award one mark for each suitable suggestion of how to improve data collection, up a maximum of 2 marks: • Increase the number of questionnaires completed (1) in order to get a more representative sample (1). • Increase the number of sites where data was collected (1) to get different perspectives (1). • Acquire more secondary data (1) to be able to understand more about the area before primary data collection (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
4(c)	**AO3 (3 marks)** Award 1 mark for identification of an advantage of secondary data, with a further 2 marks for expansion. • Secondary data can be compared to primary data (1) to check for any differences or similarities (1) and to confirm conclusions (1). • Increases sources of data (1) which can be used to form a more complete picture (1) which increases validity of the enquiry (1). • Can access different types of data that would otherwise be available (1) often with a much larger amount of data that could be collected by one student (1) expanding the types of data analysis that can be conducted (1). Accept any other appropriate response.	**(3)**

Question number	Answer	Mark

Question Number	Answer	Mark
4(a)	**AO3 (1 mark)** Award 1 mark for: 3 / Why? 4 / How do you think you could make your home more energy efficient? Accept either the question number on its own or it the candidate has written out the appropriate question shown above.	**(1)**

Question Number	Answer	Mark
4(b)	**AO3 (1 mark)** Award 1 mark for identifying a suitable advantage. • East to see proportion of results (1). • Easy to compare data (1) • Clear presentation of results (1). Accept any other appropriate response.	**(1)**

Question Number	Answer	Mark
4(c)	**AO3 (2 marks)** Award 1 mark for suitable sampling technique identified and further mark for explanation, up to a maximum of 2 marks. • Systematic sampling (1) collecting data in an ordered way e.g. every 5th person (1). • Stratified sampling (1) where a particular number of different categories of people are chosen to reflect the proportion of the number in the total population (1). • Random sampling (1) where there is no subjectivity over who is chosen to participate (1).	

	Accept any other appropriate response.	**(2)**

Question Number	Indicative content
4(d)	**AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include: **AO3** • Figure 4a shows an appropriate data collection method for exploring views about energy efficiency in the home. • Figure 4b presents simple data that was produced the questionnaire data, but doesn't explore the views in detail. • Figure 4a seems to make it difficult to validate conclusions because there is no way to classify the responses in more detail. • Figure 4b only shows presentation of data from two questions and doesn't show in combination with the outcomes of the different methods of the investigation. • Figure 4b does not present any of the qualitative data that could have revealed the information to help the student reach their aim. **AO4** • In Figure 4a there are no questions to categorise responses (gender, age etc). • In Figure 4a there are a range of open and closed questions to generate qualitative and quantitative data. • In Figure 4a there is no question to check understanding of how people understand energy efficiency. • In Figure 4b there are only 2 simple pieces of data presented. • In Figure 4b there are no data labels for some of the data presented. • In Figure 4b the pie charts are presented in different sizes.

Level	Mark	Descriptor
	0	No acceptable response.
Level 1	1–3	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements are supported by limited evidence. (AO3) • Few aspects of the enquiry process are supported by the use of geographical skills to obtain information, which has limited relevance and accuracy. Communicates generic fieldwork findings and uses limited relevant geographical terminology. (AO4)
Level 2	4–6	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Some aspects of the enquiry process are supported by the use of geographical skills. Communicates fieldwork findings with some clarity, using relevant geographical terminology occasionally. (AO4)
Level 3	7–8	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • All aspects of the enquiry process are supported by the use of geographical skills. Communicates enquiry-specific fieldwork findings with clarity, and uses relevant geographical terminology consistently. (AO4)

4(a)	**AO3 (1 mark)** Award 1 mark for: • Newspaper articles or photos in newspaper articles (1)	**(1)**

Question number	Answer	Mark
4(b)	**AO3 (1 mark)** Award 1 mark for identifying a suitable advantage. • Can include qualitative and quantitative data (1) • Can allow open and closed questions (1) • Easy to gather data (1) • Can be easily analysed (1) Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
4(c)	**AO3 (4 marks)** Award 1 mark for a suitable way reliability of data could have been affected and a further mark for extension through explanation, up to a maximum of 2 marks: • The student might have visited the area at a time when there were not many people around (1) so views collected would not be representative (1). • The student may have hurried the annotated diagram (1) so missed important details (1). • The environmental quality survey is subjective (1) so views may differ every time it is conducted (1). Accept any other appropriate response.	**(2)**

Question number	Indicative content
4(d)	**AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include: **AO3** • Both Figures 4a and 4b do show some outcomes from the fieldwork surveys, therefore it is possible to make some sense of what the student found. • Figure 4a seems to make it difficult to validate conclusions as not aware of the nature of the data collected to create the word cloud. • Figure 4b shows three basic conclusions, but it is difficult to use 4a to validate the conclusions as there is not enough detail about where these views were coming from. • Figure 4b the evaluation statements are quite vague and require more detail, although 4 makes a sensible suggestion about how to improve the study, particularly given conclusion 3. **AO4** • In Figure 4a there are lots of key words shown in the word cloud. • In Figure 4a the words are shown in different sizes which may indicate frequency. • Figure 4a does not provide context of who said these words. • Figure 4a does not suggest which questions these words respond to. • In Figure4b the conclusions are very descriptive. • In Figure 4b the evaluation statements make suggestions about how the methods could have been improved. • Figure 4b suggests there were elements of the fieldwork that were not effective.

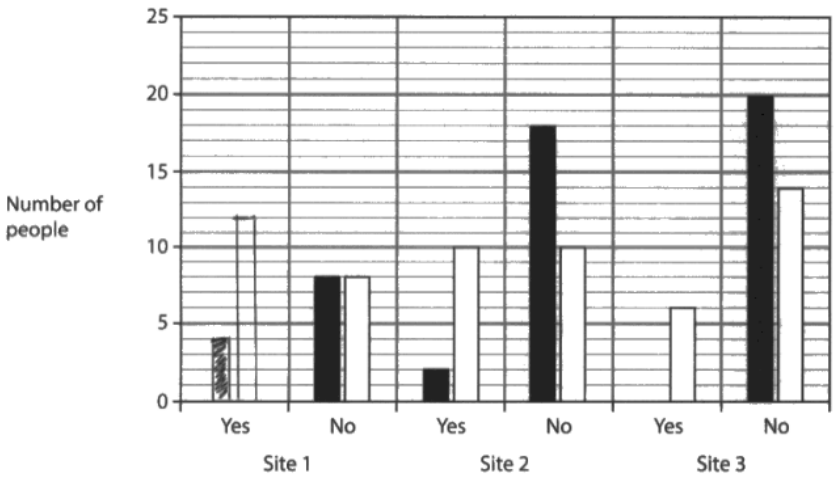
Level	Mark	Descriptor
	0	No acceptable response.
Level 1	1–3	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements are supported by limited evidence. (AO3) • Few aspects of the enquiry process are supported by the use of geographical skills to obtain information, which has limited relevance and accuracy. Communicates generic fieldwork findings and uses limited relevant geographical terminology. (AO4)
Level 2	4–6	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Some aspects of the enquiry process are supported by the use of geographical skills. Communicates fieldwork findings with some clarity, using relevant geographical terminology occasionally. (AO4)
Level 3	7–8	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • All aspects of the enquiry process are supported by the use of geographical skills. Communicates enquiry-specific fieldwork findings with clarity, and uses relevant geographical terminology consistently. (AO4)

Question number	Answer	Mark

4(a)(i)	**AO3 (1 mark)** Award one mark for any of the following: • Question 1 or "Does your house have any renewable technology?" • Question 3 or "Do you think having renewable energy technology saves you money". • Question 4 or "Do you own an electric car?" • Question 5 or "Would you like to own an electric car?" • Accept answers that just provide a number e.g. 1 or Q1.	**(1)**

Question number	Answer	Mark
4(a)(ii)	**AO3 (2 marks)** Award 1 mark for initial point, and a further mark for explanation, up to a maximum of 2 marks. • Open question allow opinions to be gained (1) which can be provided in more detail than closed questions (1). • Open questions allow for responses that were not expected (1) which would not be captured by closed questions (1). • Allows you gain qualitative data (1) which means you can understand people's views (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
4(b)(i)	**AO3 (1 mark)** Award 1 mark for: Systematic sampling (1) Allow systematic on its own.	**(1)**

Question number	Answer	Mark
4(b)(ii)	**AO4 (2 marks)** Award 1 mark each correctly drawn bar with correct shading. Award 2 marks for all 2 correctly drawn bars with correct shading. Some indication of shading is acceptable does not have to be completely filled in.  	**(2)**

Question number	Answer	Mark
4(b)(iii)	**AO4 (1 mark)** Award 1 mark for: Site 3 / 3 (1)	**(1)**

Question number	Answer	Mark
4(b)(iv)	**AO4 (2 marks)** Award 1 mark for working and 1 mark for correct answer. 12+ 10+ 6 = 28 / 3 (1) Allow 12+10+6/3 (1) = 9.3 (1) They do not have to write the answer on the answer line. Credit correct answers anywhere in the space provided.	**(2)**

Question number	Answer	Mark
4(c)	**AO3 (3 marks)** Award 1 mark for a suitable method, and further 2 marks for explanation. • Environmental Quality Survey (1) which could have assessed the varied quality of areas where there are more houses with renewable technologies (1) to see if there were any correlations (1). • Environmental Quality Survey (1) provides quantitative data (1) that can aid analysis/evaluation (1). • Interview a local city council representative (1) to understand what the city council was doing about renewable technologies (1) and if they were offering incentives to local people to use them in their homes (1). Accept any other appropriate response.	**(3)**

Question number	Indicative content
4(d)	**AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include: **AO3** • Evaluation is likely to be linked to the use of a range of data presentation methods to strengthen argument, linked to aims. • Evaluation will most likely be linked to the evaluation of the data presentation methods as well as collection methods and fieldwork design. • Recognition of the extent to which presentation methods chosen were suitable for the data types collected e.g. doesn't allow for presentation of qualitative data effectively. • A supported judgement is reached about the presentation methods, drawing on evidence such as strengths, weaknesses, alternatives and relevant examples using data. **AO4**

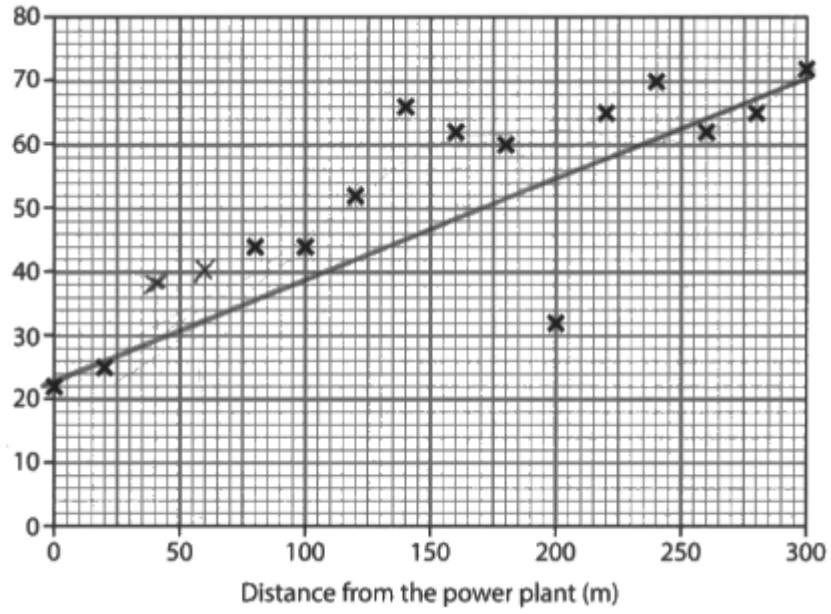
	• There is evidence of using different skills and techniques as part of primary fieldwork. • There is evidence of using different skills and techniques relevant to data presentation stage of the enquiry. • There is evidence of using different skills and techniques to investigate aspects of economic activity and energy. • There is evidence of own fieldwork data (and design) i.e. reference to the field data collected by the student.

Level	Mark	Descriptor
	0	No acceptable response.
Level 1	1–3	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements are supported by limited evidence. (AO3) • Few aspects of the enquiry process are supported by the use of geographical skills to obtain information, which has limited relevance and accuracy. Communicates generic fieldwork findings and uses limited relevant geographical terminology. (AO4)
Level 2	4–6	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Some aspects of the enquiry process are supported by the use of geographical skills. Communicates fieldwork findings with some clarity, using relevant geographical terminology occasionally. (AO4)
Level 3	7–8	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • All aspects of the enquiry process are supported by the use of geographical skills. Communicates enquiry-specific fieldwork findings with clarity and uses relevant geographical terminology consistently. (AO4)

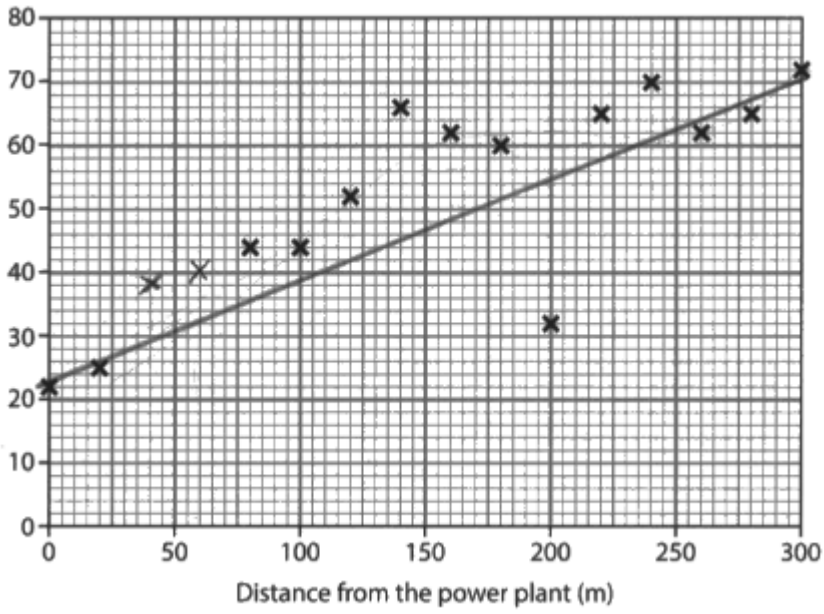
Question number	Answer	Mark

4(a)(i)	**AO3 (1 mark)** Award one mark for any of the following: • Question 2/Q2/2 or 'What benefits does it bring?' (1) • Question 6/Q6/6 or 'What impact do you think the new power plant has had on the area? (1) .	**(1)**

Question number	Answer	Mark
4(a)(ii)	**AO3 (2 marks)** Award 1 mark for initial point, and a further mark for explanation, up to a maximum of 2 marks. • Closed question allow opinions to be quantified (1) which make data analysis straightforward when creating graphs and charts (1). • Closed questions are usually quicker to respond to (1) so it might be possible to get more people to answer these (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
4(b)(i)	**AO4 (2 marks)** Award 1 mark for at each point plotted correctly at 40m and 60m. Correct diagram shown below:  	**(2)**

Question number	Answer	Mark
4(b)(ii)	**AO4 (1 marks)** Award 1 mark for: 200m (1) Accept 200.	**(2)**

Question number	Answer	Mark
4(b)(iii)	**AO4 (1 mark)** Award 1 mark for a suitable line drawn, similar to below:  Line of best fit needs to be within the first and last plots but angle and height can vary slightly from the example shown above.	**(1)**

Question number	Answer	Mark
4(b)(iv)	**AO4 (2 marks)** Award 1 mark for working and 1 mark for correct answer. • (52+60) /2 (1) • 56/56.0 (1)	**(2)**

Question number	Answer	Mark
4(c)	**AO3 (3 marks)** Award 1 mark for a suitable type of secondary, and further 2 marks for explanation. • Local newspaper articles (1) can be used to find out views of local people on the new power plant (1) and compare to those from a questionnaire (1). • Reports from local council on biodiversity and wildlife (1) to consider potential impacts on the local environment (1) and if anything is being done to reduce impact (1). Accept any other appropriate response. Do not credit 'internet' on its own.	**(3)**

Question number	Indicative content
4(d)	**AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include: **AO3** • Evaluation is likely to be linked to the use of a range of data collection methods to strengthen argument, linked to aims. • Evaluation will most likely be linked to the evaluation of the data collection methods as well as fieldwork design and the techniques used to analyse and present data. • Recognition of the extent to which data collection methods chosen were suitable for the data types collected e.g. doesn't allow for presentation of qualitative data effectively. • A supported judgement is reached about the data collection methods, drawing on evidence such as strengths, weaknesses, alternatives and relevant examples using data. **AO4** • There is evidence of using different data collection methods and thought about the design of these methods as part of primary fieldwork. • There is evidence of using different skills and techniques relevant to design of the methodology stage of the enquiry.

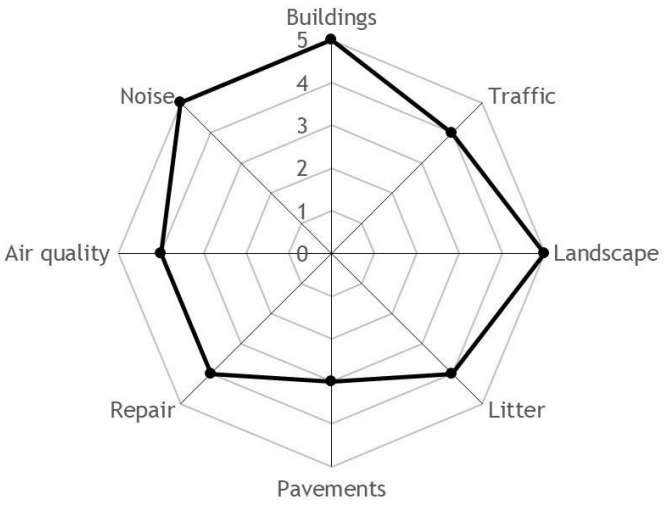
	• There is evidence of using different skills and techniques to investigate aspects of economic activity and energy. • There is evidence of own fieldwork data (and design) i.e. reference to the field data collected by the student.

Level	Mark	Descriptor
	0	No acceptable response.
Level 1	1–3	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements are supported by limited evidence. (AO3) • Few aspects of the enquiry process are supported by the use of geographical skills to obtain information, which has limited relevance and accuracy. Communicates generic fieldwork findings and uses limited relevant geographical terminology. (AO4)
Level 2	4–6	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Some aspects of the enquiry process are supported by the use of geographical skills. Communicates fieldwork findings with some clarity, using relevant geographical terminology occasionally. (AO4)
Level 3	7–8	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • All aspects of the enquiry process are supported by the use of geographical skills. Communicates enquiry-specific fieldwork findings with clarity and uses relevant geographical terminology consistently. (AO4)

Question number	Answer	Mark

4(a)(i)	**AO3 (1 mark)** Award one mark for a suitable type of secondary data. • Data on local population demographics (1). • Local planning reports (1). • Local newspaper articles (on energy issues) (1) • Data from social media (1). • Maps (1) • Data from previous fieldwork (1) Do not allow general data sources such as 'the internet' or 'textbooks'.	**(1)**

Question number	Answer	Mark
4(a)(ii)	**AO3 (2 marks)** Award 1 mark for initial point, and a further mark for explanation, up to a maximum of 2 marks. • It can be used to find out more features of the enquiry area (1) which can provide the context for the enquiry (1). • It can be used to confirm findings from primary data (1) and support conclusions (1). • It can be used to compare to historical patterns (1) to understand where changes have taken place (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
4(b)(i)	**AO4 (2 marks)** Award 1 mark for: Plotting points correctly (1) Connecting lines correctly (1). This should look like the diagram below:  	**(2)**

Question number	Answer	Mark
4(b)(ii)	**AO4 (1 mark)** Award 1 mark for a suitable observation. • The site has a good/positive environmental quality. (1) • The high scores suggest a high environmental quality. (1) • The area might not be set up for pedestrians. (1) • There is a lot of traffic in the area. (1)	**(1)**

Question number	Answer	Mark
4(b)(iii)	**AO4 (1 mark)** Award 1 mark for a suitable advantage: • A lot of different features can be plotted on one graph. (1) • It is clear to see the environmental quality of the area. (1) • Easy to compare different factors (1)	**(1)**

Question number	Answer	Mark
4(b)(iv)	**AO4 (2 marks)** Award 1 mark for working and 1 mark for correct answer. 5,4,5,4,3,4,4,5 or 3,4,4,4,4,5,5,5 (1) = 4 (1)	**(2)**

Question number	Answer	Mark
4(c)	**AO3 (3 marks)** Award 1 mark for an initial point, and further 2 marks for explanation. • Photographs can be used to record features of the area (1) which can be annotated in the data presentation stage (1) and demonstrate findings such as evidence of poor pavements (1). • Photographs can be used as an alternative for field sketches (1) and can be more accurate (1) to allow the student to look back after leaving the fieldwork site (1). • Photographs can be used for rephotography (1) so the current features could be compared with the past (1) to create an accurate understanding of changes (1).	**(3)**

Question number	Indicative content
4(d)	**AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include: **AO3** • Evaluation is likely to be linked to the conclusions made and how these linked to the aims for the enquiry. • Evaluation will most likely be linked to the methods used that led to these conclusions and how the nature of fieldwork design led to the creation of the conclusions. • Recognition of the extent to which aim was met and how the methods chosen to allow these conclusions to be reached. • A supported judgement should be reached about how the aim was met drawing on evidence from the conclusions, such as the strength and weaknesses of the findings, using relevant examples from either the data or the conclusions that they led to. **AO4** • There is evidence of using different skills and techniques as part of primary fieldwork. • There is evidence of using different skills and techniques relevant to the conclusion stage of the enquiry. • There is evidence of using different skills and techniques to investigate aspects of economic activity and energy. • There is evidence of own fieldwork data (and design) i.e. reference to the field data collected by the student.

Level	Mark	Descriptor
	0	No acceptable response.
Level 1	1–3	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements are supported by limited evidence. (AO3) • Few aspects of the enquiry process are supported by the use of geographical skills to obtain information, which has limited relevance and accuracy. Communicates generic fieldwork findings and uses limited relevant geographical terminology. (AO4)
Level 2	4–6	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Some aspects of the enquiry process are supported by the use of geographical skills. Communicates fieldwork findings with some clarity, using relevant geographical terminology occasionally. (AO4)
Level 3	7–8	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) All aspects of the enquiry process are supported by the use of geographical skills. Communicates enquire-specific fieldwork findings with clarity and uses relevant geographical terminology consistently. (AO4)

Question number	Answer	Mark

4(a)(i)	**AO3 (1 mark)** Award one mark for a suitable risk: • Getting lost (1) • Falls/slips/injuries (1) • Loss of equipment (1) • Being hit by traffic/bikes (1) • Theft (1) • Sunburn/hypothermia (1) • Data collected is biased/data not reliable (1) • Failure of equipment (1) • Difficulty in achieving sample size (1) • Issues with wildlife (1) Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
4(a)(ii)	**AO3 (2 marks)** Award 1 mark for suitable factor, and a further mark for explanation, up to a maximum of 2 marks. • Accessibility (1) they needed to be in walking distance to ensure data could be collected (1). • To ensure range of data gathered across the village (1) to support reliable conclusions (1). • Time available (1) to ensure all sites could be feasibly visited in a day (1). • Safety (1) to not go in areas that do not have sufficient pavements (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
4(b)	**AO3 (2 marks)** Award 1 mark for a suitable way identified, and a further mark for development or explanation. • Local newspaper articles (1) to provide evidence to support conclusion (1). • Government reports (1) provided background data on new renewable energy targets (1). • Government website (1) with data on local population characteristics (1). • Old photographs (1) to show change over time (1).	**(2)**

	• Past investigations (1) to check for annual changes (1). • Maps/online maps/land use maps (1) to be able to explore patterns (1). Accept any other appropriate response. Secondary data needs to be specific, do not accept, the internet for information. The secondary data will vary depending on the nature and context of the fieldwork, but it must be plausibly linked to the focus: economic activity and energy.	

Question number	Answer	Mark
4(c)	**AO3 (4 marks)** Award 1 mark for an advantage and 1 mark for a disadvantage with a further mark for development or explanation up to a maximum of 2 marks each. Max 2 marks for advantage or disadvantages. The data presentation techniques will vary depending on the nature and context of the fieldwork, but it must be plausibly linked to the focus: economic activity and energy. Advantages • Pie chart allows view of relative proportion of people's views (1) which allows conclusions to be formed (1). • Bar graph give a clear visual picture of the data (1) which provides a summary of questionnaire data to be able to form conclusions (1). Disadvantages: • Pie chart only showed overall proportions of people's views (1) rather than explaining what they thought. • Bar graph only shows a snapshot of information (1) rather than how the data has changed over time (1). Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
4(d)	**AO3 (3 marks)** Award 1 mark for an initial point, and further 2 marks for explanation. • Data was collected at several sites (1) to ensure an accurate representation of views (1) to ensure conclusions could be supported with evidence (1). • Findings from primary data collection were compared to findings from secondary data collection (1) and similar ideas were found (1) showing how the conclusions confirmed the views about the new development (1). Accept any other appropriate response.	**(3)**

<table>
<tr><th>Question number</th><th colspan="2">Indicative content</th></tr>
<tr><td>4(e)</td><td colspan="2">AO3 (4 marks)/AO4 (4 marks)
Marking instructions
Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below.

Indicative content guidance
The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include:

AO3
• Evaluation is likely to be linked to the choice of equipment and data collection methods used and how these linked to the aims for the enquiry.
• Evaluation will most likely be linked to how suitable the equipment was for the choice of data collection methods and how this may have affected the conclusions made.
• Recognition of the extent to which aim was met and how the equipment and data collection methods were suitable for the type of fieldwork carried out.
• A supported judgement should be reached about the choice of equipment and data collection methods, such as the strength and weaknesses, or suggestions of additional/alternative equipment or data collection methods which could have been used.

AO4
• In Figure 4a there shows there is relevant fieldwork equipment for the data collection methods identified (e.g. Interview guide for interviews).
• In Figure 4a shows the students are using both primary and secondary data.
• In Figure 4a does not specify if they are using any maps.
• In Figure 4b there are no age groups specified in the interview.
• In Figure 4b some of the questions are too general, e.g. Q3.
• In Figure 4b the student only collects quantitative data for Q6 which should have been followed with a question to understand the reasons for their respond in Q6.</td></tr>
<tr><th>Level</th><th>Mark</th><th>Descriptor</th></tr>
<tr><td></td><td>0</td><td>No acceptable response.</td></tr>
<tr><td>Level 1</td><td>1–3</td><td>• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements are supported by limited evidence. (AO3)
• Few aspects of the enquiry process are supported by the use of geographical skills to obtain information, which has</td></tr>
</table>

		limited relevance and accuracy. Communicates generic fieldwork findings and uses limited relevant geographical terminology. (AO4)
Level 2	4–6	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Some aspects of the enquiry process are supported by the use of geographical skills. Communicates fieldwork findings with some clarity, using relevant geographical terminology occasionally. (AO4)
Level 3	7–8	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • All aspects of the enquiry process are supported by the use of geographical skills. Communicates enquiry-specific fieldwork findings with clarity and uses relevant geographical terminology consistently. (AO4)

Question number	Answer	Mark

4(a)	**AO3 (1 mark)** Award one mark for a suitable type of sampling. • Random (1) • Stratified (1) • Systematic (1) • Opportunistic (1) Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
4(b)	**AO4 (2 marks)** Award 1 mark for initial point, and a further mark for explanation, up to a maximum of 2 marks. The risks managed will vary depending on the nature and context of the fieldwork, but it must be plausibly linked to the focus: economic activity and energy. • We crossed the road safely (1) to avoid getting hit by cars/bikes/buses (1). • Conducted a risk assessment before travelling to fieldwork site (1) to ensure we were aware of risks we could face (1). • Provided team members with phone numbers (1) so we could regroup if we got lost (1). • Wore suncream/lots of layers (1) to avoid sunburn/avoid hypothermia (1). • We stayed in our group/took a map/took our phone (1) to avoid getting lost (1). • Carried water supplies (1) to avoid dehydration (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
4(c)(i)	**AO3 (2 marks)** Award 1 mark for initial point, and a further mark for explanation, up to a maximum of 2 marks. The equipment used will vary depending on the nature and context of the fieldwork, but it must be plausibly linked to the focus: economic activity and energy. • Mobile phone (1) to plot data on a map/take photos (1). • Questionnaire (1) to gather views from local people (1). • Sound meter (1) to explore changes in noise around the area (1). • Stopwatch (1) for timing a minute to count pedestrians (1). • Pencil (1) to draw annotated field sketches/diagrams (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
4(c)(ii)	**AO3 (4 marks)** Award 1 mark for each advantage and disadvantage, and a further mark for explanation, up to a maximum of 2 marks for each. The data collection methods used will vary depending on the nature and context of the fieldwork, but it must be plausibly linked to the focus: economic activity and energy. Advantages: • Survey was a quick way of collecting data (1) which meant we could collect a bigger sample (1). • Taking photographs provided an accurate visual record of the area (1) which meant I could refer back to them when doing the data analysis (1). • Environmental quality surveys create quantitative data (1) which makes easy to compare (1). Disadvantages: • People didn't want to fill in our surveys (1) which meant we had a small sample (1). • Photographs do not capture the sounds and smells of the sites (1) so cannot be used to recollect all details about the environmental quality of the area (1). • Environmental quality surveys are subjective (1) so different people may get different data about the same site (1). Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
4(d)	**AO3 (3 marks)** Award 1 mark for an initial point, and further 2 marks for explanation. • I took photographs as well as field sketches (1) to make sure I did not miss any details (1) this meant I could refer to these images when analysing the data (1). • I chose several sites around the area (1) to make sure that I collected data from a range of people (1) to try and get a representative sample of people (1). Accept any other appropriate response.	**(3)**

Question number	Indicative content
4(e)	**AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include: **AO3** • Evaluation is likely to be linked to the data presentation methods used and how these linked to the aims for the enquiry. • Evaluation will most likely be linked to how effective the data presentation methods are for displaying the chosen data, and the level of detail provided in these data presentation methods. • Recognition of the extent to which aim could be met with the chosen data presentation methods. • A supported judgement should be reached about the suitability and quality of the data presentation methods, such as the strength and weaknesses of these methods, using relevant examples from the figures provided. **AO4** • Figure 4a shows a bar graph of total environmental quality scores, but does not show what elements were used to create this total score. • Figure 4a is accurately labelled axis and has a title. • Figure 4b is a pie chart where it is easy to see the proportions of how people responded. • Figure 4b does not have any percentage labels so it is difficult to know the exact percentages.

	• Figure 4b shows there are overlaps on the categories of distances recorded.	
Level	**Mark**	**Descriptor**
	0	No acceptable response.
Level 1	1–3	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements are supported by limited evidence. (AO3) • Few aspects of the enquiry process are supported by the use of geographical skills to obtain information, which has limited relevance and accuracy. Communicates generic fieldwork findings and uses limited relevant geographical terminology. (AO4)
Level 2	4–6	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Some aspects of the enquiry process are supported by the use of geographical skills. Communicates fieldwork findings with some clarity, using relevant geographical terminology occasionally. (AO4)
Level 3	7–8	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • All aspects of the enquiry process are supported by the use of geographical skills. Communicates enquiry-specific fieldwork findings with clarity and uses relevant geographical terminology consistently. (AO4)

Question number	**Answer**	**Mark**

4(a)(i)	**AO3 (1 mark)** Award one mark for a suitable type of graph: This will be dependent on the type of enquiry but typically graphs could include: • Bar graph/stacked bar graph (1) • Line graph (1) • Pie chart (1) • Histogram • Scattergraph (1) • Bubble chart (1) • Box plot (1) Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
4(a)(ii)	**AO3 (2 marks)** Award 1 mark for initial reason, and a further mark for explanation, up to a maximum of 2 marks. This will be dependent on the previous response but answers could include: • Easy to visualise the data (1) and make comparisons between locations/data sets (1). • Can be used to identify patterns (1) and show any significant anomalies in the data (1). • Suitable for the data being plotted (1) needed to show change over time/continuous data (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
4(b)	**AO3 (2 marks)** Award 1 mark for a suitable qualitative technique, and a further mark for development or explanation. This will vary depending on enquiry question, but could include: • Photographs (1) to capture accurate visual record of the surrounding to annotate later (1). • Interviews (1) to capture views of local stakeholders (1) • Surveys/questionnaires (with open questions) (1) to understand the reasons behind participant choices (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
4(c)	**AO3 (4 marks)** Award 1 mark for each type of secondary data identified with a further mark for development or explanation up to a maximum of 2 marks each. Max 2 marks for each way provided. The type of secondary data will vary on the nature and context of the fieldwork, but it must be plausibly linked to the focus: economic activity and energy. • Used local newspaper articles (1) to research information about the history of the local area (1). • Used a government report (about recycling) (1) to provide a national context for changes taking place to inform my interview questions (1). • Used data on property prices (1) to look for correlations with the data I had from the Environmental Quality Survey (1). • Photographs (1) to understand features of the area over time (1). • Map (1) to be able to examine land features (1). Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
4(d)	**AO3 (3 marks)** Award 1 mark for identification of an improvement, and further 2 marks for explanation. The type of data analysis will vary on the nature and context of the fieldwork, but it must be plausibly linked to the focus: economic activity and energy. • I could have compared the data I had from different sites (1) in order to consider broader patterns (1) to understand where significant differences were (1). • I could have created a word cloud with data from the report (1) to systematically highlight key themes from the report (1) rather than just highlight interesting sentences (1). • I could have used a pie charts/bar charts (1) to show the breakdown of categories (1) to allow easier comparison of data/to identify trends (1). • Use a greater variety of data presentation methods/use line graphs rather than pie chart (1) to be able to more easily identify trends (1) to be able to support conclusions (1). Accept any other appropriate response.	**(3)**

<table>
<tr><th>Question number</th><th colspan="2">Indicative content</th></tr>
<tr><td>4(e)</td><td colspan="2">AO3 (4 marks)/AO4 (4 marks)
Marking instructions
Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below.

Indicative content guidance
The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include:

AO3
• Evaluation is likely to be linked to the conclusions made and how these linked to the aims for the enquiry.
• Evaluation will most likely be linked to the methods, and limited data presentation provided that led to these conclusions and how the nature of fieldwork design led to the creation of the conclusions.
• Recognition of the extent to which aim was met and how the methods chosen to allow these conclusions to be reached.
• A supported judgement should be reached about how useful the conclusions were, using relevant examples from the resources.
AO4
• In Figure 4a there is a summary of data collection methods used (including photographs and questionnaire collected along a transect, and secondary data).
• In Figure 4a shows the students are using both primary and secondary data.
• In Figure 4b there is a bubble graph which shows evidence of buildings with solar panels along the transect.
• In Figure 4c there are conclusions about the use of solar panels and renewable energy more generally.</td></tr>
<tr><th>Level</th><th>Mark</th><th>Descriptor</th></tr>
<tr><td></td><td>0</td><td>No acceptable response.</td></tr>
<tr><td>Level 1</td><td>1–3</td><td>• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements are supported by limited evidence. (AO3)
• Few aspects of the enquiry process are supported by the use of geographical skills to obtain information, which has limited relevance and accuracy. Communicates generic fieldwork findings and uses limited relevant geographical terminology. (AO4)</td></tr>
<tr><td>Level 2</td><td>4–6</td><td>• Applies understanding to deconstruct information and provide some logical connections between concepts. An</td></tr>
</table>

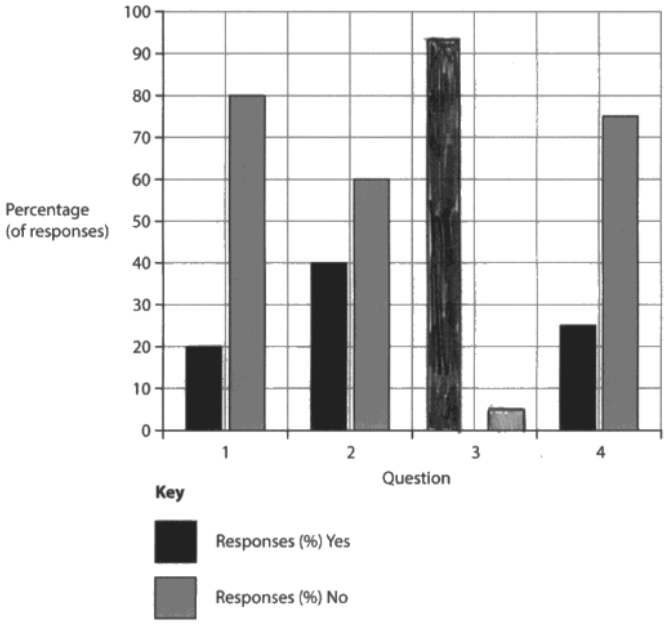
		imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Some aspects of the enquiry process are supported by the use of geographical skills. Communicates fieldwork findings with some clarity, using relevant geographical terminology occasionally. (AO4)
Level 3	7–8	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • All aspects of the enquiry process are supported by the use of geographical skills. Communicates enquiry-specific fieldwork findings with clarity and uses relevant geographical terminology consistently. (AO4)

Question number	Answer	Mark

4(a)	**AO3 (1 mark)** Award one mark for a suitable piece of equipment: • Camera/Mobile phone (1) • Environmental quality survey sheet (1) • Questionnaire (1) • Map (1) • Stopwatch (1) • Notebook (1) Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
4(b)	**AO3 (1 mark)** Award 1 mark for either of the following: • Websites/leaflets (on local solar power schemes). (1) • Data on the number of solar panels (in Paris). (1)	**(1)**

Question number	Answer	Mark
4(c)	**AO3 (3 marks)** Award 1 mark for a suitable reason, and a further mark for development or explanation up to a maximum of 3 marks. • It is less biased than other options (1) as participants are chosen randomly rather than for a particular reason (1) which means data should be more accurate (1). • Random sampling is easy to implement (1) it does not require access to a particular group of people (1) so they can be selected as they walk by (1). Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
4(d)(i)	**AO4 (2 marks)** Award 1 mark for accurate plotting of each bar.  	**(2)**

Question number	Answer	Mark
4(d)(ii)	**AO3 (1 mark)** Award 1 mark for another suitable presentation method: • Pie chart (1) Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
4(d)(iii)	**AO4 (2 marks)** Award 1 mark for correct method to calculate the range. Award 2 marks for correct answer. NB Only look at working out if answer is incorrect. 50-20 (1) (method mark) 30 (2)	**(2)**

Question number	Answer	Mark
4(e)	**AO3 (2 marks)** Award 1 mark for an advantage, and 1 mark for a disadvantage. • Advantage: ○ Easy to see patterns for each site (1) ○ Easy to compare sites (1) • Disadvantage: ○ Does not show any correlations between questions (1) ○ This chart shows percentages rather than real numbers of responses (1). ○ Difficult to read accurately because of the scale on the y-axis being so spaced out (1) ○ Difficult to know what question was asking from the graph (1) Accept any other appropriate response.	**(2)**

<table>
<tr><th>Question number</th><th colspan="2">Indicative content</th></tr>
<tr><td>4(f)</td><td colspan="2">AO3 (4 marks)/AO4 (4 marks)
Marking instructions
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Indicative content guidance
The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include:

AO3
• Evaluation is likely to be linked to the use of a range of data collection methods to generate qualitative data.
• Evaluation will most likely make links between the qualitative data used and how this strengthened the argument/conclusions.
• Evaluation will most likely be linked to the evaluation of the use of quantitative data alongside qualitative data to form accurate conclusion.
• Recognition of the extent to which the type of data collected can affect how data is analysed/ the aim is met/conclusions are made.
• A supported judgement is reached about the use of qualitative data in their enquiry drawing on evidence such as strengths, weaknesses, alternatives and relevant examples using data.

AO4
• There is evidence of using different skills and techniques as part of primary fieldwork.
• There is evidence of qualitative techniques such as interviews, open ended questions in questionnaires, photographs.
• There is evidence of using different skills and techniques relevant to how data is collected or analysed as part of the enquiry.
• There is evidence of using different skills and techniques to investigate aspects of economic activity and energy.
• There is evidence of own fieldwork data i.e. reference to the field data collected by the student.</td></tr>
<tr><th>Level</th><th>Mark</th><th>Descriptor</th></tr>
<tr><td></td><td>0</td><td>No acceptable response.</td></tr>
<tr><td>Level 1</td><td>1–3</td><td>• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements are supported by limited evidence. (AO3)
• Few aspects of the enquiry process are supported by the use of geographical skills to obtain information, which has limited relevance and accuracy. Communicates generic fieldwork findings and uses limited relevant geographical terminology. (AO4)</td></tr>
</table>

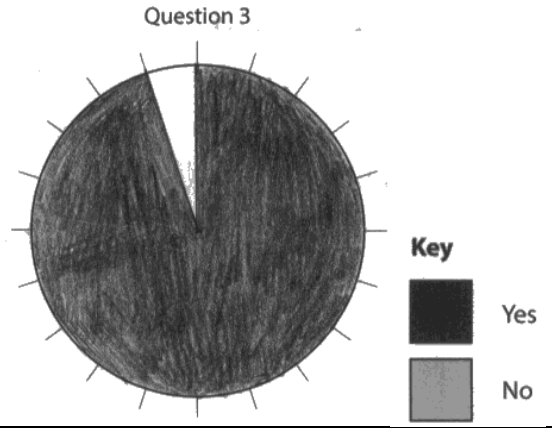
Question number	Answer	Mark
Level 2	4–6	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Some aspects of the enquiry process are supported by the use of geographical skills. Communicates fieldwork findings with some clarity, using relevant geographical terminology occasionally. (AO4)
Level 3	7–8	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • All aspects of the enquiry process are supported by the use of geographical skills. Communicates enquiry-specific fieldwork findings with clarity and uses relevant geographical terminology consistently. (AO4)

Question number	Answer	Mark

4(a)	**AO3 (1 mark)** Award one mark for a suitable risk: • Road safety (1) • Weather conditions (1) • Proximity to electricity pylon (1). • Access rights (1) Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
4(b)	**AO3 (1 mark)** Award 1 mark for any of the following: • Environmental quality survey (1) • Questionnaires (1) • Photographs (1)	**(1)**

Question number	Answer	Mark
4(c)	**AO3 (3 marks)** Award 1 mark for a suitable reason, and a further mark for development or explanation up to a maximum of 3 marks. • Systematic sampling is easy to implement (1) it does not require access to a particular group of people (1) so they can be selected as they walk past by counting intervals (1). • It is less biased than other options (1) as participants are chosen by a system rather than for a particular reason (1) which means data should be more accurate (1). Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
4(d)(i)	**AO4 (2 marks)** Award 1 mark for accurate drawing of segments. Award 1 mark for accurate shading.  	**(2)**

Question number	Answer	Mark
4(d)(ii)	**AO3 (2 marks)** Award 1 mark for an advantage, and 1 mark for a disadvantage. • Advantage: ○ Easy to see patterns for each site (1) ○ Easy to compare sites (1) • Disadvantage: ○ Does not show any correlations between questions (1) ○ This chart shows percentages rather than real numbers of responses (1). Accept any other appropriate response.	**(2)**

Question Number	Answer	Mark
4(d)(iii)	**AO3 (1 mark)** Award 1 mark for another suitable presentation method: • Bar graph (1) • Histogram (1) Accept any other appropriate response.	**(1)**

Question number	Answer	Mark

4(d)(iv)	**AO4 (2 marks)** Award 2 marks for correct answer. Award 1 mark for correct method to calculate the mean if the answer is not correct. 40 + 20 + 50 / 3 (1) 36.67 (accept 36.6/36.7/37) (1)	**(2)**

Question number	**Indicative content**		
4(e)	**AO3 (4 marks)/AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the levels-based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. Relevant points may include: **AO3** • Evaluation is likely to be linked to the use of a range of data collection methods to generate quantitative data. • Evaluation will most likely make links between the quantitative data used and how this strengthened the argument/conclusions. • Evaluation will most likely be linked to the evaluation of the use of quantitative data alongside qualitative data to form accurate conclusions. • Recognition of the extent to which the type of data collected can affect how data is analysed/ the aim is met/conclusions are made. • A supported judgement is reached about the use of quantitative data in their enquiry drawing on evidence such as strengths, weaknesses, alternatives and relevant examples using data. **AO4** • There is evidence of using different skills and techniques as part of primary fieldwork. • There is evidence of using different skills and techniques relevant to how data is collected or analysed as part of the enquiry. • There is evidence of using different skills and techniques to investigate aspects of economic activity and energy. • There is evidence of own fieldwork data i.e. reference to the field data collected by the student.		
Level	**Mark**	**Descriptor**	
	0	No acceptable response.	

Level 1	1–3	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements are supported by limited evidence. (AO3) • Few aspects of the enquiry process are supported by the use of geographical skills to obtain information, which has limited relevance and accuracy. Communicates generic fieldwork findings and uses limited relevant geographical terminology. (AO4)
Level 2	4–6	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Some aspects of the enquiry process are supported by the use of geographical skills. Communicates fieldwork findings with some clarity, using relevant geographical terminology occasionally. (AO4)
Level 3	7–8	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • All aspects of the enquiry process are supported by the use of geographical skills. Communicates enquiry-specific fieldwork findings with clarity and uses relevant geographical terminology consistently. (AO4)

Question number	Answer	Mark