

Mark Scheme (Results)

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GCE Geography (6GE03) Paper 01
CONTESTED PLANET

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| Question Number | Question |
|-----------------|---|
| 1a | Explain the classification of the selected energy resources shown (10) |
| | Indicative content |

Figure 1 is a triangular graph without a numerical scale (therefore precision not possible). The four energy resources shown contrast as one is a fossil fuel, one renewable (wind) and the other two recyclable (to different degrees).

Candidates are expected to provide reasons for the soc/eco/env positioning of the energy types but many will also question the position. They may refer to the contrasting views of different 'players' as part of their answer.

They occupy their respective positions because:

- Nuclear power produces no emissions (SO₂, CO₂) and is seen by some as environmentally friendly (could argue that due to waste and life-cycle emissions the position is wrong); socially nuclear is opposed by some on safety grounds (Fukushima, Chernobyl); economically it is costly to build and to deal with waste and decommissioning e.g. UK nuclear.
- Coal is a 'dirty' fuel as it is generally not very energy efficient per unit of CO₂ produced + emits acid rain causing gases; it is a cheap fuel due to its abundance; increasingly (at least in the developed world) it is perceived as a dirty 'fuel of the past'. Health concerns, mining safety for social.
- Wind power is green in terms of emissions, but there are social / environmental NIMBY issues if the turbines are onshore (much less opposition offshore); wind is still relatively expensive and is often subsidised to make it competitive.
- Biofuels are in theory green / carbon neutral but some might argue that over the full life-cycle of transport and processing they are much less so; they are cheap and can compete with oil but there are issues with taking up land that could grow crops to feed people.

Expect some mention of all 4 energy resources, but only an overall soc/eco/env balance. Credit other acceptable explanations.

Max 7 if only 1 or 2 energy resources are referred to.

NB: The key example in Figure 1 incorrectly indicates that coal's social acceptability is HIGH on Figure 1, whereas it is LOW on Figure 1. Accept explanations based on HIGH social acceptability of coal (providing many jobs, low risk / known technology, low cost keeps bills down) as well as LOW. Reward quality of explanation; there is no 'correct' view especially for social and environmental aspects.

| Level | Mark | Descriptor |
|----------------|------|--|
| Level 1 | 1-4 | Partial response in terms of eco/soc/env and energy resources; generalised comments lacking explanation. Structure is poor or absent. Geographical terminology is rarely used with accuracy. There are frequent grammar, punctuation and spelling errors. |
| Level 2 | 5-7 | Response with some range, details and explanations; may be unbalanced. Structure is satisfactory. Geographical terminology is used with some accuracy. There are some grammar, punctuation and spelling errors. |
| Level 3 | 8-10 | Balanced with a range of comments which explain, and may question, the classification of the energy resources. May use examples. Structure is good. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are rare |

| Question Number | Question |
|--|--|
| 1b | Using named examples, evaluate the economic and political impacts of disruption to energy supply pathways. (15) |
| | Indicative content |
| <p>Energy supply pathways include any movement of fossil fuels or electricity from supplier to consumer.</p> <p>This includes pipelines for oil and gas, e.g. across Europe and Central Asia, or Alaska as well as offshore to onshore. Also electricity grids and transboundary grids such as the UK interconnectors to France and Belgium. It also includes shipping routes for oil, coal, uranium and LNG. Pathways can also be internal, such as the disruption caused by the fuel price protests in the UK in 2000.</p> <p>Disruptions can occur for a number of reasons such as accidents, e.g. the 2010 Gulf oil spill (and possible knock-on effects for wider offshore drilling), natural hazards e.g. hurricane Katrina, Japanese tsunami; political and economic decisions such as the Ukraine / Russia disputes in 2006 and 2009, terrorist attacks and piracy especially at choke points. The current Iran situation and the Straits of Hormuz might be referred to. Price hikes such as the 1973 oil crisis or recently in Nigeria can also effectively disrupt supplies.</p> <p>Impacts include:</p> <p>Economic</p> <ul style="list-style-type: none"> • Oil price has spikes contributing to rising costs and even recession. • Increased costs for industry, which leads to inflation and rising prices. People spend proportionately more on energy and less on other goods. Fuel / energy poverty. • Slow down in development, e.g. in South Africa and India due to lack of electricity supply (poor long term planning); deterring investment. • The need to develop alternative routes, e.g. the Nabucco and Nord-stream pipelines. <p>Political</p> <ul style="list-style-type: none"> • People may take to the streets if they feel they cannot get, or afford, energy, e.g. fuel protests in UK 2000 • Undermining of the authority of governments. • Escalating conflict (diplomatic or actual) over energy suppliers, e.g. Russia and Ukraine. • Pressing need to search for new sources e.g. new pipelines, domestic resources which could increase conflict (ANWR, biofuels, wind) • Some might argue that because of the risks, energy prices are kept artificially low by subsidies e.g. in India, the Middle East. <p>Better answers may make judgments about how serious the impacts are e.g. political –v- economic, or when disruptions are local/ internal –v- international.</p> <p>Credit other impacts and examples.</p> | |

| Level | Mark | Descriptor |
|---------|-------|--|
| Level 1 | 1-4 | One or two sensationalist impacts with factually unsound support. Structure is poor or absent. Explanations are over-simplified and lack clarity. Geographical terminology is rarely used with accuracy. There are frequent grammar, punctuation and spelling errors. |
| Level 2 | 5-8 | Some impacts, but unbalanced and lacking in detail and use of examples. Structure is satisfactory. Political and economic not clear, or one only. Explanations are clear, but there are areas of less clarity. Geographical terminology is used with some accuracy. There are some grammar, punctuation and spelling errors. |
| Level 3 | 9-12 | A range of impacts, both economic and political implied but unbalanced. Implies evaluation; some examples. Structure is good. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are rare. |
| Level 4 | 13-15 | Sound evaluation of impacts using examples to support; balanced between political and economic. Carefully structured. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are very rare. |

| Question Number | Question |
|-----------------|--|
| 2a | Suggest reasons for the changes to water supply quality between 1990 and 2008. (10) |
| | Indicative content |
| | <p>Figure 2 shows 4 sets of data for 3 regions – SSA appears twice, as 'all' and 'urban'.</p> <p>The left hand side of each graph shows data for 1990 and the right for 2008, with the trend in between.</p> <p>Note that the starting points in 1990 are very different, as are the trends.</p> <ul style="list-style-type: none"> • LAC: highest levels of piped water in 1990, rising by 12% by 2008 suggesting an improving water supply situation with 4/5ths of people now with piped supply. Reasons: relatively developed region with advancing economy; improvements being made to megacities (slum schemes) and spread of formal water network. • E Asia: Dramatic improvement in piped water from 55% to 83% (+28%) and dramatic decline in unimproved. Reasons: likely to be related to the 'rise of China' and the benefits of economic growth and planned urbanisation; some might relate to population control growth, i.e. one child policy making it easier to improve water supply. Infrastructure investment e.g. South North transfer. • SSA: no improvement in piped water to speak of, but a 10% gain in improved water supply: Reasons: the work of NGOs and self-help (WaterAid); poverty might be cited as a reason for the limited overall progress. Many people are rural and therefore rely on rivers and ponds. • SSA Urban: dramatic decline in piped water, so falling water quality overall. Reasons: rapid, unplanned urbanisation in megacities, poverty, lack of government action and reliance on (expensive) water vendors. <p>There will be other acceptable reasons which should be credited. Max 7 if only two bars are discussed.</p> |

| Level | Mark | Descriptor |
|----------------|------|---|
| Level 1 | 1-4 | Descriptive response with a few general reasons given; unbalanced and focused on one or two parts of Figure. Structure is poor or absent. Geographical terminology is rarely used with accuracy. There are frequent grammar, punctuation and spelling errors. |
| Level 2 | 5-7 | Range of reasons given but of variable quality / depth; some balance but may tend to repeat. Structure is satisfactory. Geographical terminology is used with some accuracy. There are some grammar, punctuation and spelling errors. |
| Level 3 | 8-10 | Range of different reasons for the trends with some detail. May use examples, e.g. of megacities. Structure is good. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are rare |

| Question | Question |
|-----------|---|
| 2b | Evaluate the consequences, for different players, of an increasing gap between water supply and demand. (15) |
| | Indicative content |
| | <p>Players refers to users of water i.e. consumers in the developed and developing world, water companies, governments, businesses –possibly even the environment. Candidates might take a developed or developing world approach, or both. Note that consequences can be positive or negative.</p> <p>The 'gap' implies rising demand and static, or even falling, supply, and therefore increasing pressure on water supplies.</p> <ul style="list-style-type: none"> • For people in the developed world the result is likely to be rising costs and possibly restrictions on supply, especially where use is considered a luxury, e.g. swimming pools; short term hose-pipe bans and longer term policies such as metering or conservation gardening etc. • Some consumers might be insulated by technology, e.g. desalination plants in the Middle East. • For developing world consumers the consequences could be spiralling costs and severe shortages, i.e. a water crisis in locations such as India or parts of Africa. Farmers could suffer direct losses. Costs from water vendors in urban area. • Increased demand for NGOs to step in and try to improve water supplies for the most in need. • Increased conflict between governments if transboundary issues are involved plus increased pressure to spend vast sums of money to ensure supply, e.g. in China. There are lots of possible examples here. • Some might argue that water companies are likely to do well even if supply and demand do not match as they can charge more and supply less. <p>Be flexible as there are a wide range of possible players that could be mentioned. Some might take a winners and losers approach. Better answers should make an evaluation / judgment about the consequences. This could be that the consequences will be worse for some players than others, or that a type of consequence will be worse e.g. the social impacts on health, or that some regions will be worse hit. Beneficial consequences to some players –v- negative ones to others.</p> |

| Level | Mark | Descriptor |
|---------|-------|---|
| Level 1 | 1-4 | A few impacts linked to some generalised players with little depth. Structure is poor or absent. Explanations are over-simplified and lack clarity. Geographical terminology is rarely used with accuracy. There are frequent grammar, punctuation and spelling errors. |
| Level 2 | 5-8 | Some range of players and consequences but less detail and likely to be narrow. Structure is satisfactory. Explanations are clear, but there are areas of less clarity. Geographical terminology is used with some accuracy. There are some grammar, punctuation and spelling errors. |
| Level 3 | 9-12 | Covers a range of players and consequences in some detail; attempt to use examples; implied evaluation. Structure is good. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are rare. |
| Level 4 | 13-15 | Genuine evaluation with reference to a range of players and detailed consequences. Likely to be supported by examples and at the top end addresses the 'increasing' gap. Carefully structured. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are very rare. |

| Question Number | Question |
|-----------------|---|
| 3a | Explain how physical factors influence the distribution of biodiversity shown (10) |
| | Indicative content |
| | <p>The map shows plant species diversity; many candidates will simply refer to 'biodiversity' and not focus on plants specifically and this is acceptable. If examples of marine ecosystems are used, accept this if it makes sense in the context of the map. Expect some description to appear within the explanations. Be wary of 'at the top / in the middle' style answers as there are some named places and latitude on the map.</p> <p>Answers could be structured by factors influencing biodiversity or by the level of biodiversity.</p> <ul style="list-style-type: none"> • Limiting factors: extreme regions where limiting factors restrict growth, i.e. extreme cold, aridity and lack of sunlight in Antarctic, the Arctic, Tibetan plateau and extreme aridity in central Australia. Species need to be specially adapted to survive in the hostile environment. • Perfect conditions for growth: essentially close to the equator where heat, light and moisture are always available and seasonality is minimal; conditions maximise biomass and stratification producing a wide range of niches and continual growth. Some might see coasts (e.g. Australia) as having better conditions due to rainfall. • Endemism: unique species have evolved on islands in Indonesia, PNG and Philippines so levels exceed 5000 species 10,000 km² • Altitude: rapid change in temp / rainfall over short distance produces many different ecosystems all with different species. • Size and age – e.g. how long an area has been undisturbed; other factors may be mentioned. <p>Answers should focus on physical factors, as the pattern is the natural one.</p> |

| Level | Mark | Descriptor |
|----------------|------|--|
| Level 1 | 1-4 | A few generalised ideas on one or two factors poorly related to the map; may drift into human factors. Structure is poor or absent. Geographical terminology is rarely used with accuracy. There are frequent grammar, punctuation and spelling errors. |
| Level 2 | 5-7 | Some explanations for some of the distribution with a reasonable understanding of some physical factors. Structure is satisfactory. Geographical terminology is used with some accuracy. There are some grammar, punctuation and spelling errors. |
| Level 3 | 8-10 | A range of explanations linked to Figure 3 with a good understanding of the physical factors which influence biodiversity. Structure is good. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are rare |

| Question Number | Question |
|-----------------|---|
| 3b | With reference to a named global ecosystem, assess the global and local value of its goods and services (15) |
| | Indicative content |
| | <p>Global ecosystems include coral reefs, any type of forest or grassland, and oceans. There should be some reference to a chosen biome rather than simply one location. There should be a clear separation of goods and services, but some candidates may refer to regulating and provisioning services (goods) which is equally acceptable, or the MEA provisioning (goods), regulating, cultural and supporting services. Goods might tend to be seen as more locally important, whereas services might be more global, but it will depend on the ecosystem chosen.</p> <p>Services might include:</p> <ul style="list-style-type: none"> • Flood control / coastal protection • Carbon sequestration • Climate regulation • Cultural / aesthetic services (linked to tourism) <p>Goods could be:</p> <ul style="list-style-type: none"> • Food (hunting, fishing) • Building materials, timber • Genetic material for crops / medicines • Cultural goods <p>Be wary of goods that involve the destruction of the ecosystem in question, e.g. HEP dams, mining etc as these actually value land not the ecosystem which is destroyed.</p> <p>Expect specific links to the chosen ecosystem plus an assessment of importance at both local and global scales</p> <p>Better answers should assess local and global value i.e. which is more important? This could be achieved by arguing for local or global, or goods versus services, for instance.</p> <p>Max 12 for one location e.g. Galapagos. If more than one global ecosystem / biome, credit the best.</p> |

| Level | Mark | Descriptor |
|---------|-------|---|
| Level 1 | 1-4 | Description of one or two goods and services; may not be clear on either. Structure is poor or absent. Explanations are over-simplified and lack clarity. Geographical terminology is rarely used with accuracy. There are frequent grammar, punctuation and spelling errors. |
| Level 2 | 5-8 | Outlines some goods and/or services but limited on local/ global and lacks meaningful assessment. Structure is satisfactory. Explanations are clear, but there are areas of less clarity. Geographical terminology is used with some accuracy. There are some grammar, punctuation and spelling errors. |
| Level 3 | 9-12 | Explains a range of goods and services and links to local and global value with some implied assessment; clear on the global ecosystem chosen. Structure is good. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are rare. |
| Level 4 | 13-15 | Sound assessment of goods and services and value at both scales, well supported by examples. Carefully structured. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are very rare. |

| Question Number | Question |
|-----------------|--|
| 4a | Using Figure 4 and your own knowledge, explain the advantages and disadvantages of inward investment for developing countries. (10) |
| | Indicative content |

Figure 4 shows inward investment by 5 countries (the BRICs plus South Korea) into 5 sub-Saharan African countries. Responses should focus on the adv / disadv of this investment but should also use other examples.

Answers could be structured using soc/eco/env or similar structures.

- A general observation might be that few of the countries are politically stable and political and economic pressure from a BRIC may not improve matters.
- The investors in general may be viewed as neo-colonial
- The people may feel their country is being sold to the highest bidder; alternatively the jobs and investment by 'new' countries may be viewed more positively than that from the EU/USA.
- Credit reference to the providers of the investment if they are developing countries i.e. China, Brazil & India.

| Fig 4 | Advantages | Disadvantages |
|--------------------------|--|---|
| Farmland, Sudan | Bringing un/under used land into production; jobs | Exports of food from a food insecure region could be seen as unethical; may refer to 'land grabs'. |
| Flower growing, Ethiopia | Fairly high value export; likely to provide many processing jobs (as it does in Kenya) | Land could be used for food Profits go to India Exploitation of workers, low wages |
| Copper and Cobalt, DRC | Very large investment that DRC probably could not afford on its own. Technical mining expertise brought | Very valuable raw materials leaving the country with minimal processing; China gains the value-added Jobs may go to Chinese migrants (they often do) |
| Agr research, Ghana | Might be seen as more positive and less exploitative than the others as research could benefit Ghana; state owned may see less profit motivated than private | Motives might be questioned |
| Gas, Nigeria | Royalties and some income It is a joint-venture and some technology transfer is likely. | Exporting the country's energy wealth; little profit and few jobs; Rivers State / Ogoni people may be mentioned |

For L3 it is not necessary to comment on every investment but some range is required, i.e. 3 of the investments or more; it is possible to make similar points about different investments. Good candidates are likely to come to a conclusion.

| Level | Mark | Descriptor |
|----------------|------|--|
| Level 1 | 1-4 | Unbalanced and a few general comments, most likely on disadvantages. Structure is poor or absent. Geographical terminology is rarely used with accuracy. There are frequent grammar, punctuation and spelling errors. |
| Level 2 | 5-7 | Some range of explanations with some disadvantages and advantages but may be unbalanced, with some details. Structure is satisfactory. Geographical terminology is used with some accuracy. There are some grammar, punctuation and spelling errors. |
| Level 3 | 8-10 | Good range of explanations and balance between advantages and disadvantages with some detail; likely to move towards an overview and uses own knowledge. Structure is good. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are rare |

| Question Number | Question |
|-----------------|--|
| 4b | Assess the global environmental and geopolitical implications of the rise of the BRICs (Brazil, Russia, India and China) (15) |
| | Indicative content |

Accept discussion of the 4 BRICS, plus some candidates may see the question from the point of view of implications for the developed world as their power slides (there is no requirement for this).

There should be some global element, i.e. an overview of discussion of specific global problems, e.g. carbon emissions.

Implications could be positive or negative.

| Geopolitical | Environmental |
|--|---|
| <ul style="list-style-type: none"> Increasingly regional world, i.e. multi-polar spheres replace today's uni-polar world; possible rise in regional tensions, e.g. China and India. Unstable multi-polar world. Shifts in military balance of power e.g. Chinese expansion in Pacific. Changes of membership within global IGOs such as the UN or World Bank to reflect shifts in power G8 power giving way to G20 or G2 possibly linked to debt/ economic crisis. A bi-polar USA / China world might be argued for | <ul style="list-style-type: none"> Renewed leadership on global environmental problems. Falling costs of renewable and environmental technologies due to innovation in the BRICs Increased pressure on a wide range of resources as consumption in the BRICs rises. Increasing carbon emissions and therefore global warming Possible resource crises, e.g. water, rising demand for land / food. |

Better answers should provide an assessment / judgment; this could be in the form of whether geopolitical or environmental implications are likely to be more significant; alternatively it could be in terms of 'winners' and 'losers' e.g. China -v- USA/ EU. Another possibility is to argue the differing seriousness of specific implications.

Max 10 for only 1 country is mentioned.

| Level | Mark | Descriptor |
|---------|-------|---|
| Level 1 | 1-4 | Unbalanced; generalised comments on one or two issues, e.g. global warming. Structure is poor or absent. Explanations are over-simplified and lack clarity. Geographical terminology is rarely used with accuracy. There are frequent grammar, punctuation and spelling errors. |
| Level 2 | 5-8 | Some range of issues: geopolitical and environmental not clear, or one only: lacking in detail. Structure is satisfactory. Explanations are clear, but there are areas of less clarity. Geographical terminology is used with some accuracy. There are some grammar, punctuation and spelling errors. |
| Level 3 | 9-12 | A range of geopolitical and environmental issues implied with some details, some link to global scale and implied assessment. Structure is good. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are rare. |
| Level 4 | 13-15 | Sound assessment of a range of geopolitical and environmental implications which is balanced. Carefully structured. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are very rare. |

| Question Number | Question |
|-----------------|--|
| 5a | Suggest why the people shown have contrasting views on the priorities for development (10) |
| | Indicative content |
| | <p>The four people are all expressing particular views; some may be known to candidates but this is not the focus on the question; there might be some comment on how 'who they are' influences 'what they say'.</p> <p>Expect some discussion of the individual views and perhaps some wider discussion of the meaning of development. Good candidates might point out that the views may contrast but don't necessarily contradict one another.</p> <ul style="list-style-type: none"> • Kofi Annan: prioritises gender equality. Reasons for this might be the role women play in the home in terms of education and health (e.g. Aids/HIV health), as well as the need for them to be in control of their own fertility (population); they are often critical to food production; there is also a moral issue of the need for equality. Equality of opportunity to work would improve incomes. • Gro Harlem Brundtland: prioritises meeting basic needs. Reasons could be because people who are hungry and ill cannot help themselves so further development is not possible; the 1 billion hungry might be mentioned. • Paul Kagame: takes a more economic view of development, i.e. the need for inward investment and trade (pro-globalisation?). Reasons: perhaps because jobs and income are, in his view, a pre-condition for development, and food and health will improve when jobs come. 'Not aid' perhaps reflects the wish to not be seen to take hand-outs but to develop independently. • Jimmy Carter: takes the view that some people seem to 'miss out' from globalisation (perhaps SSA). Reasons: implies that not everyone can benefit from globalisation i.e. it's unfair - candidates may contrast China with SSA. Might be seen as supporting Brundtland's view. <p>Max 7 if only 2 views are discussed.</p> |

| Level | Mark | Descriptor |
|----------------|------|---|
| Level 1 | 1-4 | Likely to describe /rewrite Fig 5 with little further comment; may provide simple partial explanations for some. Structure is poor or absent. Geographical terminology is rarely used with accuracy. There are frequent grammar, punctuation and spelling errors. |
| Level 2 | 5-7 | Some range of reasons suggested for some of the views; takes each in turn and may be unbalanced or not fully explained. Structure is satisfactory. Geographical terminology is used with some accuracy. There are some grammar, punctuation and spelling errors. |
| Level 3 | 8-10 | Good range of detailed reasons linked to development priorities; may compare or take an overview. Structure is good. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are rare |

| Question Number | Question |
|-----------------|--|
| 5b | Using named examples, examine the extent to which the development gap occurs within countries as well as globally. (15) |
| | Indicative content |
| | <p>Answers should consider both the global gap and local / national scale gaps. The global gap might be discussed by considering wealth or HDI at a global scale, i.e. the North –South divide; better candidates are likely to see more subtle patterns involving NICs and perhaps Sub-Saharan Africa.</p> <p>Within country / more local scale ‘gaps’ might focus on very localised differences but also on gaps which are essentially national in scale:</p> <ul style="list-style-type: none"> • Urban differences in megacities, contrasting recent slums with areas of middle class and elite housing. • Urban versus rural contrasts, e.g. in China or India; core versus periphery concepts • Geographical divides within countries, i.e. north-south, coastal versus interior • Gaps based on gender • Gaps based on caste, race or religion <p>All of these localised gaps are present in the spec. Examples could be from countries at any level of development.</p> <p>Credit candidates that argue that sometimes these local gaps have been successfully reduced, e.g. Kerala, or self-help housing schemes in the developing world, or China’s efforts to develop its interior.</p> <p>Better answers should examine the extent of the development gap at the two scales. Evaluative comments could take the form of arguing that there is no gap at a global scale, but more of a continuum. Could argue the gap is now between LDCs and the rest of the world. Local gaps could be argued as more significant (or less) or particular differences e.g. gender or race as especially important.</p> |

| Level | Mark | Descriptor |
|---------|-------|--|
| Level 1 | 1-4 | Generalised statements relating to the north-south divide / other 'gaps', with little or no support. Structure is poor or absent. Explanations are over-simplified and lack clarity. Geographical terminology is rarely used with accuracy. There are frequent grammar, punctuation and spelling errors. |
| Level 2 | 5-8 | Some 'gaps' outlined in a descriptive account; likely to be unbalanced and lacking examples; scale may be unclear. Structure is satisfactory. Explanations are clear, but there are areas of less clarity. Geographical terminology is used with some accuracy. There are some grammar, punctuation and spelling errors. |
| Level 3 | 9-12 | Some examination of development gaps, with some details but examples are not fully developed. Structure is good. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are rare. |
| Level 4 | 13-15 | Sound examination of the extent to which local / country gaps exist within a global framework; detailed exemplification. Carefully structured. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are very rare. |

SECTION B

| Question Number | Question |
|-----------------|---|
| 6a | Explain the contribution that technology has made to Scandinavia's development level and quality of life. (12) |
| | Indicative content |
| | <p>Scandinavian countries rank very high on development measures (Fig 1) and in terms of the HPI index which implies satisfied, long-lived people (quality of life) using resources efficiently (equation on page 1). There is an overlap between level of development and quality of life, but expect some explanation of economic and social aspects linked to technology.</p> <ul style="list-style-type: none">• All 3 countries are in the top 15 in terms of PPP GDP per capita (high paying jobs, tertiary and quaternary sector; access to a huge range of technology e.g. the internet statistics)• This is confirmed by Fig 4 which shows all three countries to have high levels of Tertiary education and above average % of GDP spent on education.• Fig 3 states the 3 countries are within the top 10 (Sweden is top) in terms of network readiness (the ability to take advantage of opportunities in ICT).• Fig 5 suggests Scandinavia invests heavily in R&D (high paid jobs) and its educated workforce is innovative (patents = royalties = money)• Could comment that the very high Democracy Index (Fig 1) scores suggest unfettered access to information in all its forms.• All 3 countries rank very high in terms of HDI (Fig 1), which includes life expectancy, literacy and education levels which suggests access to health and education technology is very good• HPI (Fig 2) suggests life satisfaction is high which might be a result of access to technology and labour saving devices, as well as being related to wealth.• High environmental quality might be linked to HPI; not that a high score can be linked to a low carbon footprint, and possibly technology helping to utilise resources efficiently and cleanly. <p>Many candidates will be able to explain Scandinavia's quality of life and development but for Level 3 some link to technology is needed.</p> <p>Credit candidates who bring in synoptic ideas of other measures of development and quality of life from their research e.g. gender equality, social justice in the region.</p> <p>Synoptic linkages</p> <p>Unit 3 Bridging the development gap – ways of measuring development</p> <p>Unit 1 – the benefits that flow from being 'connected'</p> <p>As part of research candidates may have looked at issues such as income equality, and have further details of HPI or HDI. Other high (or even low) HPI, HDI or NRI countries might be used as parallel examples.</p> |

| Level | Mark | Descriptor |
|---------|------|---|
| Level 1 | 1-4 | A few general comments relating to high quality of life or development in Scandinavia; patchy use of resources. Structure is poor or absent. Explanations are over-simplified and lack clarity. Geographical terminology is rarely used with accuracy. There are frequent grammar, punctuation and spelling errors. |
| Level 2 | 5-8 | Some explanation of high quality of life / development level using the resources; limited link to the role of technology. Structure is satisfactory. Explanations are clear, but there are areas of less clarity. Geographical terminology is used with some accuracy. There are some grammar, punctuation and spelling errors. |
| Level 3 | 9-12 | Sound explanation of high quality of life and development level linking to the role of technology (possibly other factors). Structure is good. Explanations are always clear. Synoptic. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are very rare. |

| Question Number | Question |
|-----------------|--|
| 6b | Assess the extent to which Scandinavia has minimised the environmental costs of using technology and resources. (14) |
| | Indicative content |
| | <p>Costs should focus on environmental, but accept wider social or economic if broadly linked to environmental issues. Do not expect a differentiation between technology and resources to be made.</p> <p>Candidates should recognise that there are significant differences across the region and the countries cannot always be lumped together.</p> <p>Evidence in favour of a 'green Scandinavia' includes:</p> <ul style="list-style-type: none"> • Early adopters of carbon taxes; some candidates might link to the synoptic idea of 'polluter pays' or have found that there are many exemptions in some countries, so all is perhaps not quite as 'green' as it seems. • Reliance on fossil fuels is low in Sweden and Norway and renewables are high in all countries, although the mix is different; View 3 supports this. • All three countries tax petrol and diesel heavily which could be seen as taxing pollution (or raising revenue, as the UK Gov is often accused of); there is some evidence in Fig 10 that car ownership in Denmark and Norway is much lower than GDP would suggest which may suggest green taxes work. • Norway and Sweden do seem to have decoupled carbon emissions and GDP (Fig 9) to produce highly efficient economies compared to others in Europe. • Sweden had exceeded its Kyoto target by 7% by 2010. • Fig 12 suggests that at least some Scandinavian companies are at the forefront of renewable energy and in the case of Volvo, have long-standing concerns about the negative consequences of technology. <p>On the other hand:</p> <ul style="list-style-type: none"> • Fig 6 shows that overall ecofootprints are very high; Norway has a low footprint for its wealth but a very high fishing footprint, plus it is an exporter of oil and gas (an exporter of pollution?); in total ecofootprint terms Denmark comes out poorly in relation to its GDP (intensive farming). • Sweden's nuclear power use may be questioned by some, plus Denmark uses a very similar % of fossil fuels to the average for Europe (Fig 7). • Kyoto progress has been mixed (Fig 11); by 2010 Denmark was only ½ way to its (very challenging) 2012 target; Norway had increased emissions by 2010 to 10% above its 1% target. <p>Expect and summary / overview from some candidates i.e. how far has the region managed to minimise environmental costs, or is it really just very similar to other countries / regions?</p> <p>Synoptic linkages</p> <p>Research information e.g. of carbon decoupling or specific examples of renewable energy.</p> <p>Unit 3 energy – types of energy resource and the impacts of technologies.</p> <p>Unit 1 managing climate change.</p> |

| Level | Mark | Descriptor |
|---------|-------|--|
| Level 1 | 1-4 | A few lift offs from the resources with generalised and inaccurate statements relating to environmental issues. Structure is poor or absent. Explanations are over-simplified and lack clarity. Geographical terminology is rarely used with accuracy. There are frequent grammar, punctuation and spelling errors. |
| Level 2 | 5-7 | A focus on environmental issues, but likely to be an uncritical selection of resource information to prove 'greenness'. Structure is satisfactory. Explanations are clear, but there are areas of less clarity. Geographical terminology is used with some accuracy. There are some grammar, punctuation and spelling errors. |
| Level 3 | 8-11 | Recognises the differences between countries and uses the resources effectively; linked to minimising environmental costs and some implied assessment. Structure is good. Some reference to wider links. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are rare. |
| Level 4 | 12-14 | Sound assessment of minimising environmental costs, which recognises national differences to carefully weigh a range of evidence. Likely to provide an overview. Carefully structured. Strong synoptic links. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are very rare. |

| | |
|---|---|
| Question Number | Question: Study Figure 13. |
| 6c | Evaluate the contribution that the technologies shown might make in reducing ecological footprints in Scandinavia and beyond. (14) |
| | Indicative content |
| <p>The 3 technologies focus on capturing carbon, changing modes of transport and making energy less carbon intensive. There is also an eco-footprint graph which shows that Scandinavia was making good progress reducing footprints between 1996 and 2003 but that they increased up to 2005 (some candidates might link this to View 2). The three future scenarios shown in Fig 13 might be used as a structure.</p> <ul style="list-style-type: none"> • CCS is a new technology, pioneered by Norway but yet to be up-scaled worldwide (there are several trial plants); the Sleipner system prevents pollution being released as a by-product of oil production but the Mongstad plant would capture combustion emissions which is the ultimate goal of CCS. View 1 undermines the economics of CCS to some extent and some candidates might argue that it is a class techno-fix where an attitudinal fix is really what is required, i.e. use less, conserve more. Some might argue it's actually 'business as usual' • Copenhagen is clearly a very green city from a transport perspective with huge investment in cycling; the technology is a mix of simple mechanical and complex electronics (the traffic light) and is about changing behaviour and lifestyles; can this be applied in other cities which are bigger, hillier and much poorer? Copenhagen's metro is a major investment for a city of only ~1 million. These schemes might be seen as sustainable rather than radical as they operate in many other locations. • GoBiGas might be seen as the more radical approach, or an extension of existing technologies; it aims to replace fossil fuels with forestry waste (it could be more or less carbon neutral over the long term) and tie power generation into district heating / CHP to increase efficiency by using waste heat; retrofitting district heating is costly and difficult. View 5 sets GoBiGas in a broader Swedish context which might be interpreted as showing the Swedes were early adopters of environmental sustainability. <p>Better answers will separate Scandinavia from elsewhere, and should discuss whether these technologies can be applied outside these very developed countries (see View 4) – 'beyond' in the question. Credit candidates who, in addition to Fig 13, bring in other examples of technology.</p> <p>Note that Figure 6 shows the carbon part of the ecological footprint; candidates could argue that the 3 schemes would have minimal impact on the overall ecological footprint.</p> <p>Synoptic linkages</p> <p>Research on CCS is likely to appear.</p> <p>There are obvious parallel examples in London, Curitiba, Amsterdam and many others.</p> <p>Unit 3 energy security</p> | |

| Level | Mark | Descriptor |
|---------|-------|---|
| Level 1 | 1-4 | Descriptive and narrow response; may focus on 1 technology and be overly reliant on the resources. Structure is poor or absent. Explanations are over-simplified and lack clarity. Geographical terminology is rarely used with accuracy. There are frequent grammar, punctuation and spelling errors. |
| Level 2 | 5-7 | Response that explains the green credentials of the technologies using information in the resources. Structure is satisfactory. Explanations are clear, but there are areas of less clarity. Geographical terminology is used with some accuracy. There are some grammar, punctuation and spelling errors. |
| Level 3 | 8-11 | Some evaluation in an answer that compares aspects of the three technologies and has some detail; likely to focus on Scandinavia only. At the top end may refer to the 3 futures. Structure is good. Some reference to wider links. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are rare. Max 10 if 2 technologies only. |
| Level 4 | 12-14 | Sound evaluation which links to the futures graph, Scandinavia and beyond. Carefully structured. Strong synoptic links. Explanations are always clear. Geographical terminology is used with accuracy. Grammar, punctuation and spelling errors are very rare. |

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