WJEC 2014 Online Exam Review

GCE Geography G4 1204-01

All Candidates' performance across questions

Question Title	N	Mean	S D	Max Mark	F F	Attempt %
1	3037	6.1	1.7	10	61	99.9
2	3038	6.6	1.5	10	65.5	99.9
3	3015	5.8	1.9	10	58.3	99.2
4	3025	14.1	4.4	25	56.5	99.5
5	3019	14.7	4.1	25	58.9	99.3

1
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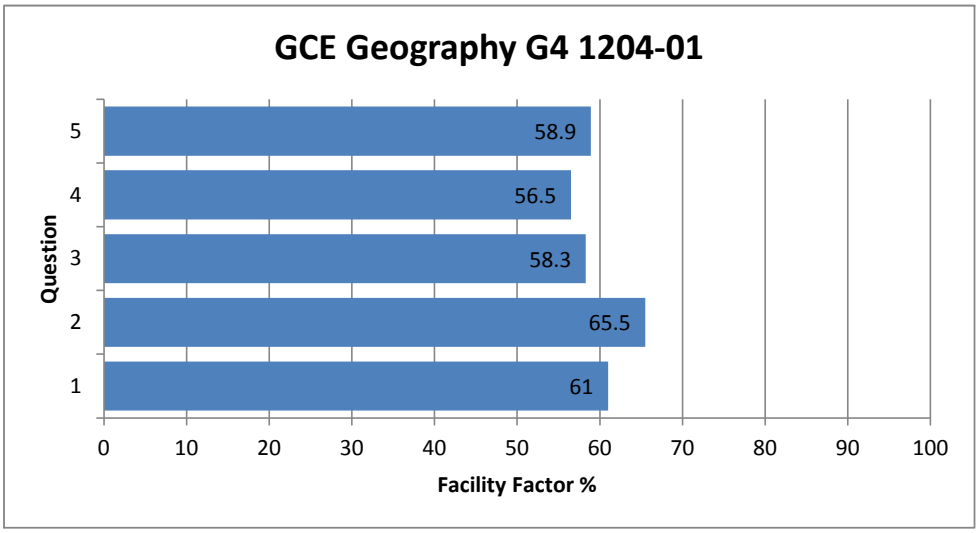

Answer **all** *questions.*

SECTION A

In this section you may use information from the **Resource Folder** *and your own research.*

0 1 Outline the physical factors affecting food production in **one or more** areas. [10]
(approximately 13 minutes)

1A

In the Cambridge area of east Anglia, where it's got very flat land, food production is higher than anywhere else in the UK. One factor which is positive for food production is that of the soil. The soils here are mostly chalky boulder clay and brown earth on chalk, both of which have high lime content which makes them great for farming. The rain in Cambridge also contributes to the great food production. The rain, as well as the average temperature stay relatively the same throughout the harvesting seasons, meaning maximum output can be achieved. this rain and temperature, mixed with the types of soil allow many crops to be grown here, such as wheat, potatoes and corn. In India the situation is very contrasting. Physical factors in India generally make it very difficult for farmers to grow any sort of good crop. Some physical setbacks for Indian farmers include the monsoons, while admitedly they do rely on them for some crops, but with climate change they are becoming much more powerful, damaging top soil which takes 25,000 years to grow back. Another factor in India is the poor quality of soil and the general atmosphere of rural areas. The soil, largely due to being overused in the green revolution in the 1960s, is now very poor quality and the overall temperature of India is just generally too warm for a lot of crops to grow, with it often being in excess of 30*C, the plants need a lot of water, and apart from the monsoons, this is very difficult to come by in India, so the crops often die due to the heat.

1B

Physical factors affecting food production include soil fertility, relief, and geology. Figure 13 shows that Cambridge may provide a high yield of crops as it lies on land rich in alluvial deposits and minerals. as it is liable to flooding, this characteristic of the soil may be enhanced regularly. Figure 12 shows highs of 17*C in July and August which present good conditions for growth.
A reservoir, for example in the USA, may be enriched by impermeable, steep hillsides that increase runoff into the accumulate supply.

1C

There are 4 main factors affecting food production in the Cambridge area, temperature, precipitation, sunlight and soil quality. Temperature in temperate climates such as the U.K. averages between 5-15*C throughout the year, but due to the location of east anglia it's temperature is largely influenced by continental winds making for hotter summers and colder winters. Temperature is a very restrictive factor in the Cambridge area as it prohibits the growth of many crops such as Haricot beans that need 19*-28*C temperature, even though the UK only reaches a maximum of 17*C in the Cambridge area. In contrast, high temperatures are equally damaging in Kenya where green beans can lose a day of shelf life for every hour they are in direct sunlight after being picked in 25*C+ conditions. Precipitation is also a limiting factor for Cambridge the maximum per month is only 54 in June and October. This necessitates the use of irrigation such as is used in Egypt for the growth of potatoes where 500 litres of water are pumped from groundwater sources to produce 1 kg of potatoes.
Sunlight is also a limiting factor in Cambridge due to changing seasons causing variation between 50 hours in December and 191 hours in July per month. Cambridge does however have excellent soil quality as can be seen in figure 13. In the Netherlands however both these factors are circumvented by the use of hydroponics which provides 24 hours growing light and does not need soil. Overall, Cambridge is

not favourable physically for growing many types of crop due to various climate limitations.

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Answer **all** *questions.*

SECTION A

In this section you may use information from the **Resource Folder** *and your own research.*

0 2 Explain some of the ways in which food production may be increased. [10]
(approximately 13 minutes)

2A

Food production can be increased in many ways. One of these is using high yielding varieties of seeds such as Mexican dwarf wheat, as used in the Green Revolution in India. Because the grains are shorter, it makes it a more uniform crop, so less energy is needed to cut it down. From the introduction of HYV's and the green revolution, food production has increased from around 82 million tonnes in 1964, to 202 million tonnes in 2000, in India.

Growing under plastic like that used sometimes to grow strawberries and potatoes, also helps to increase food production. The plastic helps absorb heat better so even if the external air temperature is not high enough to grow certain crops, optimal temperature and conditions can be reached under the plastic sheet, along with using drip irrigation. The plastic sheets are also biodegradable so it is better for the environment and soil fertility than using artificial chemicals.

Hydroponics, such as those used at Thanet Earth Greenhouses in Kent, helps to improve food production and efficiency. Crops are grown in nutrient rich solution without soil, and like at Thanet Earth, the greenhouses are water and energy self-sufficient, and they can produce energy for the national Grid. Without Thanet Earh providing optimal out-of-season growing conditions for salad crops such as tomatoes and cucumber, the UK would otherwise have to import from the Hook of Holland.

2B

One way food production can be increased is by increasing the use of Hydroponics and aeroponics. Thanet Earth is a place in Kent where they use hydroponics to farm extensively. This is sustainable environmentally as they trap rain water from the roofs and use it to grow crops. Using this extensive method is a good way to increase food production as it doesn't take up much room and produces high yield, so there is less waste product and more to eat, increasing food production.

GM crops are another good way of increasing food production. This is because the genetically modified crop can survive harsher conditions and therefore be used as pests won't limit food production. They also modify the crop so it has less waste product so that it increases the amount that can be eaten, increasing food production. However, this may not be sustainable as pests may adapt to these changes in the crops, causing super pests that cant be controlled, so this type of crop may not be sustainable for the future, and only the present. India's Green Revolution has introduced GM crops to India as it has made farmers jobs easier, allowing crops to survive certain conditions. Howver, this is also not sustainable as in Bihar hazards are too intense so it widens the gap between the rich and the poor, as the people in Punjab can afford to use these GM crops and there is hardly any setback, which leaves farmers in Bihar suffering.

2C

Food production can be increased by making improvements in agriculture. One example of the improvements that can be made is genetic modification. This includes genetically engineering crops in order to make them more efficient. In many ways this can be very successful because the crops can be made more resistant to things like insect pests, or drought. However, a huge disadvantage of genetically modified crops is the general tabboo and stigma that is tied to them. Despite improving the efficiency of agriculture, genet modification on a larger scale could seriously affect the sales of food products that have been genetically modified - therefore causing more food waste and

not actually contributing positively to our ability to meet the demands that are set by an increasing population.

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Answer **all** *questions.*

SECTION A

In this section you may use information from the **Resource Folder** *and your own research.*

0 3 Outline reasons why some cities are growing in areal extent. [10]
(approximately 13 minutes)

3A

Most cities tend to grow in areal extent due to the large populations and the lack of space, the UK has had a 0.56% of percentage growth at numbers from 2000 being 58,886,100 people reaching levels of 62,262,000 in 2010 which is a huge increase, the cheapest solution to this is to build large apartment spaces/blocks which can be 20 levels high an house a large chuck of people without taking up any more space on the ground. The number of households is projected to grow to 27.5 million by 2033 and an increase of 27% of households over these years which means that the areal build of houses will benefit all the people that start familys and can't afford the big houses from the start and instead they can buy/rent an apartment from on of these huge blocks. Knocking down derelict land which is both an eyesore and can be run down, rough areas mean that they can build more cleaner and newer buildings that can house the city. Brownfield sites places that may be infested with toxic waste, building which may need to be cleared may have access to ecxisting water and electricity supplies so the sites would be perfect for apartment and skyscrapers.

3B

In Atlanta, USA, arial extent is occurring demonstrated by the fact that the area of Atlanta has grown by 20,000 km2 in the last 30 years. A key factor is the growing population, this is due to the climate, affordable housing and cheap labour costs. Low labour costs mean that more businesses open here increasing the job opportunity in Atlanta. as the population increases, the city must expand with the construction of new housing and transport routes to accommodate for levels of migration.

Post World War 2, subsidised housing by the government allowed rich white people to relocate to the suburbs. In the 1960's anti-discrimination laws were introduced which meant the middle-class blacks could leave the inner city as they could afford to commute from the suburbs along with the rich white populations. This meant that the inner city became deprived and businesses were forced to move to the suburbs. As the amount of businesses in the suburbs increased, the job opportunity also increased, meaning the poorer people from the inner city may move to the suburbs. Wanting to live in quiet, open areas, the rich white population would not want to live amongst the deprived black population, and would therefore would move further out from the inner city as they could afford the luxury of cars and Public Transport. This meant that the city began to grow combined with the increasing population.

In conclusion, the main factor which causes cities to grow is the increasing population.

3C

One of the reason is due to a change in lifestyle of people. More and more workers are planning to have families later in life, this means that the construction of small flats and one-bedroomed houses will increase due to increase demand. Fig 8 shows that one-person households is estimated to increase by 159,000 per year, and by 2033 19% of households in England are estimated to be to be for single person compared to 14% in 2008. The improvement of healthcare and decrease birth rate of England has resulted in an ageing population which means that a large proportion of households will be owned by old age people. Fig 3 shows that 33% of households will be owned by people aged 65 or over, by 2033.

The increasing job opportunities in an area is also causing cities to grow. An example of this is in Paris, where the increasing frequency of migrant workers living in poor living conditions in the centre has prompted the government to extend the city by building more homes on the outskirts. Tourism has also influenced this as a greenbelt

is being implemented to improve the city aesthetically. Northstowe is another example which is shown in Fig. 11. This is due to the increase number of people working in universities and science parks. Phase 1 of construction has started in 2015 where 1500 new homes, school and golf course is being built. The construction of the new town will congest A14 even more so the council are planning to link Cambridge Guided Busway into the new town.

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Answer **all** *questions.*

SECTION A

In this section you may use information from the **Resource Folder** *and your own research.*

0 4 'Allowing cities to expand conflicts with maintaining sustainable food supplies.'
To what extent is this true? [25]
(approximately 33 minutes)

4A

Allowing city expansion does conflict with maintaining food supply as city's can only expand if they don't have a greenbelt, so the local farmland surrounding a lot of cities isn't protected. These areas are known as greenfield sites, which are agricultural land, and city expansion takes up these areas, so it is no longer agricultural land. The development on Greenfield sites can sometimes result in the farmers becoming bankrupt and decreases food production in that area, which may mean more food would have to be imported, which is more expensive. In Cambridge there are a variety of different soils surrounding the area, such as high in nutrients, lime content and a good agriculture quality which would help promote food production. However Cambridge has a green belt, so these soils cant be developed on, but most cities don't have that inplace to stop developing on these high quality soils. This would negatively affect food production as the farmers may have to relocate to somewhere the soil isn't as beneficial to the crops, decreasing their yield. Allowing cities to expand also increases the number of people who may move to the city, due to more houses being available, which may mean that the farms cant meet the demand. This may result in more food being imported which isn't economically or environmentally sustainable as it costs more to do and increases CO2 emissions due to the transportation of the products. The demand for food is also likely to increase the level of waste if cities expand, due to people not eating it before it goes off or producing/providing too much food. Fresh fruit, vegetables and bakery products are most of the foods which get wasted, increasing the need for landfill sites and rubbish disposal.

I agree with the statement as it decreases the likelihood of food being sustainable due to the increase in demand and development on greenfield sites.

4B

Urbanisation is happening in almost all countries leading to the need for the city capacity to increase. However, options for dealing with this all have their own impacts. One way of expanding a city is to build on greenfield sites, for example the relocation of Aviva's offices outside of Norwich. This has also been taking place outside of Cambridge, for example the plans to build a new town, Northstowe. This can present conflicts with creating food supplies, as valuable agricultural land is built on. This is particularly a problem in Cambridge and the surrounding areas, where the soils have agricultural qualities ranging from good to very high. The proposed new town, Northstowe, would be partially built on farmland, reducing the space available to farm, although not all of Northstowe would be built on greenfield land. Whilst this does present a localised conflict between city expansion and food production, there is plenty of land available elsewhere which could be utilised for agriculture. With the growth in methods such as GM crops and hydroponics, the amount of land needed may decrease, leaving land around Cambridge and other cities available for urban expansion. Alternative food could be imported from outside the UK, although this is highly unsustainable. Obtaining beans from Kenya or Egyptian potatoes requires flying the food to the UK, which has a huge environmental impact, drastically reducing environmental sustainability.

An alternative to allowing city expansion that doesn't conflict with food supply is to not allow the growth of cities onto greenfield sites. This has happened in Portland, America, where there is a boundary at the existing city limits where building cannot take place. This has been highly successful in preserving agricultural land, which has been valued as contributing $500 million dollars to the economy enhancing economic sustainability and environmental sustainability simultaneously. Furthermore, family farming businesses have been kept farming ensuring people's livelihoods are preserved, an aspect of both economic and social sustainability. However, containment of the city has led to some problems. Portland has over 15 000 incomers each year,

and while it has been successful in keeping them inside city boundaries, this has resulted in the rise of house prices, up 400% in as little as 8 years. Whilst this enhances the economy and is good for economic sustainability, it has a higher, detrimental impact on social sustainability. Many people have been forced out of their homes as they can no longer pay rent on their houses. There is a problem of the 'hidden homeless' - people who have been forced to leave their own homes and must stay with a friend or relatives, meaning that they are vulnerable people, reducing social sustainability. Furthermore, as the population is so highly concentrated, traffic congestion is bad, suggested to be as bad as New York City's. Vehicles spending more time on the road results in higher carbon emissions, contributing to climate change and reducing environmental sustainability. Economic and social sustainability are also negatively affected as workers have no choice but to wait in the traffic wasting their own time and also money in terms of evening time and petrol. Builders are also discouraged from building on brownfield sites as there is an added cost for removing previous structures and paying for things such as surveys, making it expensive reducing economic sustainability.
In conclusion, whilst some methods of expanding a city such as building on greenfield sites does present a conflict with sustainable food supplies, there are methods such as containment or renovation which avoid this conflict entirely. However, in the future, building on greenfield sites may be unavoidable as the population grows.

4C
Cities are growing all around the U.K. because of population growth, demand for business and jobs. Food production in the U.K. is becoming more advanced and more sustainable, because of better technology and a richer more economicall country. Instead of cities like birmingham needing to expand it is seen the oppertunity to redevelop on Brown sites, which reuses land. For example in Birmingham's city centre the have redeveloped industrial land into high rise buildings and attractions such as Sealife Centre and the NIC. This area is now named brindly place, this has attracted young proffesionals and couples to reside here. This is an extent of the city in which hasent crept into the green belt area.

Sometimes the need to expand leads to expanding into green sites and creating new towns such as Telford North west of Birmingham or creating space for universities, hospitals and businesses like on the edge of Norwich. These green fields sites take up agricultural land and also leads to the production of roads for transport such as the A47. This could affect the production of food because of farms being taken up by businesses.

With more methods of farming and better technology more sustainable farming can be produced with fewer space. Ising satelite navagation tractors and combine harvisters sow and collect food produced on farms. These machines can be more sustainable with space. With modified crops also a smaller more seeded wheat for example can be produced as well as controlled farming of animals and using different techniques for growing plants in smaller species like greenhouses at 'thanet earth' by hanging the plants in the air not soil of fertilisers are needed making it more sustainable for space used.

In conclusion cities expanding can affect agriculture like in the outskirts of Norwich but with technology food is now being sustainably grown in different all year round conditions its just wether the public are agreement on these methods or wether growth can be controlled.

4D

Well for cities to keep on expanding we use either brownfield sites or greenfield sights. Using brownfield sites is not a problem as these have been previously built on it just takes more time to clear up the mess that had been previously left there. Whereas greenfield sites are were there has been no previous buildings and are normally agricultural land so if your building on these sights it means that food production will be hindered in that particular area. It also means that people will move to this area that previous would buy food from other areas which will lower the demand in one area and boost it in the other which means that more food may go out of date. In places like India the expansion of one area would cause caos as if the infrastructure is better in that area then food suplies would be delivered but would mean a different area that already doesn't receive enough food to suffer even more.

But if our cities and towns keep on expanding and expanding then sooner than later there will be no room left for farming and therefore would have to import a lot more food than we already do and would have to rely on other countries instead of being the quite sustainable country we are today.

As well as this when big developments are being built, when you open a shop or supermarket near it, when will all the houses be full what if these shops or supermarkets have too much food than what there are customers, and that food that would go out of date that isn't sustainable. Expanding too quickly would lead to huge problems as we see in Atlanta where in some areas you have to drive 30 mins just to get your local shops, which if everyone has to do that then it has huge effects on global warming which is another thing that may either hinder food production or allow food production to grow.

4A

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An alternative to allowing city expansion that doesn't conflict with food supply is to not allow the growth of cities onto greenfield sites. This has happened in Portland, America, where there is a boundary at the existing city limits where building cannot take place. This has been highly successful in preserving agricultural land, which has been valued as contributing $500 million dollars to the economy enhancing economic sustainability and environmental sustainability simultaneously. Furthermore, family farming businesses have been kept farming ensuring people's livelihoods are preserved, an aspect of both economic and social sustainability. However, containment of the city has led to some problems. Portland has over 15 000 incomers each year,

and while it has been successful in keeping them inside city boundaries, this has resulted in the rise of house prices, up 400% in as little as 8 years. Whilst this enhances the economy and is good for economic sustainability, it has a higher, detrimental impact on social sustainability. Many people have been forced out of their homes as they can no longer pay rent on their houses. There is a problem of the 'hidden homeless' - people who have been forced to leave their own homes and must stay with a friend or relatives, meaning that they are vulnerable people, reducing social sustainability. Furthermore, as the population is so highly concentrated, traffic congestion is bad, suggested to be as bad as New York City's. Vehicles spending more time on the road results in higher carbon emissions, contributing to climate change and reducing environmental sustainability. Economic and social sustainability are also negatively affected as workers have no choice but to wait in the traffic wasting their own time and also money in terms of evening time and petrol. Builders are also discouraged from building on brownfield sites as there is an added cost for removing previous structures and paying for things such as surveys, making it expensive reducing economic sustainability.
In conclusion, whilst some methods of expanding a city such as building on greenfield sites does present a conflict with sustainable food supplies, there are methods such as containment or renovation which avoid this conflict entirely. However, in the future, building on greenfield sites may be unavoidable as the population grows.

4C
Cities are growing all around the U.K. because of population growth, demand for business and jobs. Food production in the U.K. is becoming more advanced and more sustainable, because of better technology and a richer more economicall country. Instead of cities like birmingham needing to expand it is seen the oppertunity to redevelop on Brown sites, which reuses land. For example in Birmingham's city centre the have redeveloped industrial land into high rise buildings and attractions such as Sealife Centre and the NIC. This area is now named brindly place, this has attracted young proffesionals and couples to reside here. This is an extent of the city in which hasent crept into the green belt area.

Sometimes the need to expand leads to expanding into green sites and creating new towns such as Telford North west of Birmingham or creating space for universities, hospitals and businesses like on the edge of Norwich. These green fields sites take up agricultural land and also leads to the production of roads for transport such as the A47. This could affect the production of food because of farms being taken up by businesses.

With more methods of farming and better technology more sustainable farming can be produced with fewer space. Ising satelite navagation tractors and combine harvisters sow and collect food produced on farms. These machines can be more sustainable with space. With modified crops also a smaller more seeded wheat for example can be produced as well as controlled farming of animals and using different techniques for growing plants in smaller species like greenhouses at 'thanet earth' by hanging the plants in the air not soil of fertilisers are needed making it more sustainable for space used.

In conclusion cities expanding can affect agriculture like in the outskirts of Norwich but with technology food is now being sustainably grown in different all year round conditions its just wether the public are agreement on these methods or wether growth can be controlled.

4D

Well for cities to keep on expanding we use either brownfield sites or greenfield sights. Using brownfield sites is not a problem as these have been previously built on it just takes more time to clear up the mess that had been previously left there. Whereas greenfield sites are were there has been no previous buildings and are normally agricultural land so if your building on these sights it means that food production will be hindered in that particular area. It also means that people will move to this area that previous would buy food from other areas which will lower the demand in one area and boost it in the other which means that more food may go out of date. In places like India the expansion of one area would cause caos as if the infrastructure is better in that area then food suplies would be delivered but would mean a different area that already doesn't receive enough food to suffer even more.

But if our cities and towns keep on expanding and expanding then sooner than later there will be no room left for farming and therefore would have to import a lot more food than we already do and would have to rely on other countries instead of being the quite sustainable country we are today.

As well as this when big developments are being built, when you open a shop or supermarket near it, when will all the houses be full what if these shops or supermarkets have too much food than what there are customers, and that food that would go out of date that isn't sustainable. Expanding too quickly would lead to huge problems as we see in Atlanta where in some areas you have to drive 30 mins just to get your local shops, which if everyone has to do that then it has huge effects on global warming which is another thing that may either hinder food production or allow food production to grow.

Answer **all** *questions.*

SECTION B

In this section you may use information from any of your studies for AS and A2 Geography as well as from the Resource Folder and your own research.

0 5 Describe some of the problems associated with supplying energy.
How far can managing energy demand sustainably help overcome problems of energy supply? [25]
(approximately 33 minutes)

5A
The demand for energy has been increasing due to rapid population growth in places such as India, population has quadrupled since independence. This is due to growing rich middle class, that put strains on manufacturers to produce more products, thus using more energy, but also more individuals invest in more luxury items, such as air conditioning, which puts a strain on energy demand. Economic growth has increased demand. Since independence, India GDP has been growing by 8% each year. This is due to the fact that more industry is moving to India, as they provide a cheap workforce. However, in the UK energy demand has dwindled since the 1970s.

An example is coal, this is economically sustainable as it is cheap to extract and socially sustainable as it is widely available - 600 years worth stored in the ground. However, it is not environmentally friendly, as it produces carbon dioxide, which contributes to the greenhouse effect. Also, it emits sulfur dioxide which can cause acid rain, increasing the acidity levels of lakes and rivers, which is not enhancing on preserving environments, but risking native wildlife. It's also socially unsustainable, as coal mines can be eysores and cause huge damage to the natural environment. Also, socially, living in close proximity of burning fossil fuel can be highly dangerous, e.g, many workers in Jharkhand, Jhanu coal field, many workers suffer from respiratory diseases such as Bronchitis, as sulfur dioxide reaches their lungs. Many of these individuals are informal employees, so will not be given any medicine or a sick pay, meaning they will most likely to work again and provide for their family, which is significantly unsustainable. Coal is currently India biggest energy of 42%, while less significant for the UK 15%.

Gas makes up 40% of UK's energy supply and 7% of India's. Gas is socially sustainable as it is useful to run transport vehicles, such as trains, cars etc and useful to heat homes. Gas can be seen as environmentally friendly, as emits 45% less carbon dioxide and methane, compared with any other unrenewable energy. However, it is economically unsustainable, as it is expensive due to its limited supply. Socially it can be seen as unsustainable as countries are reliant on others to supply energy: e.g. : Ukraine relies on Russia. However, political issues, can mean this supply can be used as a weapon against other countries.

Although, these supplies have some positive aspects of sustainability, they are still mostly environmentally sustainable, which is the main issue that threatens the sustainability of the planet, as our future looks dim, due to global warming., therefore, I believe more renewable energy sources should reinvested in. Energy saving appliances, such as energy saving lightbulbs, LED TV's instead of flat screens and electric cars instead of petrol cars, would cut emissions, however, these changes would only minorly contribute to decreasing demand.

An example of renewable energy is Tide energy/wave energy e.g: Tidal Lagoon in Swansea. It uses the energy from the sea to power 120,000 homes for 120 years. It has a generator capacity of 240 MW. It is therefore socially sustainable and environmentally sustainable as it generates no harmful gases that contribute to the greenhouse effect. It can be viewed a little economically unsustainable, as the plant cost £850 million. However, it is socially sustainable, as 86% of residents invested and supported the scheme; which involves community spirit and participation which will mean the scheme will last longer. Also, environmentally sustainable, as it can be used as a flood protection for wales (North), prone to severe flooding; this is a balanced use of resources.

However, I think it is most important to educate residents about they're energy use and what harm it does to the planet, with awareness energy demand will be decreased and the need for a energy supply that is sustainable decrease. More schemes such as ('Act

on CO2') and 'Fossil Free". Act on CO2 promotional advert, showed the devastation of global warming through a child book, highlighting the unstableness of our child's future. Emotive adverts like these may decrease demand and alleviate the demand for sustainable energy.

The government has contributed £8 million in order for smart meters to be implemented in people homes by 2020. It allows residents to see how much energy they're using, with awareness they should decrease consumption, however these are economically unsustainable, as they are costly and are estimated only to decrease annual spend by £28. Also, socially unsustainable, as they are not prominent or efficient enough to alert residents attention of their energy use; many are prone to malfunction.

Treaties such as Kyoto Protocol, was implented to suggest that 198 countries by 2009, would cut emissions by 5.2%. However, this is not enough to drastically decrease demand and created a carbon market, where carbon credits could be exchanged in order to cut how much they have to reduce emissions and also to disguise increase in emissions. Socially, it is not sustainable as it was liable to corruption.

Biomass could be more widely used, such as in India, Himalayas: cow dung/slurry is placed into a anorobic digester, it thus produces energy methane, which can be burned.

In conclusion, I believe governments need to put more investment within educating and promoting awareness of our energy use, but most importantly further investments needs to contributed to renewable energy schemes, such as Tidal Lagoon in Swansea. In order for Biomass to be more popular in the UK, investment must be implemented, to increase energy source.

5B

Sustainability in the energy sector is particularly hard to achieve due to the large demand on an international level. This is associated with large scale development and industrialisation, particularly in developing countries.

For example, in India and China the burning of coal has greatly expanded their prospective economies - leading to China becoming the second largest economy by national GDP.

One of the most notable cases with supplying energy in recent times has been the International Geopolitics in Russia. This mostly revolves around the recent conflict in Ukraine whereby Russia hoped to expand it's territory into Crimea. This led to international condemnation of Russia's actions and the threat of sanctions against Russia by other European powers. However due to the dependence on Russian oil particularly in Eastern and Western Europe, sanctions have not been successful as Russia could simply stop supplying energy to these countries.

Also the prospective independence of Scotland from the UK has threatened energy supplies in England, Wales and Northern Ireland as Scotland has plentiful oil and gas reserves in the North Sea.

There are also environmental issues with energy supply. The burning of fossil fuels - particularly in developing countries where they burn coal has threatened the natural environment. China is such an example. Industrial pollution is worst in the large metropolitan areas of Beijing, Shanghai and Chengdu. It can cause acid rain, where CO2 dissolves in rain water to make carbonic acid and can cause respiratory illness such as asthma, emphysema and lung scaring. Acid rain can also destroy crops and threaten water sources therefore negatively affecting the health of residents.

One way in which energy demand can be managed sustainably is through public awareness for example the Act on CO2 campaign in the UK in 2007. It reached a wide audience and helped raise awareness of the environmental consequences of energy demand and use of fossil fuels. However it was seen as patronising to adults and some of the images scared young children, which caused many people to be turned off by it, so it was not completely successful. Another way to manage energy demand was Smart Meters which are installed in all new homes in the UK and give people a financial incentive to stop using energy by showing how much money they're spending. Another way demand can be managed is to build sustainable buildings such as the Geography and Environmental Science building at Shrewsbury Sixth Form College. This uses a variety of measures to reduce demand such as triple glazed windows, windows to maximise light and heat and a specially designed shape so that air could circulate and heating would be inexpensive - this helped the building to be as passive as possible, however it is still heated by a gas boiler and so it is unsustainable as that is a fossil fuel.
Overall I would say that the measures do little to reduce demand and increase sustainability. The CO2 campaign was largely unsuccessful do to it's delivery and the expectation that all new houses will be built as passive as possible is unrealistic. The Smart Meters

5C
The major problem at the moment to do with energy supply is the growing population. Supplying energy is therefore a lot more difficult as the demand for energy is increasing and so in the future energy supply like coal, oil and gas will run out. There is no limit on the supply of energy and so people receive their energy unfairly in comparison to poorer people. One supply of energy is wind energy. The only problem with this is that in the UK, sometimes wind is not enough to generate wind farms as wind turbines so not enough electricity is produced. In some countries, they don't receive enough energy and so wars can come about regarding oil, coal etc. Finally, global warming can be influenced as deforestation is on the rise due to the greater demand for the supply of energy such as wood. In India, Uttar Pradesh Himalaya, deforestation is lower scale.

A way of managing demand for fuel such as wood in India is the use of biogas digesters. This a local project whereby the digester is stored underground and human waste and animal waste is put into the digester. The waste in the anaerobic digester produces methane which is the used as cooking fuel meaning there is less reliance on fuel wood or coal.

Wind farms can be sustainable in managing energy demand. A negative is that economically, they are expensive to initialy construct and wind turbines are not aesthetically pleasing. However, they are sustainable in that electricity is generated providing heat for homes. Wind farms is also good in that wind is a free source of energy.

Smart metres are a way of making people reduce there demand for energy and therefore reduce supply. In the UK, the UK housing stock uses up a lot of energy due to the age and type of housing. Old housing uses large amounts of heat energy. Smart metres are a visual display which informs households how much energy they are using. If they are thus educated put on a CO2 campaign, then this will make them want to reduce the amount of energy they use and therefore will reduce energy demand. Passive houses are another way to manage energy demand when houses are designed especially to help reduce supply > double glazed windows.

In conclusion, it is difficult to manage energy demand as not everyone will reduce it even though it is projected that every household will have a smal meter. Cars and other technologies have led to increases in supply of energy and this is likely to continue with obesity rates increasing in the UK, suggesting not enough people are walking/cycling, instead using their cars to get around. For now energy supply methods are working but it will take a long time before energy supply is reduced due to demand.

5D
use less energy increases the supply

The demand for energy is increasing and so is the population. This is putting pressure on energy supplies because there is a bigger demand for electricity, so there needs to be a bigger supply of energy, and this is a problem because fossil fuels are running out and new ways of creating electricity are very expensive. An example of this is in the North Sea where 10 years ago it produced all of the UK gas now most of it is imported from other countries.
Another problem with supplying energy is where to get it from because fossil fuels are running out, and more greener energy is being used which is good however many people dislike some ways of generating green energy. For example wind turbines are a useful way of generating electricity, but many people don't like them due to noise produced and the size of turbines. Also many new ways of electricity cost huge amounts of money such as the tidal lagoon in Swansea which is estimated to cost over 500 million pounds.
Managing energy can help with problems of energy supply because if less energy is used this reduces the demand for energy. If people used less energy this would help overcome problems of energy supplies. One way to do this is to create your own electricity which can be done by using solar panels on a house or small wind turbines. These methods are good because electricity produced by solar panels can be sold back to the electricity grid and also used to power your own home. Many people have started to install solar panels on their houses.
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