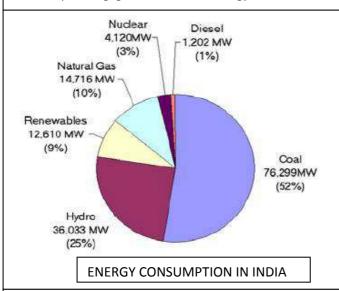
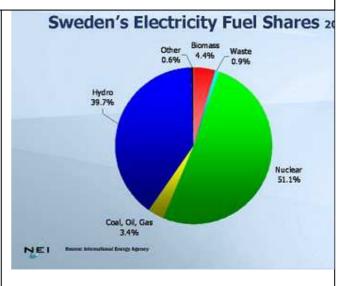
ENERGY MIX

The energy mix for a country depends on :-

- 1. The resources available in the country in terms of coalfields, oil fields etc. This cuts down on more expensive imports
- 2. Some countries are better endowed with the possibilities for renewable energy; they sit near a plate boundary for geothermal energy or are in a very sunny or windy area, or have heavy rainfall and steep mountainous area that make HEP possible
- 3. A country may opt to develop its own resources rather than depend on the import of energy such as oil from the unstable Middle East, this gives a country greater energy security
- 4. Low levels of development may mean that LEDC countries still depend on traditional economies and fuel sources such as fuelwood. MEDC countries may have the technology in their industrial and post industrial societies to develop advanced energy production means such as nuclear and some of the renewables
- 5. Most countries have now signed up to agreements to limit carbon emissions and are trying to move to less polluting 'green' sources of energy





INDIA

- 34% of India's total energy is supplied by coal, 22% by oil and 4% by gas. That makes 60% by fossil fuels which makes it very difficult for India's expanding economy to address it rising carbon emissions
- India has vast reserves of coal but very limited oil and gas and therefore depends heavily on imports from the Middle Fast
- Only a very small percentage of the energy needs come from nuclear, HEP and other renewables but India has
 plans to expand in these areas, particularly in the north where the steep slopes and heavy precipitation make
 HEP production possible
- In Urban areas industry, transport and homes are heavy users of imported oil, but in rural areas, which are responsible for consuming 60% of the energy, biomass (wood, crop residues, dung) are traditionally used for heating, cooking and lighting
- Unsustainable exploitation of woodlands has, however, led to soil degradation and soil erosion

SWEDEN

- At present 46% of the electricity needs are generated by nuclear power stations, and 52% by HEP, leaving only 2% by fossil fuels (coal oil and gas)
- Sweden has few reserves of fossil fuels and relies on imports from Norway and Russia to cater for some of its heating and transport needs
- Sweden has a low carbon emissions policy and is promoting renewable such as biomass through the use of biofuels which now fulfils over 60% of district heating needs
- The 10 nuclear power plants are found in the populated south of the country and all are located on and cooled by lakes and rivers or are on the coast
- At present the Government intends to reduce Sweden's reliance on nuclear power due to worries about radiation and health problems, however, public opinion is still in favour of nuclear power, or at least it was in the pre-Fukushima period
- HEP is mostly produced in the highlands to the north, where physical conditions are favourable; higher rainfall, spring snow and ice melt, steep slopes and waterfalls, high energy and high discharge rivers and natural lakes for storage
- Both nuclear power and HEP give Sweden greater energy security and less reliance on imports

POLITICAL

- non renewable resource
- rise does not address world initiatives and climate change protocols (eg Kyoto)
- but seen as cleaner and less polluting than coal or oil
- some dependence on foreign imports and trade

PHYSICAL

- North Sea oil and gas finds in the 1970's
- carbon dioxide emissions, climate change
- cleaner than oil or coal

NATURAL GAS

- *changing use in the UK
- *1960's to present day
- *large rise from nothing to around 40%

ECONOMIC

- still large reserves available in the North Sea fields
- remaining fields are smaller / less economic, more isolated. May reduce in near future
- easy and cheap to transport

POLITICAL

- increase addresses global warming and climate change
- gives a greater spread of energy sources, reduces reliance on fossil fuels
- health risks causes political uncertainty
- present policy sees expansion to concentrate on home energy supplies

PHYSICAL

- reduces carbon dioxide emissions and climate change
- leaks and radioactive scares and links to cancers eg Chernobyl and Fukushima disasters

NUCLEAR

- *changing use in the UK
- *1960's to present day
- *rise to around 15% then remaining steady

ECONOMIC

- was seen as a very cheap source of energy in the 60's
- uses very small quantities of raw materials
- cost of de-commission is high
- high cost of storage and disposal of nuclear waste

POLITICAL

- renewable / green energy source
- would help UK follow world initiatives and climate change protocols
- opposed by NIMBY's and environmentalists protecting national parks

HYDRO ELECTRIC

- *changing use in the UK
- *1960's to present day
- *remains steady at a very low %

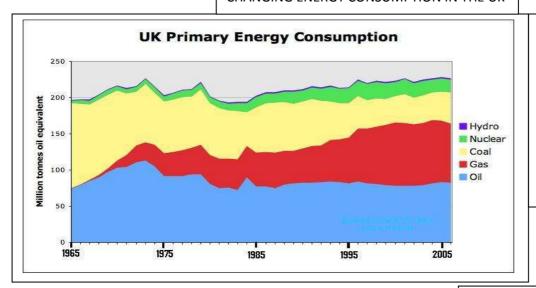
ECONOMIC

- very expensive to build
- good sites are isolated from population centres, expensive to transport electricity
- good as a spinning reserve. Able to cope with peak demand and rapid changes in demand

PHYSICAL

- very few good sites found in the UK
- environmentally negative; impact on National Parks and mountainous areas
- grid of transmission lines affects scenic value of areas

CHANGING ENERGY CONSUMPTION IN THE UK



- → COAL
- PETROLEUM / OIL
- → NATURAL GAS
- NUCLEAR
- → HEP

POLITICAL

- reduction addresses global warming and climate change
- seen to follow world initiatives and climate change protocols (eg kyoto)
- reduced strength of miners union
- gives a greater spread of energy sources / energy mix

PHYSICAL

- carbon dioxide emissions cause climate change
- environmentally negative; pollution, smoke, noise etc.

COAL

- *changing use in the UK
- *1960's to present day
- *large fall from over 50% to around 20%

POLITICAL

- reduction addresses global warming and climate change
- seen to follow world initiatives and climate change protocols (eg kyoto)
- reduces dependence on imports especially from politically unstable parts of the world like the middle east

ECONOMIC

- coal is difficult and expensive to mine
- easier surface / open cast coal is exhausted
- coal is expensive to transport

OIL / PETROLEUM

- *changing use in the uk
- *1960's to present day
- *rise to 50% by the 70's then slight fall to 40%

PHYSICAL

- north sea oil finds in the 1970's
- carbon dioxide emissions, climate change
- pipeline leaks, environmental damage

ECONOMIC

- easier cheaper oil and large fields are exhausted
- remaining fields are smaller / less economic, more isolated
- oil is easier and cheaper to transport than coal

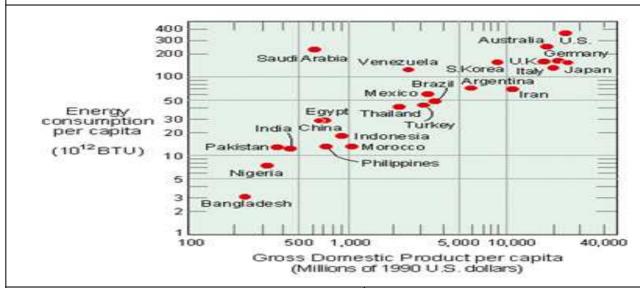
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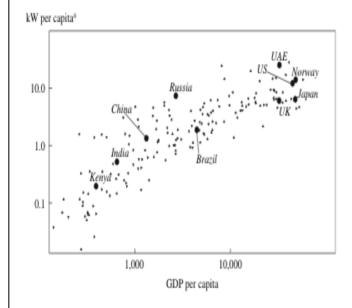
GEOGRAPHY

CASE STUDY REVISION BOOKLET

THE ENERGY MIX OF A COUNTRY: LEVELS OF DEVELOPMENT AND ENERGY USE

INDIA SWEDEN UK





The more developed a country is the more energy it uses. This is a positive relationship and works well for most countries

These two graphs show levels of development measured in Gross Domestic Product per capita, which is a measure of all the wealth generated by a country in a given year divided by the population of that country to take the differing sizes of countries into account

Energy is shown as kW per capita which is the Kilowatts produced per person and BTU which stands for British Thermal Unit a more traditional unit of energy

Developed countries use more energy because :-

- They have a greater level of urbanisation and people living in towns and cities use more energy
- They have a greater level of industrialisation using energy in manufacturing industries
- They have a more mechanised and intensive system of agriculture
- They have a larger service sector, consuming more energy in offices, schools, hospitals etc
- They have systems of transport, road, rail, air that use a great deal more oil
- Domestically their homes have more energy using facilities and appliances, central heating, aircon. Etc

Some countries don't follow this pattern because :-

- They have large reserves of energy resources such as oil which makes it very cheap to use, see Saudi Arabia, Venezuela and UAE on the above graphs
- Some large countries like Russia and Canada use large amounts of energy on transport and have extreme climates that require large energy inputs in winter for heating