



United Kingdom

Case
Study

UK Energy Mix

- **Gas** – 39.93% (0.05% in 1990)
- **Coal** – 33.08% (67.22% in 1990)
- **Nuclear** – 19.26% (18.97% in 1990)
- **Renewables** – 3.55% (0% in 1990)
- **Hydroelectric** – 1.10% (2.55% in 1990)
- **Imports** – 1.96% (3.85% in 1990)
- **Oil** – 1.12% (6.82% in 1990)

Targets

- The UK low carbon transition plan (transition to low carbon economy- cutting carbon emissions by 22% by 2012)
- Targets for electricity from renewable sources 10% by 2010, 20% 2020, in comparison to 4.5% in 2009
- The Scottish Executive has a target of generating 17% to 18% of Scotland's electricity from renewables by 2010, rising to 40% by 2020
- Householders are encouraged in making their homes energy efficient

Wind turbines

- Government providing 160million to help offshore technology rather than onshore, as the negative impacts are thought to be less severe



Advantages

- Plenty of it (exposed to it, UK has best wind resource in Europe)
- Renewable (it will not run out, it is a non-critical source)
- Widely distributed (wind is widely spread all over the country)
- Cheap (once the turbines are built, wind blows for free, cost has fallen by 80%)
- Clean (no carbon dioxide, sulphur dioxide)
- Saves land (turbines are tall and not interfere with land use beneath, e.g. agriculture)
- Provides energy mix (one way of diversifying energy, government can't be held to ransom by one set of energy workers, reduces dependence on imported)
- Ideal for local needs
- Matches up with demand (most wind and demand in winter)

Disadvantages

- Number of turbines (2300 turbines to generate power of one coal-fired power station)
- Noise
- Location (often away from where energy is used, big expense for transmission)
- Visual impact
- Wind doesn't blow all the time
- Windspeed is changing (too low, or too fast so damage occurs)
- Non-dispatchable (can't change output according to increasing or decreasing demand)
- Wind farms confuse radars

Reasons for concerns

- A big worry is that existing nuclear plants will have to stay running for longer than is safe, which has unknown consequences.
- Unless the UK makes concrete plans for tackling a shortage of power stations, national energy security ought to take a priority over the targets that say UK emissions must be reduced by 80pc from 1990 levels by 2050.
- It was revealed that the government figures suggest that there will be a 3000 megawatt hour shortage of supply by 2017 causing 1970 style blackouts.
- Over the next 10 years, one-third of Britain's power generating capacity needs to be replaced with cleaner fuels because of European laws of pollution.
- By 2025, the situation should worsen with a shortfall hitting 7000 megawatts hour per year- the equivalent to an hour-long power cut for half of Britain

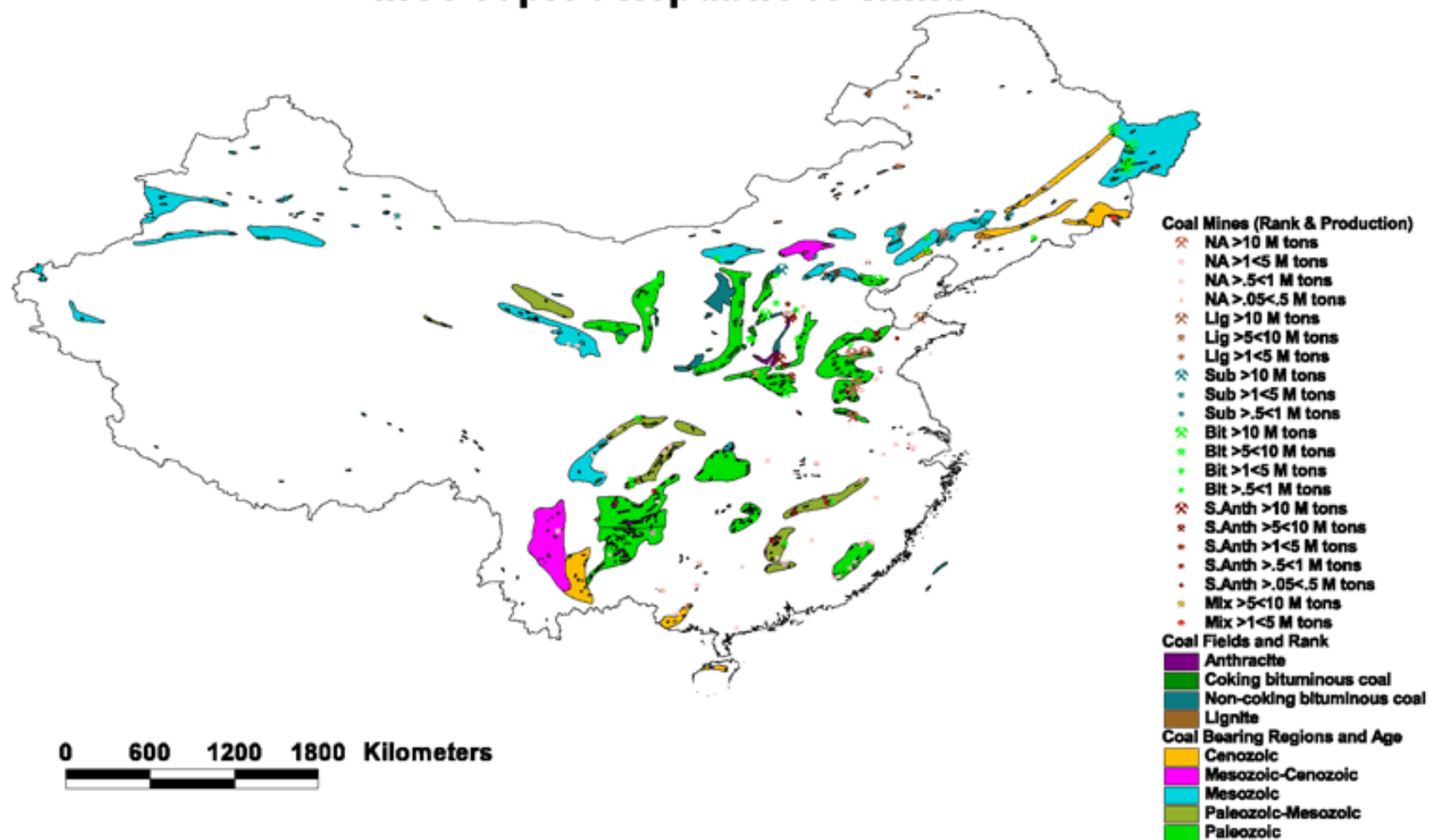
Solutions

- If demands are to be met, energy companies and investors should be convinced to build thousands of wind turbines, at least 3 nuclear power plants and a raft of cheaper gas stations. However there are problems with this due to the market and the recession.

CHINA

By: SY, SW, Juto, Simon, (Mario)

Figure 1. Coal Mines, Coal Fields, and Coal-Bearing Age Units in the People's Republic of China



Coal in China

China is the last great coal economy

- Produced 1.2 billion tonnes
- The work force exceeds 5 million people
- Internal demand is large therefore little exports
- 71% energy consumption
- 3,050 million tonnes

Social Impacts

- 80% of world's coal mining fatality
- Create jobs
- Tunnels, sometimes damaging infrastructure
Rendering land unfit for the other uses

Economic Impacts

- Tunnels, sometimes damaging infrastructure
- 7th largest exporter of coal (38.4 million tons exported)
- Increase in AD (more money for government spending on other things, reduced opportunity costs)

Environmental Impact

- Release of carbon dioxide and methane
- Waste products including uranium, thorium, and other radioactive and heavy metal contaminants
- Acid rain
- Acid mine drainage (AMD)
- Interference with groundwater and water table levels
- Impact of water use on flows of rivers and consequential impact on other land-uses
- Dust nuisance
- Rendering land unfit for the other uses





HEP in China – The Three Gorges Dam

The facts

- Over 2km long and 100m high
- Planned to be over 600km long
- 22,500 MW
- £ 13 billion spent
- The Yangtze provides 66% of China's rice and contains 400 million people
- The Yangtze drains 1.8 million km² & discharges 700 km³ of water annually
- Only ¼ of potential HEP is being used
- 7.5% of total energy production 15% by 2020

Social impacts

- 1.3 million people displaced + 300,000 to be displaced
- Resettlement land is over 800m above sea level. Colder, steep slopes, infertile thin soils
- Archaeological treasures will be drowned including the Zhang Fei temple
- Contaminated drinking water with nitrates and phosphates for 50,000 ppl
- Farmers are complaining

Economic Impacts

- Reduce dependency on coal
- Supply energy to Shanghai
- Allows shipping above the Three Gorges
- Provides jobs
- Investment contributed to AD.
- Invested government + private. Share prices increased by 45% as the company raised nearly \$1.2 billion PER DAY

Environmental

- Floods
- Interfere with aquatic life – Siberian Crane and the White Flag Dolphin are threatened with extinction
- Risk of earthquakes induced by pressure from rising water
- Soil erosion, deforestation □ Ecosystem destroyed

Reasons

- Social: Great population momentum also increasing demand (energy consumption per capita in 2009 it was 34 to 186 with France's)
- Government: Aim to increase the percentage of renewable energy to 15% in 2020
- Resources: The largest producer due to large deposits in the North)
- Economy activity: China is based on primary 43% (of GDP)
- To reserve the deposit of coal (could be selling this to other resource-poor countries in the future)