Future uncertainties of energy supply and demand

**Investigating a range of energy supply and demand, and economic growth projections to develop an awareness of uncertainty**

**The four future energy scenarios:**

**1. Business as usual**

If we do nothing forecasts predict that by 2030:

* Global primary energy demand will rise by 53%
* Fossil fuels will remain the dominant source of energy worldwide
* Emissions from electricity generation will account for 44% of energy-related emissions
* Over 70% increase in the energy demand will come from developing countries due to rapid economic growth and population growth
* In the 1980s, geologists were saying there was only 50 years worth of oil left, yet today this is still the figure quoted

**2. Renewable energy with the emphasis on wind power**

* Costs of generating wind today are about 10% of what they were 20 years ago
* In some areas first generation wind turbines are being replaced with modern turbines which give better performance
* NIMBY – people are concerned that the turbines could blight their homes and views
* Turbines can kill birds
* Suitable areas are often near the coast where land is expensive

**3. A nuclear future:**

a) Uranium is relatively cheap to mine and reserves should last around 150 years. By 2008, 439 nuclear reactors were supplying 15% of the world’s electricity, without producing greenhouse gas emissions

b) Nuclear power plants need much less fuel than fossil fuel power plants and so are less vulnerable to shortages due to international tensions, natural disasters or strikes and pollution from nuclear power plants is minimal. The new breeder reactors are far more fuel-efficient than current reactors

**4. Energy Conservation**

a) Combined Heat and Power (CHP) power stations waste 65% of the heat they generate but CHP plants can be up to 95% efficient as they can use different fuels in the same boiler including biomass but also cut emissions and reduce fuel dependency

b) Green Taxation aimed at cutting the use of natural resources and encouraging recycling. e.g. road tax increase in 2010 will see 9.4 million motorists pay more road tax aimed to punishing heaviest polluting cars. The government will receive more that £1 billion in additional revenue.

**Over to you:**

1. A nuclear future would be the simplest solution to global energy insecurity, what factors limits this as the ideal solution?
2. Fast forward to 2100, what might the energy mix of the USA and the UAE look like? Justify why.

**Definitions:**

**Peak oil –** The year in which the world or an individual oil-producing country reaches its highest level of production, production declines after

**Strategic -** Something that is done as part of a plan that is meant to achieve a particular purpose or to gain an advantage

**Energy scenario –** a range of models used to imagine future energy supply and demand, created to help plan for the future in an uncertain world