



## Supporters of Nuclear Energy

### ENERGY FACTS 2010 - UPDATE

#### WORLD ENERGY USE %

Because of the global recession the growth in world use of energy has slowed – to 1.4% in 2008 when 11,295 million tonnes of oil equivalent were required. This delivered less useful energy because of the losses incurred in converting fossil fuels to heat and light. The share of useful energy delivered was: oil 28%; coal 22%; natural gas 19%; hydro 17%; and nuclear 14%

#### UK ENERGY SOURCES %

The UK now has to import coal, oil, gas and even biomass (wood) and within a decade could become dependent on gas imports for 80-90% of demand. In 2008 Britain used 229mtoe. In terms of the amount of useful energy supplied this was shared by: natural gas 36%; oil 32%, nuclear 16% and coal 14%; renewables 2%.

#### UK ELECTRICITY DEMAND %

UK demand for electricity varies from around 24,000MW in summer to 62,000MW in winter. In 2008 electricity supplied in the UK fell slightly to 400TWh – the amount delivered over the year by power stations –but domestic demand rose 2.4% to 118TWh. The distribution between sectors was domestic 29; industry 28;commerce 19; fuel industries 8; and public administration 6%; transport 2%; agriculture 1%. Losses in transmission accounted for 7%.

#### COMPARATIVE UK ELECTRICITY PRICES

In November 2008 the UK's Energy Minister, gave the following levelised generation costs in £/MWh – nuclear 38, coal 51, gas 52, onshore wind 72; offshore wind 92.

For this year the OECD in Paris projects nuclear being cheaper than coal or gas, its main competitors, in Finland, France, Germany, Switzerland, Netherlands, Czech Republic, Slovakia, Romania and Canada. Nuclear's costs include everything from mining uranium to decommissioning and waste management. Its price includes a 4% charge to cover eventual decommissioning and waste management.

#### SOURCES OF CARBON EMISSIONS

The world pours out 31 billion tonnes of carbon dioxide. Britain accounts for only 2% at 545.6mt a year. British emissions come from power stations 33%, transport 24%, industry 23%, homes 14%, commercial and public services 4%; and agriculture and others 2%.

#### UK CARBON EMISSIONS BY FUEL

Nuclear is the cleanest fuel used in Britain today, emitting next to no carbon. In terms of grams of carbon per unit of electricity (kWh) produced the score is– coal 955 grams; oil 828; diesel 772, gas 430, solar 133, geothermal 79; energy crops 17; hydro 8-9; wind 8; nuclear 4 grams.

In other words nuclear is 200 times cleaner than coal and 100 times cleaner than gas.It is crucial to Britain achieving its vastly ambitious aims of reducing carbon emissions by 34% (on 1990) by 2020 and 80% by 2050.

## **NUCLEAR ACROSS THE WORLD**

Uranium has been used across the world commercially to generate electric power for more than 50 years. Britain led the nuclear field at Calder Hall in Cumbria. There are currently 436 commercial reactors in 30 countries generating 372,000MW (the equivalent of 372 large power stations), 15% of global demand. Some 56 countries operate 250 research reactors and 220 reactors power 150 ships and submarines. By now engineers have more than 13,600 reactor years' experience of their technology. Another 30 reactors are under construction and 90 planned as more countries decide to include nuclear in their generating mix. Uranium is as plentiful as tin in the Earth's crust and there is no foreseeable shortage..

The vast bulk of nuclear generation is in Europe and North America but Asia is developing nuclear power rapidly. The world share is Europe 44%; North America (USA and Canada) 35%; Asia Pacific 20%; South America and Africa 1%.

In 2008 nuclear generation across the world saved the equivalent of 620 million tonnes of oil and avoided about 5bn tonnes of CO<sub>2</sub> emissions.

## **NUCLEAR IN EUROPE**

France generates nearly 80 per cent of its electricity by nuclear means. It has two new ones on the stocks and Finland is building a new nuclear power station. The major nuclear power countries of Europe are: France – 77% of power from nuclear; Belgium 58%, Sweden 45%; Finland 31%; Germany 29% and Spain 27%. In 2008 the UK figure was 16%.

## **NUCLEAR IN THE UK**

The UK has 19 commercial reactors in operation at 10 power stations. Four Magnox – the oldest – remain working along with 14 AGRs, effectively the second generation of British reactors, and one PWR at Sizewell B in Suffolk.

Existing nuclear power station sites, going round the coast N/S are: Dungeness, Sizewell, Hartlepool, Torness, Hunterston, Heysham, Wylfa, Oldbury and Hinckley Point.

The Government has recently identified 10 potential sites for use up to 2025 – all these apart from Torness, Hunterston and Dungeness, plus Bradwell (Essex) where the nuclear power station has closed, and two new sites at Kirkstanton and Braystones on the Cumbria coast.

## **NUCLEAR WASTE**

The nuclear power industry has been handling its waste for 50 years and produces only 0.1% of the UK's toxic waste. In one year a large 1,000MW power station generates only enough to fill a London bus , 90% of which is low level. This can be handled with gloves and is stored at Drigg in Cumbria. The remaining waste – only enough to fill a London taxi – requires treatment. New designs of nuclear reactor will produce only a tenth of that from older generation reactors when decommissioned.

“Spent” fuel – which has been through a reactor's generating cycle – can be recycled. About 96% of the uranium and a little plutonium can be recovered for further use as fuel.

Nuclear power puts little radiation into the atmosphere - only about one thousandth of the dose received each year by the public. Natural sources (radon from the soil and radiation from rocks and sun as well as chemicals in our bodies) are responsible for 85% of the background radiation. Medical X-rays put 140 times more radiation into the environment than nuclear power.

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