



Supporters of Nuclear Energy

ENERGY FACTS 2012

WORLD ENERGY USE %

Global energy consumption grew strongly by 5.6% in 2010 – the latest figures available - to 12bn tonnes of oil equivalent (toe). It was the biggest annual growth since 1973 and took consumption to well beyond its 2008 peak. The contributions were: oil 33.5%; coal 29.5%, natural gas 23.8%; hydroelectricity 6.5%; nuclear 5.2%; and renewables 1.3%. Less useful energy was delivered because of losses in converting fossil fuels to heat and light. The main shares were: oil 28%; coal 23.8%, natural gas 19.2%, hydro 16% and nuclear 13%.

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 2010 we used 227.5mtoe, up 3.4% on 2009. The useful energy supplied came from natural gas 38%; oil 32%, nuclear 14%; coal 13% and renewables 3%.

UK ELECTRICITY DEMAND %

UK electricity demand varies from around 24,000MW in summer to 61,000MW in winter. Its peak was 60,893MW in the middle of a cold spell in December 2010. Electricity generation, including pumped storage, rose 1.2% on 2009 to 381TWh and total supply, including net imports, by 1.1%. It was generated by natural gas (46%); coal (up 1% to 28%); nuclear 16% (down 2% because of maintenance) and renewables marginally up at 6.8%. Households accounted for 31% of total demand; industry 27% and transport and services 27%; fuel industry 7% and losses 7%.

COMPARATIVE UK ELECTRICITY PRICES

The Department of Energy and Climate Change's 2011 projections – i.e. best estimates - are: nuclear £66-74MWh, depending on whether it is the first of its kind or one of a series of power stations; gas CCGT £78MWh; onshore wind 90MWh; advanced supercritical coal with flue gas desulphurisation £95MWh; coal with carbon capture and storage (CCS) £110-136MWh; and offshore wind £135MWh.

Over time a series of international studies has shown nuclear to be highly competitive, taking all costs from mining uranium to decommissioning and waste management into account.

SOURCES OF CARBON EMISSIONS

Man's operations across the world emit 31bn tonnes of carbon dioxide (CO₂) a year. The UK accounts for only 2%, or 545.6mt. Its total emissions of six greenhouse gases covered by the Kyoto Protocol were 582.4 in 2010, up 2.8% on 2009. UK CO₂ emissions in 2010 are estimated to come from electricity supply 39%; transport 25%, residential 17%; and business 16%.

UK CARBON EMISSIONS BY FUEL

Nuclear is the cleanest fuel used in the UK today. It emits next to no CO₂, taking account of uranium mining and decommissioning and waste management. Expressed in terms of grams per unit of electricity (kWh) the score is nuclear 4gm; wind 8; hydro 8-9; energy crops 17; geothermal 79; solar 133; gas 430;

diesel 772; oil 828; and coal 955gpkWh.

Nuclear is 200 and 100 times “cleaner” than coal and gas respectively. It is crucial to achieving the Government’s ambitious carbon reduction emissions targets.

NUCLEAR ACROSS THE WORLD

Britain led the world into the nuclear power age at Calder Hall in Cumbria 55 years ago. Now there are 440 reactors in operation in 30 countries, another 61 are under construction, 156 are planned (for the next 8-10 years) and another 343 proposed longer term. Current total capacity is 377,000MW, roughly equivalent to 370 large power stations. Sixty-one new reactors are under construction in 13 countries – 26 of them in China – and 156 are planned in 27 countries. Of these the leaders are China 51 reactors, India 17 and Russia 14. Longer term another 343 reactors are proposed in 37 countries with the same nations leading the way – China 120, India 40, Russia 30 and USA 27.

The vast bulk of global nuclear generation is still in Europe and North America – Europe 44%; North America (USA and Canada) 34%; Asia Pacific 21%; South America and Africa 1%. In 2010 nuclear generation across the world saved the equivalent of 620m tonnes of oil and 5bn tonnes of CO₂ emissions.

Uranium is as prevalent in the world’s crust as tin and there is no shortage. With recycling of so-called “spent fuel” and the fast reactor, now being revived, it is estimated there is enough nuclear fuel to last for 1,000 years.

NUCLEAR IN EUROPE

Nuclear generates nearly 75% of France’s electricity. It has two new plants on the stocks and Finland one. Apart from France, nuclear is a major generator in Belgium 51%; Sweden and Switzerland 38% each; Germany 29% and Finland 28%.

NUCLEAR IN THE UK

The UK has 19 commercial reactors in operation at ten power stations – two Magnox, seven AGR and one PWR (at Sizewell, Suffolk). Nuclear power station sites (going round the coast anti-clockwise) are Dungeness, Sizewell, Hartlepool, Torness, Hunterston, Heysham, Wylfa, Oldbury and Hinkley Point.

The Government has identified 8 potential sites for use up to 2025 – all the above, apart from Torness, Hunterston and Dungeness, plus Bradwell (Essex) where the power station has closed.

NUCLEAR WASTE

Nuclear power puts into the environment only about one-thousandth of the radiation dose received each year by the public. Some 85% comes from natural background radiation – from the soil, rocks, the sun and chemicals within our bodies. Medical X-rays are responsible for 140 times more radiation in the environment than nuclear power.

The nuclear industry has been handling its waste for 55 years and produces only about one-thousandth of the UK’s annual toxic waste. It comes in three categories: low-level, intermediate and high-level waste. Ninety per cent of it is low level and is disposed of at Drigg in Cumbria. The remaining 10% needs treatment. but the annual amount of high level waste produced by a large nuclear station would only fill a London taxi. New designs of reactor will generate only one-tenth of the amount of the intermediate and high level waste from today’s reactors.

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