



## Supporters of Nuclear Energy

### THE CASE FOR NUCLEAR POWER

- 1 – **Nuclear power is safe:** Not a single death reported from a nuclear accident in the UK in 55 years' operation. In the three major international incidents, at Three Mile Island, USA, the safety system worked and the community was not affected; the Chernobyl (Ukraine) disaster in 1986 has so far cost some 56 lives, according to the UN, though there have been several thousand cases of treatable thyroid cancer; and at Fukushima (Japan) no significant radiation injuries have so far been attributed to the 2011 disaster caused by an unprecedented tsunami following a massive earthquake that separately killed more than 15,800 people. The 40 year-old reactors shut down automatically in the earthquake but the tsunami swept away sources of back-up power for cooling, creating a major emergency that destroyed the reactors.
- 2 – **Nuclear is reliable:** Over the past 55 years nuclear has generated up to 30% of the UK's electricity, though it is only about half that now and falling as ageing nuclear stations are closed. Current plans up to 2025 envisage building reactors to replace 16,000MW of current baseload nuclear capacity, just under a quarter of current peak demand. Nuclear vies with coal as the largest single source of electrical power in Europe.
- 3 – **Nuclear is clean:** On the Government's own figures, nuclear produces the least carbon emissions in power generation, taking everything from mining uranium to decommissioning and waste management into account. It emits half the CO<sub>2</sub> from wind power per unit of output, 100 times less than gas and 200 times less than coal. It is just what the doctor ordered to combat global warming.
- 4 – **Nuclear is economic:** A succession of studies across the world has established nuclear power over the years as the cheapest source of electricity, again taking into account all costs from uranium mining to decommissioning and managing waste. The 2011 projections from the Department of Energy and Climate Change give the following "lifetime" cost estimates: nuclear – £66MWh - £74MWh, depending on whether the station is the first of its kind or one of a series; gas CCGT £78MWh; onshore wind £90MWh; advanced supercritical coal with flue gas desulphurisation £95MWh; coal with carbon capture and storage (CCS) £110 -137MWh; and offshore wind £135MWh.  
New generations of reactor have been designed with decommissioning in mind - unlike the first two generations in use in Britain. They will produce only about 10% of the intermediate and high level waste arising today.
- 5 – **Nuclear has other advantages:** Nuclear is vastly more economical in its use of land than wind or solar. Existing nuclear sites where new stations are to be built are

linked to the National Grid, thereby minimising transmission investment. The nuclear industry also enriches remote communities economically and culturally and puts Britain on the leading edge of high technology. It is seen as a major future employer of highly educated and trained staff.

- 6 – **Nuclear has no problems with its waste:** Britain's nuclear industry has been managing its waste since commercial power operations began in the 1950s. There are three categories – low, intermediate and high-level. More than 90% is only slightly radioactive and goes to a concrete repository in West Cumbria. Intermediate level represents only about six per cent of the total waste volume. It is immobilised in concrete or bitumen in special steel drums to await eventual disposal. The high-level waste – only 4% of the total - is stored to allow the heat to decay and then cast into glass blocks to immobilise it and reduce its volume prior to eventual disposal. Government policy is eventually to dispose of the higher level wastes in a deep repository.
- 7 - **Nuclear has no problems with its fuel:** Uranium is about as prevalent in the world's crust as tin. Supplies are plentiful. Moreover, by reprocessing "spent fuel" from reactors about 96% of the uranium and the small amount of plutonium produced can be recycled as fuel. Reprocessing thus makes available a vast store of cheap power, reduces the amount of waste going for eventual disposal and enables plutonium to be burned up in reactors, thereby minimising proliferation risks. Longer term fast reactors now being revived can get 60 times more energy out of the same quantity of fuel as existing reactors – and minimise waste.
- 8 – **Nuclear has a major fuel price advantage:** While nuclear power stations are more costly to build, they are cheap to run. This is because, unlike coal or gas, nuclear's fuel represents only at most 20% of its costs. Its advantage is thus substantially protected from fuel price escalations – the major cause of the rise in fuel bills.
- 9 – **So where is nuclear's competition?** – While security requires a mix of power sources, nuclear is at worst highly competitive. When the cost of dealing with CO<sub>2</sub> is taken into account, it is out on its own. This explains why countries across the world, and especially in Asia, are building or planning new nuclear plants on top of the 440 already operating internationally. They see nuclear as the future. It is also because renewables – wind, waves, tides, solar, biomass etc – are either dilute, intermittent or unpredictable sources, or all three. Eliminating energy waste and increasing energy efficiency are important, but the potential savings are hard to realise because of the required changes in human behaviour. And it has yet to be proved that CCS to remove CO<sub>2</sub> from gas and coal-fired stations' waste output can be scaled up to lock the CO<sub>2</sub> up for all time in strata under the sea. But even if it can, it could double the price of electricity from fossil-fuelled stations.
- 10 – **So, nuclear is the poor man's friend?** Yes. It is the most reliable, cheapest and "greenest" source of electrical power. It is the best way to combat global warming – and rising fuel poverty. It is a "must".

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