

# The Case Against Nuclear Power

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# Consequences of Radioactive Releases

- The critical issue for nuclear power is the consequences of a major radioactive release
- These were predicted in the Sandia CRAC-2 study of 1982 as 42,000 to 100,000 early deaths

# Consequences of Radioactive Releases

- They were confirmed by Chernobyl in 1986, which contaminated huge areas of the Ukraine, Belarus and Russia as well as 40% of Europe
- The eventual death toll has been put variously at 10,000 up to 1.8 million
- Fukushima has been predicted to cause up to 210,000 excess cancer deaths – so far

# Probability of Radioactive Releases

- The probability of any size of radioactive release is not just unknown but logically unknowable
- So it must be taken as 1 – i.e. inevitable
- 'Logic does not require empirical verification'
  - Nassim Nicholas Taleb (of 'Black Swan' fame)

# Probability of Radioactive Releases

- The inevitability was understood from the start by the worldwide insurance industry, so nuclear is uninsurable and the risk carried by the state
- It was also understood by some involved in nuclear safety studies and some other analysts
- If insurance was available, it alone would add e.g. 45 to 348 p/kWh to the cost of nuclear power

# CO2 Emissions and Costs

- For a uranium ore grade of 0.15%, the emissions of nuclear power plants are 135g CO<sub>2</sub>/kWh
- Uranium would probably reach the energetic 'point of futility' before the end of their lifetime
- The cost of building long term stores for the UK's present nuclear waste has been put at hundreds of billions of Euros

# Rational Energy Policy

- Oil is used for transport, gas and coal for heat and power, but what is electricity used for and how much less could we use for the same function ?
- In the UK, electricity is 20% of energy and nuclear is 20% of electricity = 4% of energy, so what shall we do to replace oil, gas, coal and uranium ?

# Rational Energy Policy

- Germany has shown us the way – turn to energy efficiency and renewables, like the rest of the world
- Angela Merkel opened an offshore wind farm using Siemens wind turbines on May 2
- She announced 5 billion Euros in soft loans to encourage further, faster investment in renewables



# Rational Energy Policy

- On May 13 Audi (VW) and partners announced the 'e-gas' project to produce methane from wind power to store 'months' of electricity & for transport & heat
- The 'e-gas' plant will use well-known technology based on decades of research and development
- Starting in July it will use Siemens wind turbines in the North Sea and cost tens of millions of Euros

# Rational Energy Policy

- Others are adopting safer, sustainable and infinitely cheaper solutions for supplying energy services
- So there is no need to add to our already huge nuclear risks and debts
- As the consequences are completely unacceptable, all nuclear power plants should be phased out

Thank you for your attention

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