

Cost Savings and a Rational Energy Policy – It's About the Economy...

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Our current energy policy and law is wrong, legislating inadequate technologies to meet our energy needs at a huge potential cost to our economy and future prosperity. This is not opinion, it's the logical deterministic conclusion from the best information we have based on multiple well accepted independent studies and engineering facts. Most of the statements from politicians and partial experts are untroubled by joined up reality because most interviewers don't have the knowledge to argue, or believe the green propaganda which is almost the reverse of reality.

Our future economic competitiveness will require plentiful, cheap, sustainable energy, ideally zero carbon. Only nuclear power can deliver ALL this. Gas is the best practical gap filler.

- Wind was introduced to offset coal fired plant emissions, not replace them. Because it can't.
- Wind is **very expensive, 2-3 times current costs** of nuclear, coal and gas (see over).
- **Wind is demonstrably inadequate** to meet our current 60Gw peak power needs and **unreliable** in delivery without fossil back up costing c.1.5p/kWh, a bad idea. Storing wind energy on the grid simply makes an inadequate solution much more inadequately expensive.
- Every 1p per kWh on our 400 TWh annual energy bill costs the UK £4B pa. A solution that trebles energy costs unnecessarily is a multi £B economic folly for UK plc.
- Electricity needs will increase dramatically as fossil vanishes. **We will need 2-3 times more electricity** to heat, cook, charge vehicles, separate water from seawater, make Hydrogen fuel, etc. Nuclear can meet any such future need at today's prices. Wind can't.
- Fossil fuel will run out before 2100, nuclear power as our base load source is inevitable then.
- Only nuclear can largely hold its unit price going forward as fuel is a small part of the cost, we have plenty, and it can be made wholly sustainable using proven breeder technology.

Vietnam with 3% of our GDP plans 14 nuclear plants and China 132 by 2030, > 6 pa. Japan and Korea will be over 50% nuclear by 2020, India just bought 16 plants from Russia and has ambitious plans for Thorium fuel plants, France is already 80% nuclear. We have allowed 10 if someone wants to build them - in a distorted market where bad law favours an inadequate zero carbon technology over the best. Laws must change, preferably requiring input to the technological and economic choices by engineering professionals - so rationality predominates, the people that can deliver the best solution are enabled, and energy ideology is removed.

Wind isn't alternative. It means Billions wasted in return for power cuts and rationing from 2015 (rationing = "smart" meters), avoidable "conservation" costs - more rationing - and economic slow down. It is economic madness for our politicians to continue mandating the technology to achieve carbon reduction at an avoidable cost of £Bs and no quantifiable benefit, risking the future of our economy for an ineffective shibboleth when we have better and cheaper solutions available. Energy policy is about our economic survival, not belief.

- The laws subsidising inadequate alternatives should be changed to level the zero carbon playing field. All new alternative build should be reviewed to maximise the billions per annum saveable, e.g. £3.8B, £76B cumulative possible on the 2020 targets alone, as over.
- Nuclear power using well-tried PWR technology should be built on and replace existing coal fired plant sites at predictable costs. Modern nuclear is **far** cleaner and safer than coal.
- Gas fired turbines are the best gap filling technology, not wind or pumped storage. They can be built in 1 year (half wind) cheaply and easily connected to the grid and located wherever there is space and an existing connection (wind can't). They cost 3.5p per kWh (half wind) and £330M per GW to build (third of wind). They can be on and off line fast. By far the best short term gap filler while nuclear is built - to deliver zero carbon power for >40 years.

Nuclear is the real and only alternative to fossil. Lets get to zero carbon, sustainable, affordable, plentiful, cheap power our way, and give UK plc a decent chance in the new world order. Asia is going nuclear fast, the clock is ticking.

PTO

Independent Self Consistent Costings of Main Generation Modalities

Comparison of Build and Power Generation Costs from multiple sources

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nb: Each independent source has been "levelised" to reflect a consistent approach to costings from green field to decommissioning, **so costs are directly comparable within a column**. OECD is for multiple countries so has wider variations

Source	Royal Academy of Engineers 2004		UK Government 2008	OECD
Parameter:	p/kWh (ii)	Capital Cost £M/GW(i)	p/kWh	p/kWh 2010
Modality:	Current/Future	Current/Future		
Gas CCGT	2.2	300	5.2	3.4-4.5
Gas with CCS				
OCGT Gas (Gap fill)	3.4 - 3.6	330		
Coal (50% now)	3.4	800	5.1	3.0-5.0
Coal with CCS				
Nuclear	2.26 - 2.44	1,150	3.8	4.0-5.5
On Shore Wind	5.35 - 4.78	740 - 630	7.2	3.5-11.0
Off Shore Wind	7.19 - 6.34	920 - 780	9.2	6.0-15.0
More Unaffordable				
Biomass (<100MW)	6.76	1,840		
Barrage	TBD>All Others			
Wave	TBD>All Others	1400 E		

(i) Cost for building current Established PWR plant is well known. Next generation reactors will cost more early on, as with EPR in Finland and all capital projects, but they have 60 year lives vs. 40 before so improved economics than before and volume production WILL bring costs back in line with PWR over the thousands of nuclear reactors to be built

(ii) Whole life costing including decommissioning for all types and fossil back up for Wind.

COST COMPARISON EXAMPLE: Nuclear vs. Offshore wind to meet UK 2020 Targets

Cost Saving of £3.8 Billion per annum for 20 years by using nuclear vs. offshore wind, £76 Billion cumulatively.

20% of 2020 420 TWh power forecast is 420×0.2 TWh pa = 84 TWh (= 84 Billion kWh)

Wind cost of 84 Billion kWh energy at 0.068p/kWh (RAE average) = £5.7B pa

Nuclear cost of 84 Billion kWh energy at 0.023p/kWh (RAE average) = £1.93B pa

Savings to the economy using nuclear vs. wind = £3.8B per annum for 20 years.

Cumulatively £76 Billion over the wind farms life, all up.

nb: DECC mean values give £4.83Bpa. Nuclear energy requires no major Grid upgrades if built on existing connection points, is zero carbon, substantially renewable, and can be 100% renewable.

LONG TERM: Fossil will become unaffordable then unobtainable, nuclear inevitable as wind and other alternatives can't meet the total need nor be relied on. Beyond 2020 we can get to 70% zero carbon, renewable, low cost energy at today's prices with minimum dependence by extending the program to our remaining 10 or so GW of coal power with nuclear and replacing existing nuclear – probably with OCGT gas still covering the gaps fastest and cheapest – gas can be anywhere on the grid there is room and capacity to build it, a kind of Super Grid emergency generator. Wind is an expensive blind alley in this core generation mix driven by irrational greenery, and requiring rational numerate review wherever it is deployed.