

Sustainable Energy -- without the hot air

David MacKay is a Professor at the Cavendish Laboratory in Cambridge. He is an expert on renewable energy, and has just published a book with the above title (find it at www.withouthotair.com). His opinions on renewables in general, and wind power in particular, are doubly interesting, as he has just been appointed as Chief Scientific Adviser to the Minister for Energy and Climate Change, Ed Miliband.

Professor MacKay struggles very hard to be balanced and even-handed, but it is impossible to read his chapters on wind power without concluding that he has very serious doubts about the technology -- and therefore, presumably, about this government's "Dash for Wind". Forgive me, by the way, for returning obsessively to the subject of wind energy, but I believe it poses a huge threat to the British economy, firstly because British wind power will be hopelessly uncompetitive -- two to three times as expensive as French nuclear power -- and secondly because the government's plans are simply undeliverable, and we are threatened with a capacity short-fall in a few years' time which will leave us liable to power cuts, rolling blackouts and the three-day-week.

The good Professor debunks a lot of the glib claims of campaigners. "Offshore wind could power all UK homes", they cry. Yes, replies MacKay, but homes represent only 4% of British energy demand.

He asks how much power we could plausibly generate from on-shore wind, and bases his calculation on 10% of the UK land area. This figure, when you think about it, is enormous, and many might think it not plausible at all. At that rate, wind might provide 20 KWh per person per day. That's about half the energy used to drive an average fossil-fuel car thirty miles a day. And to do this, we should require 50 times the entire wind turbine fleet of Denmark -- one of the most wind-intensive countries in Europe.

Offshore wind, he estimates, could produce some 16KWh per person per day. But only if we committed an area two-thirds the size of Wales to offshore wind (which is only viable in shallow coastal waters). To deliver wind on this scale would require a girdle of wind farms round most of the country, playing havoc with sea-lanes and fisheries. Professor MacKay points out that these turbines would require nearly ten times more steel and concrete than would be required to build equivalent nuclear capacity.

The government's off-shore plans are more modest, envisaging only 4 KWh per person per day. But even this, says the Professor, needs 10,000 --*ten thousand* 3MW turbines, at a cost of around £33 billion. Fifty jack-up barges would be needed to install them to the government's schedule, and these alone would cost another £3 billion. That's billion with a "B", not million with an "M".

He lets slip another fascinating detail about offshore wind. Most of the cost-benefit calculations offered by wind advocates are based on a turbine design-life of 25 years, with production and installation costs amortised over a quarter of a century. But Professor MacKay records that at the big Horns Reef offshore wind farm in Denmark, all 80 turbines had to be dismantled and repaired after only eighteen months. In the UK, at the Kentish Flats site, a third needed new gear-boxes in the same period. Current offshore turbine designs are clearly not sufficiently robust for their very challenging and corrosive environment.

Taking all these points together, it is very clear that we need a re-think on wind energy. I am delighted that a man with such a realistic view as Professor MacKay will be a key adviser to our Climate Change Minister -- at least until May next year.