

Energy Fair

5th April 2011

Tim Yeo MP
Chair, Energy and Climate Change Committee
House of Commons
Westminster
London
SW1A 0AA.

Dear Mr Yeo,

The potential of renewables

A recent report in the Guardian¹ quotes you as saying:

If Britain abandons or significantly delays its programme of building new nuclear power stations, there are three inevitable consequences. First, electricity prices will rise. Second, Britain will not be able to meet its carbon emission reduction targets. And third, the risk that the lights will go out will significantly increase. This is because other forms of low-carbon energy, such as solar or offshore wind, are more expensive than nuclear. Solar and wind are not reliable generators of electricity – on cloudy, still days they produce nothing. So they have to be backed up by reliable sources of power. If nuclear is not used, that means more gas or coal, both of which have far higher carbon emissions.

I hope you will not mind me saying this, but *every one of these points is either factually wrong or seriously misleading*. I will take them point by point and will refer to my *Response to “The UK’s energy supply: security or independence,” an enquiry by the Energy and Climate Change Committee, February/March 2011* which you may have received by now. A slightly updated version is enclosed.² I will refer to the document as ‘ECCCR’.

“Electricity prices will rise”

There is overwhelming evidence that nuclear power is one of the most expensive ways of generating electricity. For example, Connie Hedegaard, the European climate change commissioner, has confirmed recently that nuclear power is more expensive than offshore wind power.³ The New York Times has reported evidence that solar power is now cheaper

¹ “Chris Huhne: Nuclear power may become less attractive option for UK” (The Guardian, 2011-03-19, <http://www.guardian.co.uk/politics/2011/mar/19/huhne-says-uk-might-have-to-drop-nuclear-option>).

² An electronic copy of the updated document, with live links, may be downloaded from <http://www.mng.org.uk/ecccsecurity1>.

³ See “Wind power cheaper than nuclear, says EU climate chief” (The Guardian, 2011-03-17, <http://www.guardian.co.uk/environment/2011/mar/17/wind-cheaper-nuclear-eu-climate>).

than nuclear power.⁴ A report about nuclear power from Citigroup says “Three of the risks faced by developers—construction, power price, and operational—are so large and variable that individually they could each bring even the largest utility company to its knees financially.”⁵ The Energy Fair group has calculated that withdrawal of just one of the subsidies for nuclear power (limitation on liabilities) would raise the price of nuclear electricity to about 20 US cents (12.4 pence) per kWh. Without the other subsidies it enjoys, it would be even more expensive.⁶ Details of these and other sources of evidence may be found on www.mng.org.uk/gh/nn.htm#subsidies. See also ECCCR Section 3.1.1.

The nuclear industry has been very successful at spreading the myth that nuclear power is cheap. Their misleadingly low figures for the cost of nuclear power have been widely quoted by other organisations, apparently without critical examination.

Without the subsidies that it enjoys, nuclear power would be entirely uncompetitive. Without that distortion (and other distortions) in energy markets,⁷ investment in renewables would certainly bring down the cost of electricity.

“Britain will not be able to meet its carbon emission reduction targets”

No:

- There is good evidence from reputable sources that renewables, with conservation of energy, can provide all of the UK’s present needs for energy (not just electricity) and anticipated needs in the future (see ECCCR Section 3.1).
- Renewables can be rolled out very much faster than nuclear power.⁸
- There is also good evidence that renewables can provide robust and resilient supplies of energy without the need for power from fossil fuels or nuclear plants (see ECCCR Sections 3.2 to 3.6).
- Nuclear power is far from being zero carbon. It has been estimated that nuclear power produces between 9 and 25 times more CO₂ than wind power.⁹ The carbon footprints of other renewables are about the same as wind power.

⁴ See “Nuclear energy loses cost advantage”, New York Times, 2010-07-26,

http://www.nytimes.com/2010/07/27/business/global/27iht-renuke.html?_r=4&src=busln.

⁵ See “New Nuclear – the economics say no; UK green lights new nuclear – or does it?” (PDF, 144 KB, report from Citigroup Global Equities Online, 2009-11-09, <https://www.citigroupgeo.com/pdf/SEU27102.pdf>).

⁶ See the “Nuclear Subsidies” report from Energy Fair, February 2011, http://www.energyfair.org.uk/actions/ec-complaint/nuclear_subsidies_feb_2011.pdf?attredirects=0.

⁷ In a report published in 2004 (See “Fossil fuel subsidies ‘must end’”, BBC News, 2004-06-21, <http://news.bbc.co.uk/1/hi/sci/tech/3818995.stm>), the New Economics Foundation made a conservative estimate that worldwide subsidies for fossil fuels amounted to about \$235bn a year—and there seems not to have been much change since then. Fossil fuels are also receiving subsidies because, even with the EU Emissions Trading System, the price being paid for emissions of CO₂ is far too low.

⁸ In 2010, Germany installed 8.8 GW of photovoltaic panels, producing about the same amount of electricity as a 1GW nuclear power station—but the nuclear power station would take about 7 years to build. In general, renewables provide a much speedier solution to the urgent problem of cutting emissions of CO₂.

⁹ See “Providing all global energy with wind, water, and solar power, Part I: Technologies, energy resources, quantities and areas of infrastructure, and materials,” Mark Z. Jacobson and Mark A. Delucchi, *Energy Policy* 39, 1154–1169, 2011, doi:10.1016/j.enpol.2010.11.040.

“The risk that the lights will go out will significantly increase. This is because other forms of low-carbon energy, such as solar or offshore wind, are more expensive than nuclear.”

No:

- There is no doubt that nuclear power is one of the most expensive ways of generating electricity (see above).
- Renewables can be built much faster than nuclear power stations (see above).
- Renewables can certainly meet all our present needs for energy, not just electricity, and anticipated needs in the future (see above).

“Solar and wind are not reliable generators of electricity—on cloudy, still days they produce nothing. So they have to be backed up by reliable sources of power. If nuclear is not used, that means more gas or coal, both of which have far higher carbon emissions.”

No:

- **All sources of power are intermittent** because all kinds of equipment can fail.
- When a nuclear or coal-fired power station fails, that is exceptionally disruptive because a relatively large amount of electricity is lost, often without warning. For that reason, **special arrangements are needed (the ‘Large Loss Response’), to ensure that the lights can stay on when a large generating plant fails.**¹⁰ Although the cost of the Large Loss Response arises because of the special problems caused by large generating plants, the cost is being shared amongst all kinds of generators. Not surprisingly, the owners and operators of the other kinds of generator think that is not fair.
- In a report published in 2009,¹¹ independent consultant David Milborrow says that **electricity transmission networks in the UK are *already* designed to cope with variability arising from the failure of power stations and from variations in consumer demand**, and that, for a small additional cost, wind power could provide up to 40% of the UK’s electricity. Further increases in the level of wind penetration are feasible and do not rely on the introduction of new technologies. There are several other kinds of renewables apart from wind and solar power and a range of techniques for matching supplies of electricity with variable demands (see below).
- The demand for electricity is constantly varying. To meet these variations in demand, **the most useful sources of electricity are those that can be turned up or down according to need, providing ‘power on demand’**. In that connection, nuclear power scores poorly because it cannot easily be varied according to need. Apart from gas-fired generators producing emissions of ‘fossil’ CO₂, **there are several renewable sources of electricity that can provide power on demand**. These include enhanced geothermal systems (EGS),

¹⁰ See “Exclusive: Will wind farms pick up the tab for new nuclear?”, Business Green, 2010-08-24, <http://www.businessgreen.com/bg/news/1804501/exclusive-will-wind-farms-pick-tab-nuclear>.

¹¹ “Managing Variability”, David Milborrow, July 2009, commissioned by Greenpeace, WWF, RSPB, Friends of the Earth, http://www.trec-uk.org.uk/reports/milborrow_managing_variability_final_july_2009.pdf.

hydropower, thermal power plants fired by biogas, tidal lagoons that combine pumped storage with power generation, and concentrating solar power with heat storage and backup sources of heat.

- Keeping power stations on ‘spinning reserve’ in case other power stations fail has been widely used in the past and is still used to some extent, but it is a very wasteful ‘last century’ practice. **Now there is a range of other options for matching supplies of electricity with varying demands**, outlined in ECCCR, Sections 3.2 to 3.6. These include the storage of electricity in pumped storage systems and tidal lagoons, the provision of a large-scale supergrid, renewable sources of power that can provide power on demand, vehicle-to-grid technologies, a range of methods for managing demand, and the provision of good data to anticipate variations in supply and demand.
- The “Combined Power Plant” in Germany¹² demonstrates how an inter-connected range of renewables can provide a powerful and reliable source of electricity.
- It is normal practice to provide about 25% of ‘plant margin’ to meet contingencies. An economical way to provide that plant margin, without emissions of ‘fossil’ carbon, would be to keep old gas-fired power plants in reserve, together with stores of biogas.

There is no doubt that renewables, including several that can provide power on demand, together with a range of techniques for matching supplies of electricity to variable demands, can provide plentiful and reliable supplies of power.

I hope these points are useful. I will be happy to discuss any relevant issues.

With best wishes,

Dr Gerry Wolff PhD CEng
Coordinator, Energy Fair

Copy: Chris Huhne MP

¹² See <http://www.kombikraftwerk.de/index.php?id=27>.