

# ARE RENEWABLE ENERGIES FUTURE PROOF?

- TECHNICAL SOLUTIONS NEEDED, OR “FORGET RENEWABLES”!?

- TARGETS,
- EXPECTATIONS,
- CHALLENGES
- SOLUTIONS ?



## ARE RENEWABLE ENERGIES FUTURE PROOF?

### - TECHNICAL SOLUTIONS NEEDED, OR “FORGET RENEWABLES”!?

We are all aware of the commitment the British government has made to source 15% of energy consumption from Renewables by 2020, and the challenges this brings given that we were in 2010 at 3.3%.

1. Although some people find this target is rather modest compared to other European countries, how are we going to achieve the required step-change?

The national grid released an overview of the main supply changes, see Table 1. So all hopes rest on Wind Energy, to compensate for reduced coal supply and an increased total demand.

It is also worth noting, that there seems to be no significant expectations towards solar energy.

Generation Type	Capacity (GW)	
	2010/11	2020/21
Coal	28.2	14.5
Coal (CCS)	0.0	0.6
Nuclear	10.8	11.2
Gas	31.9	34.7
Oil	3.4	0.0
Pumped Storage	2.7	2.7
Wind	3.8	26.8
Interconnectors	3.3	5.8
Hydro	1.1	1.1
Biomass	0.0	1.6
Marine	0.0	1.4
<b>Total</b>	<b>85.3</b>	<b>100.5</b>

Table 1: Total Transmission connected Capacity in “Gone Green” {1}

2. What are the challenges ahead?

In a lecture at the IMechE called “Forget Renewables?” (by Derek Birkett) the risk of feeding higher amounts of Renewables into the grid has to do with their unpredictability, i.e. the supply in peaks and troughs.

The argument was, the UK grid could not cope with this.

3. Looking over the edge of our plate.

To approach this with a can-do attitude, where could we look for solutions?

Given that China, USA, Germany or Spain all have a multiple of the installed UK capacity (see Figure 1 below), how do these countries cope with:

- a. Natural peaks and troughs in energy production?
- b. Wind cut-outs - the automatic turbine shut-down in periods of too high wind speeds, to protect structural integrity?



## Cumulative Wind Energy Capacity (2001-2011)

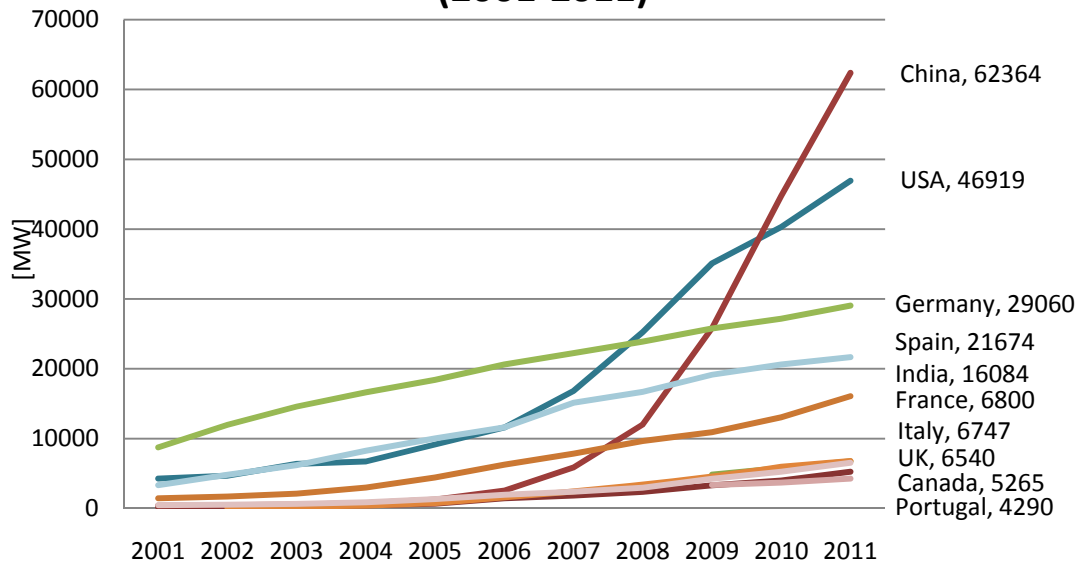


Figure 1: Cumulative wind energy capacity (2001-2011) {2}

Let's look again at the target for 2020. An increase in wind power capacity by app.20GW to 26.8GW. To put this target in perspective, we can find examples of step-changes in other countries. The USA increased their installed capacity between 2007 and 2009 by 18GW and China did this in just over 1 year in 2009-2010. Closer to home are no significant step-changes to be found. Germany and Spain both took over 10years to install the 20GW.

This leaves the question, which incentives the government is planning to put into place to create this level of growth. Cost will be a factor, as the UK predominantly sets on the costly off-shore generation, whereas all other countries above (Figure 1) focus on the cheaper on-shore energy generation. And not at least we have to find a solution for the problem with the grid.

### REFERENCE

- {1} National Grid, Operating the Electricity Transmission Networks in 2020, June 2011  
 {2} IntelligentFutures.co.uk, Wind Energy in the UK and Global Comparison, June 2012

For more details, see our website at: [www.intelligentfutures.co.uk](http://www.intelligentfutures.co.uk)

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