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Note on Pöyry Energy (Oxford) Ltd, *Implications of the UK Meeting its 2020 Renewable Energy Target,* a report to WWF-UK and Greenpeace UK (August 2008)

1. Pöyry Energy (Oxford) Ltd's study is being widely used to allay fears that there is an imminent firm capacity shortfall in the UK electricity sector. For example, Greenpeace's press release on publication states:

   The report finds that, if the UK government is able to achieve its commitments to meet EU renewable energy targets and its own ambitious action plan to reduce demand through energy efficiency, then major new power stations (burning either coal or gas) would not be needed to ensure that Britain can meet its electricity requirements up to at least 2020. The report also concludes that a strong drive for energy efficiency and renewable energy can reduce emissions and assist energy security.[1]

2. Note that the claim that new power stations would not be needed by 2020 is dependent on the satisfaction of the conditions:

   i. that the UK government is able to meet its renewable targets

   ii. that the UK government meets its energy efficiency targets

3. However, neither condition is likely to be met, and even if they were it is improbable that the result would be to obviate the need for new power stations. We believe that Greenpeace has been misled by the optimism of its premises. In effect they are postulating "If *p* then *q*" where *p* is nothing short of a miracle.

4. Pöyry are themselves entirely clear about the hypothetical nature of their work, particularly in the section entitled Limitations of the Study where they write:

   The results of this analysis are highly sensitive to some of the input assumptions and there are circumstances in which higher capacity requirements may be identified. […] If annual demand [for electricity] does not fall as

[1] Greenpeace, "Energy experts say renewables and energy efficiency could plug the "energy gap", 1 August 2008. See: http://www.greenpeace.co.uk/.

modelled, and/or peak demand changes are not proportional to annual demand shifts, then further conventional generation will become necessary earlier.[2]

5. They further observe:

   It should be noted that the electricity demand scenarios which are presented in this report are lower than the demand scenarios which are published by National Grid. […] The electricity demand scenarios presented here represent electricity demand which could only be achieved with significant changes in energy efficiency and reduction in end use demand.[3]

6. This is fair warning. Anyone familiar with the energy sector in the UK, and the nature and history of energy demand globally will be aware that the assumptions described here are improbable, and therefore that while the Pöyry study has academic interest it cannot be regarded as a reasonable guide to future UK energy needs.

7. The difficulty of meeting the second condition (energy efficiency) is key to understanding why the first condition (renewable energy) will not be met.

8. UK government is predicting that the UK in 2020 will use less energy then than now, in spite of postulated economic growth and all but certain increases in population, which is expected to rise from 60 to 63 million by that time.

9. This optimism is echoed in the Pöyry study for WWF-UK and Greenpeace, and is particularly acute in regard to electricity. For example, on page 2 of the report we read that the study assumes that the high electricity demand scenario is 400 TWh per year, with a peak load of 66 GW, and the low 290 TWhs with a peak load of 56 GW. Current electricity demand is ca. 400 TWh and peak load is 60 GW.

10. For comparison, if we consult the EU *European Energy and Transport Trends* (EETT) (2003) predictions, which are based on a Business As Usual case, the predicted consumption is 523 TWh, derived from a portfolio of 130 GW implying a peak load of somewhere under 100 GW. While this may be unduly pessimistic, it is clear that the "High Scenario" selected by Pöyry is extremely optimistic. It should be noted in passing that this scenario is based on the 2007 revision of EETT, which is based on UK government's predictions which assume that all demand reduction policies are successful.

11. However, and furthermore, it is by no means clear that even if energy efficiency improvements are forthcoming that this will result in reduced consumption of energy. The following chart shows that UK energy intensity expressed as energy per unit of wealth

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[2] *Implications of the UK Meeting its 2020 Renewable Energy Target*, p. 8.

[3] *Implications of the UK Meeting its 2020 Renewable Energy Target*, p. 15.

created has been declining over the long term, but at the same time overall consumption has been increasing.

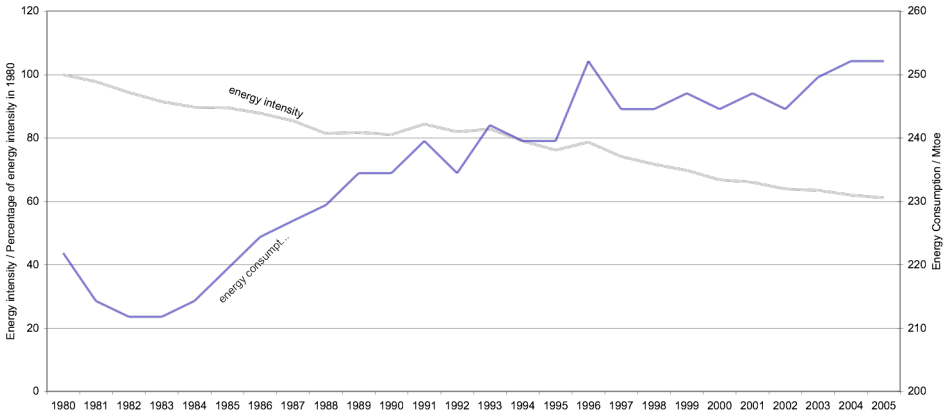

Figure 1. UK Energy Efficiency and Consumption. Source: EIA UK Energy Profile (2007)

12. Similar results obtain for other countries such as the US and Japan. Indeed, there is an extensive literature suggesting that the assumption that energy efficiency must lead to reductions in overall consumption is, at the least, an unreliable foundation for national governmental strategy.

13. In conclusion, then, **the Pöry study's assumption that energy efficiency will reduce overall consumption is extremely optimistic, and is not a sure ground for the formation of government strategy.**

14. The bearing of this on the ability of the UK to meet its renewables targets is simple. The UK renewable energy target for 2020 is for 15% of Final Energy Consumption, i.e. 15% of all energy consumed in the UK, across the heat, electricity and transport sectors. BERR has estimated that this will be 0.15 x 150 million tonnes of oil equivalent (mtoe). However, since BERR also assumed that high levels of energy efficiency improvements would drive down demand, this assumption is unsound. **It is arguably more probable that the target would be 0.15 x 180 mtoe, a quantity some 20% larger.**

15. This is of the importance, since the marginal cost of incremental renewable MWhs increases rapidly. A 20% error would lead to a disproportionally greater increase in total cost.

16. Furthermore, the burden on the electricity sector would be extremely high, requiring very large installed capacities of fluctuating renewables, particularly wind. The Pöyry study analysis of this situation relies on unrealistic degrees of capacity credit from wind (see p. 35), and on obsolete studies of wind power flows (see p. 38).

17. **Even at the levels discussed by Pöyry the renewables target is infeasible**; at the more realistic levels likely to obtain it is wildly so.

18. Due to **the study's optimism concerning energy saving and the feasibility of the renewables target the conclusion that no new conventional power plant will be needed before 2020 is of theoretical interest only, and appears to have little or no practical utility.**

19. By contrast, analyses presented elsewhere suggesting that there is a significant risk of a severe capacity crisis in the near future remain relevant, and are not grounded in improbable premises. For example see:

    i. Renewble Energy Foundation in its *Electricity Prices in the United Kingdom: Fundamental Drivers and Probable Trends* (May 2008: www.ref.org.uk)

    ii. Professor Ian Fells and Candida Whitmill, *A Pragmatic Energy Policy for the UK* (Fells Associates: (August 2008: http://www.fellsassociates.com/).

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