

REF

RENEWABLE ENERGY FOUNDATION

‘REF encourages the development of renewable energy and energy conservation whilst safeguarding the landscapes of the United Kingdom from unsustainable industrialisation.’

In pursuit of this goal, REF highlights the need for an overall energy policy that is balanced, ecologically sensitive and effective.

REF is a not-for-profit foundation formed by individuals concerned by the uncontrolled growth in proposals and planning applications for power stations in inappropriate rural areas.

We are part of a growing national consensus that the United Kingdom’s energy policy is unbalanced, and that the drive for renewable energy generation has been inadequately planned, a fact that has resulted in a developer-led industrial feeding-frenzy that is neither green nor sustainable. It is improbable that this current broad-scale industrialisation of the countryside will bring about any significant reductions in the emissions of greenhouse gases or meet the long-term energy needs of the UK (as laid out in the Feb 2003 Energy White Paper).

We aim to raise public awareness of the issues and encourage the creation of a structured energy policy for the UK, which is both more ecologically sensitive and effective.

REF will contribute to this debate by commissioning and publishing reports from leading consultancies and scientists to provide an independent and authoritative source of information.

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OUR AIMS

The main concern of REF is to change current policy on renewable energy as, in common with many engineers and industry experts, REF believes that the UK's current energy policy does not include strategy to meet any of the objectives indicated by the Prime Minister.

In his foreword to the Energy White paper, *Our energy future – creating a low-carbon economy* (TSO, 2003), the Prime Minister remarks that the energy policy is directed towards the achievement or maintenance of four goals:

1. **Environmental Protection**
2. **Security of Supply**
3. **Affordable energy, even for the poorest**
4. **Competitive energy markets to ensure low cost energy for producers and consumers, ensuring industrial competitiveness.**

In his final paragraph the Prime Minister further commits the UK to a fifth objective:

5. "This white paper sets out a strategy for the long term, to give industry the confidence to invest to help us deliver our goals - **a truly sustainable energy policy.**" (p. 3)

When the Energy White Paper goes on to discuss 'the environment' **it seems to be exclusively concerned with the reduction of harmful emissions in the biosphere, without regard to the fifth objective, that of sustainability at a local and a national level.** As has been argued recently by the President of the Institute of Chemical Engineers, "climate change" policy is a subset of sustainability, a point implicit in the Prime Minister's sequencing of his goals. However, by creating an artificial market situation, the Renewables Obligation, **the government has created conditions which encourage wind energy development on a scale and in a manner that contravenes every canon of "sustainability".**

In fact, the UK is now facing a widespread and unplanned industrialisation of the countryside and the destruction of some of our most precious heritage through the building of wind power stations. The principal motivators of this activity and its precise direction are developer convenience and landowner compliance. Ministers condone this by standing back from the market in order to foster competition, in accordance with goal four. It might be argued that Ministers are in fact abdicating responsibility for the consequences of the artificial market, which they have established through legislation.

The Energy White Paper itself and subsequent developments suggest that little or no recognition has been given to the genuine professional concerns expressed by organisations such as the Institute of Civil Engineers (ICE), the Institute of Chemical Engineers (IChemE), the Royal Academy of Engineering (RAE) and the Institute of Electrical Engineers (IEE) all of whom have offered serious criticisms of the government's policy.

The criticisms issuing from these bodies are numerous. The principal themes are:

1) The government has not planned to ensure security of electricity supply and over-commitment to gas in the medium, and even in the short term, is now all-but unavoidable (ICE) In 2002 the surplus generation capacity over maximum load fell to 12.4% (DTI DUKES 2003), Table 5.9)

2) The government's policy shows a marked over-emphasis on electricity generation in relation to CO₂ reduction targets when transport emissions are at least as important. (IEE: <http://www.iee.org/News/PressRel/z25feb2003.cfm>).

3) The government does not appear to have planned strategically for the maximum penetration of the grid by intermittent renewables such as wind generators (ICE submission to the House of Lords Science & Technology Committee Inquiry into the Practicalities of Developing Renewable Energy), **and consequently grid stability may be compromised.**

4) The government has not fully grasped the scale of wind generation required to match the capacities required to meet its targets (ICChemE). The Energy White Paper mentions 10,000MW installed renewables capacity for 2010. **This amounts to no less than 5,000 modern wind turbines.** Even if development on this scale is feasible, it is not clear that the wind resource is sufficient (this is particularly true of onshore wind). Developers routinely quote an average capacity factor of 0.3, but according to figures published in the recent Ofgem report on renewables (2004) and analysed by REF the actual achieved figures so far are very much lower (0.25 for Scotland, 0.24 for England, and 0.23 for Wales).

5) There is a lack of strategy for back-up generation to support intermittent renewables such as wind (ICE, RAE). This conventional generation must persist, but the government seems reluctant to plan.

6) The government seems to lack strong commitment to sponsoring both energy conservation and cleaner conventional generation(cleaner back-up is crucial if wind is to make any contribution). Working with data from the Energy Saving Trust we can calculate that insulating a loft and installing a condensing boiler in 3.5 million homes (approx 15% of UK households) to save an equivalent amount of power to that generated by 3000 turbines.

7) The government has failed to even attempt accurate predictions of cost of intermittent renewables It was left to the RAE, in their report *The Costs of Generating Electricity* (2004), to point out that the expense of maintaining back-up is part of the price of wind power.

8) The government does not appear to have engaged in any serious long-term planning for non-intermittent renewables such as tidal power, and the potential importance of biofuels

REF therefore aims to contribute to this debate and lead the growing call for a governmental rethink by drawing attention to problems in the current renewables policy.

There is a serious possibility, verging on a certainty, that the ongoing industrialisation of Britain's landscape with the latest generation of giant wind power-stations will not achieve the global environmental goals set by the government, and will destabilise our electricity supply. In this case, the nationwide sacrifice of vulnerable ecologies and communities will be worse than meaningless

The wider debate

Energy is not just electricity; indeed according to the DTI's *Digest of United Kingdom Energy Statistics 2003*, electricity was only 17% of total energy consumption (*DUKES 2003*, Chart 1.3). The energy question as a whole is a gigantic problem. There is no simple answer.

In 2002, the biggest sources of carbon dioxide emissions were power stations (29%), industry (23%), transport within the UK (22%), and the domestic sector (home heating and so on) (16%) (Figures from the DTI's *Energy – Its Impact on the Environment and Society – 2003 update*, para. 1.7).

According to DTI figures (*Energy – Its Impact - 2003 Update*, Table 1.1) while UK power stations emitted 43.1 million tonnes of carbon in 2002, **transport (only internal to the UK and excluding polluting air travel) emitted 33.7 million tonnes of carbon.**

Emissions from transport are at least as serious as those from electricity generation and they are **increasing** (up 6% between 1990 -2002, *Energy–Its Impact - 2003 Update*, Table 1.1), in spite of improved engine efficiency, simply because car use is increasing at a phenomenal rate. Transport is now 32.5% of the *total* energy budget for the UK (figure from DTI's *Digest of United Kingdom Energy Statistics 2003*, Chart 1.3).

Experts, both academic and industrial, are saying that **what we need is a balanced approach**, where energy generation is spread across the technologies. In other words we need a “bit of everything”, and this is especially true of renewables. The “low-carbon economy”, which most scientists regard as desirable, will have many components. While renewable generation of electricity is important, biofuel for vehicles is of equal significance, as are other renewable technologies which are currently marginalized.

In 2002, 150.4 million tonnes of human-caused carbon are estimated to have been emitted as carbon dioxide from the UK (figures from the DTI's *Energy – Its Impact on the Environment and Society – 2003 update*, para. 1.7). That's 551 million tonnes of CO₂. In 1999 the UK is believed to have contributed 2.5% of the world's emissions of CO₂ (*DUKES 2003*, para. 1.18).

Carbon dioxide contributes about 60% of the potential global warming effect of man-made emissions of greenhouse gases. (*DUKES 2003*, p. 206).

Whilst wind may still have a role to play, probably well offshore where the windstreams are stronger and more constant, it cannot ever be the whole answer, and we need to look at wide range of measures including the crucial area of energy conservation.

Focus needs to also be placed on conserving energy as well as on low emitting generation.

The Cost of Wind

CO₂ is emitted in the manufacture and construction of the turbines. Estimates of the life-time emissions per kWh were given in ETSU-R-122 (1999), and are still quoted in DTI documents (*Wind Energy Fact Sheet 14*), but these estimates are dated and do not refer to the current generation of giant turbines.. Fresh research on this matter is desirable.

The safety of wind turbines and their effect on the environment (water tables, nature and wildlife etc.) **is largely unexplored**. Damage arising from wind turbines in Germany alone has resulted in preliminary insurance payments in excess of 200 million euros. There are persistent reports of problems such as infrasound from these large moving structures (REF has corresponded with a European scientist who has measured its presence and related it to audible noise problems.).

However, apart from the environmental consequences, there are major financial costs to consider. The Royal Academy of Engineering report, *The Costs of Generating Electricity* (March 2004), estimated that wind power onshore and offshore were the most expensive form of generating electricity, at over 5p per kWh and 7p per kWh respectively, as compared to say coal and gas, which in their various forms are just under 2p per kWh or just over 3p per kWh.

The ‘Renewable Obligation system’ provides a system of indirect subsidy to renewable generators, which is drawn from our electricity bills. **The system is already funded by an increase of 2% on consumers bills** (according to the National Audit Office) and unless policy is changed this is set to rise substantially. **An average wind power station might earn 30% of its income from electricity sales and 70% from indirect subsidy** (figure calculated on the basis of data in *The Renewables Obligation: Ofgem’s first annual report*, February 2004, and other official figures from Ofgem and the Non-Fossil Purchasing Agency Ltd.).

Subsidy systems might make sense in this case if we were getting a soundly balanced and ecologically sensitive renewable energy portfolio. We have to take a cold look at much onshore wind and ask ourselves if we are in fact getting a good deal.

The REF Solution

We recommend the development of a coherent energy strategy based on expert opinion and well-informed debate.

Flaws in government handling of this keynote renewable energy policy have had important consequences on the rest of the country's energy policy.

It is imperative, therefore, that we have a balanced and rational approach to renewables.

At present, however, we have a renewables policy which appears to be directed by arbitrary government targets and developer self-interest. This is unsatisfactory, dangerous, and threatens to frustrate meaningful achievement of the basic aims of the government's Energy White Paper.

What we need is a measured and rational policy which serves the long-term needs of the entire population without needlessly industrialising our countryside. That's eminently possible. We've just got to put our minds to it.

To facilitate public debate, REF will establish the UK's first '*Information Bank*' for all forms of Renewable Energy Development.

REF will be the most authoritative, accurate, reliable and unbiased source of information on Renewable Energy, embracing all of the key issues associated with:

Security of supply
Energy conservation
Renewable Energy technology in every form
CO₂ emissions and the environment
International collaboration

REF seeks to challenge the immediate threat to our rural heritage from the wind power lobby and commission solid and accurate research into the potential problems of this power source. Issues that include:

Health & Safety
Human Rights
The Environmental Impact
Planning

REF's 3 main activities will be:

Lobbying – Calling for a cross party review of energy policy.

Information – Initiating and collating specific research, and creating and maintaining the most reliable and comprehensive database.

Administration – Maintenance of factual current data, the shortest and most effective lines of communication with local campaign groups and dealing with all relevant bodies including politicians, non-governmental organisations and media. Supporting where appropriate the creation of legal precedent in planning, Human Rights, and other related areas.