



CENTRE FOR POLICY STUDIES

ENERGY POLICY

THE FEEDBACK FROM REALITY

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SUMMARY

- The fundamental purpose of any energy policy should be to ensure the provision of reliable and affordable energy supplies.
- Any policy which pursues other objectives – however worthwhile they may be – risks ignoring the degree to which modern society is dependent on reliable and affordable electricity.
- The Spring 2007 meeting of the European Council of Ministers agreed a legally binding EU target that 20% of the region's inland energy consumption must be met by renewable sources by 2020.
- As far as the UK is concerned, these targets are unachievable. Hard economic, scientific and engineering constraints mean that such a huge development of renewables and such a great displacement of existing patterns of supply are not realistic.
- It would also be very expensive. The Renewables Obligation scheme which subsidises the development of renewable energy sources has cost £1.7 billion to date (the equivalent of £70 on the average household bill); it is forecast to cost £32 billion over its lifetime (the equivalent of £1,330 per household).
- The danger is that such an unrealistic energy policy and the pursuit of unachievable renewable energy targets could, in the coming decade, delay or even shut out viable alternatives such as clean coal and nuclear build.

- The International Energy Authority has concluded that, with increasing global demand and falling capacity, “the world’s current energy future is unsustainable”.
- For the UK, the position is exacerbated by high and volatile gas prices, uncertain environmental policies, and problematic planning and licensing procedures.
- There is an alternative. The twin drivers of climate change and energy security complement each other in directing the UK towards an aggressive programme of replacing fossil fuels with a combination of renewable energy and nuclear.
- Long before the end of this century, major changes in energy supply availability and patterns of energy use appear to be inevitable. These changes will take many decades to accomplish; hence the need for foresight that is based on the “feedback from reality” – and not on the eternal human faith in unknown possibilities.

CHAPTER ONE

INTRODUCTION

Dangers to a society may be mortal without being immediate. One such danger is the prevailing social vision of our time – and the dogmatism with which the ideas, assumptions, and attitudes behind that vision are held.

It is not that these views are especially evil or especially erroneous. Human beings have been making mistakes... as long as there have been human beings. The great catastrophes of history have usually involved much more than that. Typically, there has been an additional and crucial ingredient – **some method by which feedback from reality has been prevented, so that a dangerous course of action could be blindly continued to a fatal conclusion...** [emphasis added]

Thomas Sowell, *The Vision of the Anointed: Self-Congratulation as a Basis for Social Policy*, Basic Books, 1996.

The fundamental purpose of any energy policy should be to ensure the provision of reliable and affordable energy supplies.

The feedback from reality is that without, for instance, reliable electricity supplies a modern society could not function. No one should underestimate this threat to our welfare. Power cuts would create havoc with the economy. Businesses – far more reliant on computers now than in 1974 – would not be able to function. Transport systems, including elevators, would shut down. Water and gas systems, both of which depend on electronic controls

and electrically-driven pumps and compressors, would fail. Without backup power supplies, worst affected would be hospitals and other big institutional users of gas and electricity.

Any policy which dogmatically pursues other objectives – however worthwhile or noble those objectives may or may not be – risks ignoring these threats to our welfare.

THE VISIONS OF THE ANOINTED

Green politicians, Friends of the Earth, Greenpeace and other environmentalist groups have adopted policies that specifically exclude nuclear from the UK's future energy supply. While they talk about “transitioning to a low-carbon system”, they dismiss nuclear as an unacceptable energy source, depending instead on “clean renewable solutions with decentralised energy systems” and to “phase out coal and nuclear power”. The balance of supply after taking into account energy saving measures would come from substantially increased renewable contributions.¹

Such ambitions are not confined to these groups. Consider, for example, the European Union's report on energy that was released on 10 January 2007 and agreed at the Spring Meeting of the European Council of Ministers on 8 to 9 March. Here it was agreed that a legally binding EU target of 20% of the region's inland energy consumption must be met from renewable sources like wind and solar power by 2020.² The objectives of the policy are to reduce greenhouse gas emissions by 20% by 2020.

The aims of the EU Agreement are neither “especially evil or especially erroneous”. It is just that, as far as the UK is concerned, the policy objectives are unachievable.

The EU Council of Ministers' Agreement was described by the President of the Commission, Mr Barroso, as historic and, “was the most significant in which he had played a part... We can say to the rest of the world, Europe is taking the lead, you should join us in fighting climate change”.

¹ “Energy [r] evolution”, EREC and Greenpeace, January 2007.

² Presidency Conclusions CONCL 1, 8 to 9 March 2007.

Prime Minister Tony Blair echoed this view. “These are a set of groundbreaking, bold, ambitious targets for the European Union..... It gives Europe a clear leadership position on this crucial issue facing the world.”

The aims of the Agreement are certainly not either “especially evil or especially erroneous”, to use Thomas Sowell’s terms. It is just that, as far as the UK is concerned, the policy objectives cannot be achieved.

THE REALITY

Consider the arithmetic. On 10 January 2007 the European Commission published a communication giving a renewable energy road map, which sets out how a 20% target might be achieved.³ In response to concerns by France over the role of nuclear power, and countries such as Poland that rely on coal, the agreement will comprise “differentiated national overall targets”, with “due regard to a fair and adequate allocation taking account of different national starting points”. It suggests that for the EU as a whole the overall target could be met by the sector targets for renewable energy consumption as shown below.

Sector	EC suggested share of sector consumption from renewables for the EU	Actual 2005 share of sector consumption from renewables in the UK	Percentages of total inland UK energy consumption
Electricity	34%	4.58%	19%
Heating, etc	18%	0.67%	44%
Transport	14%	-	37%

Such revolutionary development of renewable resources and the displacement of existing patterns of energy supply in each of the sectors will not and cannot be achieved by any stretch of the imagination, especially by 2020.

Taking the overall sector share contributions suggested by the European Commission as an approximate guide, it is evident that starting from the present day, enormous transformations in the mix of the energy supply would have to be realised in order to accomplish such targets for the UK. Such revolutionary development of renewable resources and the displacement of existing patterns of energy supply in each of the sectors will

³ COM(2006) 848 final.

not and cannot be achieved by any stretch of the imagination, especially by 2020. Hard economic, scientific and engineering constraints prevent it from being otherwise.

At present 83% of renewable energy output in the UK is converted into electricity, the remainder being used for heating and other applications, coming from wood, agricultural and other waste and sewage gas. Where the extra sources of renewable energy are to be found to contribute 18% of the heating sector consumption is a matter of considerable speculation.

In the case of the electricity sector, the use of landfill gas, solar and marine technologies are not assumed to make significant further contributions by 2020.⁴ In addition, small, but still comparatively minor contributions could come from co-firing biomass with fossil fuels and dedicated biomass stations, assuming fuel supply requirements could be met. That leaves wind as the main source to be developed, where even with the possible inclusion of the Severn Barrage, many thousands more wind turbines would be needed both on and offshore. To appreciate the scale of the necessary response, if wind contributed about 20% of the UK's demand for electrical energy by 2020 then possibly 10,000 wind turbines would have to be manufactured and installed over the next 13 years depending on the sizes chosen and locations, or over two per day on average. Both manufacturing and construction resources may determine the actual level of activity possible.

In addition the necessary level of public subsidy has to be considered in order to realise this investment. According to OFGEM, the Renewables Obligation scheme of subsidy for such plant has cost business and residential consumers £1.7 billion so far – that is, with 24 million households in the UK, the equivalent to £70 on the average household bill – and in the existing form is forecast to cost £32 billion over its lifetime.⁵ At present the scheme is being reviewed by the Government in its current Energy Review.

It cannot be assumed at the outset, however, that the large amount of wind power capacity required could be accommodated either operationally by the other plant or within the limits of the system's daily total power demand cycles. In the latter circumstance, there would be a mismatch between the energy required and the necessary capacity that would need to be applied to

⁴ *Renewable Energy: Practicalities*, House of Lords Science and Technology Committee 4th Report 2003-2004, 15 July 2004.

⁵ Tim Webb, *The Independent*, 28 January 2007.

produce it. The failure to satisfy both requirements of energy supply and its acceptable rate of delivery, i.e. power,⁶ renders infeasible the conclusions of many, if not most, comprehensive energy policy studies and associated scenarios.⁷

When such considerations are added to those of the necessary construction schedule and costs entailed, not only for the plant, but also for the modifications to the transmission infrastructure and backup support, the target for the electricity sector is clearly impractical.

The danger is that such an unrealistic energy policy and the pursuit of unachievable renewable energy targets could delay or even “shut out” the viable longer-term options of new clean coal and nuclear build in the UK over the coming decade.

⁶ From an academic point of view, the confusion in the use and lack of understanding of the two terms, power and energy, is a sad commentary on our basic education.

⁷ See also, The Sustainable Development Commission Report on *Nuclear Power* March 2006; “*Energy [r] evolution*”, EREC and Greenpeace, January 2007, and countless claims by environmental and trade organisations and politicians both in Westminster and Scotland.

CHAPTER TWO

GLOBAL ENERGY DEMAND

The Paris-based International Energy Agency (IEA) advises 26 industrialised nations on their energy policy as well as studying the global energy supply and demand scene. It publishes annually *World Energy Outlook (WEO)*. By reference to *WEO 2006* and the latest IEA projections for 2030 in a 'business as usual' scenario:

- World energy demand is likely to rise by over 50% between now and 2030 and by more than 25% by 2015 alone.
- 83% of additional energy will come from fossil fuels, which will remain the dominant sources of energy.
- Coal will see the biggest increase in fossil fuel demand in absolute terms, driven mainly by power generation. Clean coal technology could be a useful power source for the UK.
- Over 70% of the extra demand will come from the large developing countries, mainly China and India, but also Russia, Brazil and Mexico. China alone will account for about 30% of extra demand.
- The environmental impact of China and India coming up to Western levels of GDP with associated carbon dioxide emissions from energy generation would be catastrophic.

- Almost half of the increase in global primary energy demand is for the generation of electricity and one fifth for transport.
- The world demand for electricity will almost double between 2004 and 2030.
- World natural gas burning will increase by some 70% to 2030 from an already substantial level on the IEA's projections, with the demand in the EU for gas in power generation and heat plants increasing by over 90%.

In view of these threats the IEA concludes that: "The world's current energy future is unsustainable."

With regard to the electricity supply industry:

- Falling power capacity reserve margins and ageing infrastructure – of both power plants and networks – give rise to a substantial need for increases in investment in many OECD countries including Britain. The IEA notes high and volatile gas prices, uncertain environmental policies, difficulties in siting new facilities and complicated and unreliable licensing processes, all of which are growing challenges for investors.
- Between 2004 and 2030 non-hydro renewables (wind, solar, geothermal) will grow the quickest, albeit from a small base, but nuclear power could make a major contribution to reducing dependence on imported gas and curbing CO₂ emissions. In reality this will only occur if Governments play a stronger role in facilitating private investment, especially in liberated markets.
- Europe's drive for wind power and other forms of renewable energy will not make a significant contribution to resolving this predicament in the foreseeable future. The share of renewables in EU electricity supply including hydro is forecast to increase from 15% to 28% from 2004 to 2030; and from 6% to only 14% (not 20%) of primary energy demand.
- At the same time in electricity generation nuclear power will shrink from 31% to 13%. The result is that the EU will rely more on fossil fuels.

The inevitable conclusion is that the world is facing simultaneously the two energy related threats: not having adequate and secure supplies of energy at affordable prices; and, without a curb on the growth in fossil energy demand, environmental harm caused by too much energy consumption.

In view of these threats the IEA concludes that:

The world's current energy future is unsustainable.

CHAPTER THREE

WHERE NEXT?

Of course nations can achieve their liabilities for emissions reductions by means such as by carbon offsetting. This has been described as “a completely unregulated growth industry that offers to take your money in return for cancelling out your contribution to global warming, by all sorts of dubious means such as planting forests, which may or may not survive. Rather like the medieval papacy selling indulgences, the offset people give absolution to the better-off in return for cash.”⁸ It is certainly no help in ensuring the provision of reliable and affordable energy supplies.

A more realistic approach would be to take the cue from the WEO – and to move the emphasis of UK energy policy away from the increasing use of hydrocarbon resources. This would be not only for environmental reasons, but also to help to ensure future security of supply.

This is necessary: the UK is the EU’s largest, and the world’s third-largest natural gas consumer, and in 2004 became a net-importer of natural gas. With the risks of importing gas from Russia and the Middle East only likely to grow, it is surely inappropriate for the electricity supply industry to be so dependent on volatile geopolitical considerations.

⁸ Janet Daley, *The Daily Telegraph*, 12 March 2007.

In addition, substantial new generation capacity is needed over the next two or three decades.⁹ All technical options therefore need considering. This should include an expanded but not exclusive use of renewable resources.

Consider the comments of Claude Mandil, Executive Director of the IEA made at the release of the recent report WEO 2006 on Thursday 1 March:

Britain risks becoming too dependent on natural gas unless it builds more nuclear power stations, boosts renewable resources and improves energy efficiency. The main threat to Britain is that new investment is focussing on gas-fired power generation at a time when Britain's own production is falling rapidly...

The most pressing need is for gas import facilities... Britain will have to build even more gas-fired power plants and wind farms to fill a looming hole in UK power generation over the next decade. In the longer term, Britain will have to find other ways of producing power, while cutting consumption through energy efficiency. We think that nuclear has to be part of the mix. Britain was right in saying that no technology should be ruled out on principle as the country tries to keep up energy supplies while cutting carbon emissions as part of the global fight against climate change. The challenges are huge, so we will need more of everything.

The biggest obstacles facing both new nuclear and renewable energy projects are planning and opposition from environmental groups and local residents. The planning system under which large projects are licensed, permitted and built, is a significant barrier to energy infrastructure developments and can become a risk to security of supply.

THE GRID

Apart from the planning difficulties associated with new power generation schemes over the next two decades, one further barrier that tends to be much overlooked is the appropriate national transmission system that will be needed. This is hampering the large-scale exploitation of renewable resources in Britain for electricity generation.

Of special importance is the North West region of Scotland where a significant proportion of the UK renewable wind, tidal and wave energy resources occur. Without major new transmission links within Scotland and interconnectors to

⁹ Today, the UK has an installed electricity generating capacity of 77 GW. However much of this capacity will come off-stream over the next decade as older nuclear and coal stations are decommissioned. Unless the capacity problems are addressed rapidly, then the UK is facing an estimated 32 GW electricity generation capacity shortage by 2016. See EDF Energy, *Energy Review Submission*, April 2006.

England, most of these renewable resources are unavailable to the UK as a whole: they cannot provide bulk supply to the major southern markets. And if such Scottish resources are developed as envisaged by the Scottish Executive and politicians, where is the surplus power to go? A coherent energy supply policy must also include a sound network development policy. Without considering feasible means of delivery from sources of supply to consumers, an energy policy focusing on questions of supply alone could be meaningless.

THE NUCLEAR OPTION

Environmental activist groups want fossil fuel power plants and nuclear plants phased out, claiming that conservation, efficiency and renewables alone will provide sufficient energy to power the UK's cities and manufacturing sectors.

Empirical evidence does not support this vision of the world, however, which from the pragmatic viewpoint is fundamentally unsound. Instead the twin policy drivers of climate change and energy security complement each other in directing us towards an aggressive programme of replacing fossil fuels with a combination of renewable energy and nuclear.

One environmentalist who has accepted this proposition is Dr James Lovelock FRS, a lifelong environmentalist and member of the green movement. He has commented that:¹⁰

The Green idea that renewable energy can fill the gap left by retired nuclear power stations – and also meet the constantly rising demand for power – is romantic nonsense. Though it (nuclear) is so much cleaner and safer than fossil fuels – and also easily the cheapest, according to a recent European Commission study – we allow Greens to exploit our fears (concerning safety) in the same way that churches not long ago preyed on our fears of hell-fire.

Only because of this pressure, not for any rational reason, governments are afraid to grasp the nuclear lifeline. If a scientific or engineering reason exists against it, I am yet to hear it. Certainly, no Green organisation has come up with a single argument worth considering.

Unless we stop fretting over tiny statistical risks – even if they exist – and focus instead on protecting the planet we live on, our prospects look bleak. And they will be much worse for our children and grandchildren. In this electric world, nuclear energy is our one spark of hope.

¹⁰ James Lovelock, *Readers Digest*, May, 2005.

CHAPTER FOUR

CONCLUSION

If the ideas, assumptions, and attitudes behind green energy visions, such as contained within the EU energy policy for 2020, mean that a course of action is blindly continued towards an unachievable conclusion, then the feedback from reality will ensure that conventional fuel use will continue. The concerns of the IEA will not be met with regard to the provision of adequate and secure supplies of energy at affordable prices, or the curbing of both the growth in fossil energy demand and the increases in environmental harm caused by too much energy consumption.

Within a broader perspective, the choice for policy makers will then appear to be between global warming, nuclear power and keeping poor people poor.

Long before the end of this century major changes in energy supply availability and patterns of energy use appear to be inevitable. These changes will take many decades to accomplish; hence the need for foresight that is based on the “feedback from reality” and not – *omne ignotum pro magnifico* – on the eternal human faith in unknown possibilities.¹¹

¹¹ “Everything unknown has great potential.” Tacitus, AD 54.



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