

# Energy efficiency in the UK Energy White Paper – How did it get a central role?

Nick Eyre

Energy Saving Trust  
21 Dartmouth Street  
London  
SW1H 9BP  
Nick.Eyre@est.org.uk

Dan Staniaszek

Energy Saving Trust  
21 Dartmouth Street  
London  
SW1H 9BP  
Dan.Staniaszek@est.org.uk

## Keywords

Energy efficiency, energy policy, climate change

## Abstract

The UK Energy White Paper, published in February 2003, made a commitment to put the UK energy system on a path towards a 60% reduction in carbon dioxide emissions by 2050. Improving energy efficiency was identified as the most important short-term contributor to this goal, and also uniquely able to contribute simultaneously to all the objectives of the new energy policy.

This paper considers the process of policy development that led to such a fundamental shift in a national energy policy that had previously been dominated by supply side considerations. It sets out the history of analyses that identified a significant potential for energy efficiency improvement; the weakening of key supply side vested interests by UK energy market liberalisation; the political context of the UK Government's climate change commitments; and how these factors led to a policy change. It sets out how energy efficiency came through the long process of White Paper development as a 'major winner'.

The paper sets out the main policy instruments that have been identified as important in delivering energy efficiency in different market sectors. It discusses the further developments needed in UK energy policy to allow energy efficiency to play a key role in delivering a low carbon economy.

## Introduction

In the UK Energy White Paper published in February 2003 (Department of Trade and Industry, 2003), the most striking

commitment was to put the UK energy system on a path towards a 60% reduction in carbon dioxide emissions by 2050. To make this long term aim more concrete, it was accompanied by a restatement of the aim from the governing Labour Party's manifesto of a 20% reduction in carbon emissions (based on 1990 levels) by 2010 and further significant progress towards the long term aim by 2020.

Improving energy efficiency was identified as the most important contributor to short and medium term goals. In the short term over 70% of the carbon emissions reductions are expected to come from energy efficiency over all sectors of the economy. Energy efficiency was also identified in the Energy White Paper as the only set of technologies able to contribute simultaneously to all four of the objectives of the new energy policy – tackling climate change, security of supply, economic competitiveness and social equity.

This paper considers the process of policy development that led to such a fundamental shift in a national energy policy that had previously been dominated by supply side considerations. It does not seek to undertake a critique of the effectiveness of the policies that flow from the process.

## Methodology

The authors of this paper are not academics; rather we work for an organisation that seeks to deliver practical measures to improve energy efficiency and we have been involved in some of the policy development processes we discuss below. From this experience, we know that no single disciplinary perspective alone can explain changes to energy efficiency policy and practice. The role of energy efficiency in wider energy policy is determined by a number of factors – notably

knowledge of energy efficiency opportunities, understanding of the practical constraints to implementation in different parts of society and the importance of different drivers within energy policy to which energy efficiency can contribute.

Understanding energy efficiency policy therefore requires inputs from technological and social science. In that sense the methodology of this paper is influenced by the thinking of socio-technologists, who emphasise that large scale technical change requires systemic change involving the conjunction of technological availability and social acceptability.

But we also know from experience that policies and politics matter. Except in a crisis, policy makers are only likely to consider incremental change, so that major policies proposed must be based on options that have been observed to be successful in a related context. And policy makers come to decisions with particular experiences and prejudices, so that the individuals involved and the context of the decisions required can greatly influence the outcome.

The methodology of this paper is therefore first to set out the extent and type of knowledge about energy efficiency, starting with the period following the oil crises of the 1970s. We then set out the experience of key energy efficiency policies in the UK in recent years. We follow this with a description of the political context in which the 2003 Energy White Paper was drawn up, bringing the threads together to show how this allowed energy efficiency to play an increased role in energy policy.

## A Brief History of Energy Efficiency Analysis in the UK Energy Policy

### BEGINNINGS IN THE OIL CRISES

The oil crises of 1970s provoked interest in energy conservation throughout the developed world. In the UK, the initial crisis of 1973/74 was deepened by a simultaneous industrial dispute in the UK deep mined coal industry (at that time the dominant fuel supply source for power generation). The resulting power outages and political dispute led to the fall of the Government and a politicisation of the energy sector. Even 30 years later there is a predisposition of the political left to support the coal industry and the political right to support nuclear power. During this period, the prospect of oil running out within a few decades was a key issue. The energy efficiency response was initially simplistic – a ‘Save It’ campaign to reduce unnecessary energy use – with very short term goals related to security of power supply. Similar responses can be seen in similar contexts much more recently, for example in the California energy crisis.

As the immediate crisis diminished, interest in energy saving switched away from energy conservation (i.e. doing without) towards energy efficiency. Programmes to promote development and demonstration of key technologies were established. And in industry, with the driver of higher energy prices, Government promoted more systematic approaches to energy management, resulting in a cadre of energy managers and a culture of interest in energy, at least in large energy users and the public sector – local authorities

were expected to employ an energy manager for every £1M per year of spend on energy. This persisted through the 1980s, even in the face of falling energy prices.

### EARLY STUDIES OF ENERGY EFFICIENCY POTENTIAL

The energy crises also stimulated interest in the long term potential of energy efficiency. It has always been obvious that the thermodynamic potential of energy efficiency is very large, but in the days of cheap energy that fact had been treated as a theoretical curiosity of little practical importance. The energy crises stimulated a wave of ‘alternative energy studies’ that focussed on the potential of energy efficiency and renewable energy. The pathways of energy through industrial society were studied systematically (e.g. Chapman, 1975), providing opportunities for analysis of energy efficiency improvement. The best known work from this period (Lovins, 1977) set out a manifesto for a completely different energy system. UK based studies showed the potential for huge improvements in energy efficiency in the UK that differed markedly from official energy projections (Leach, 1979; Foley and Nassim, 1981). Similar studies were done for other economies and later on a global scale (e.g. Krause, 1989; Lazarus, 1993).

With the wisdom of hindsight, we know that most commentators failed to foresee the combination of industrial restructuring and energy efficiency improvement that left UK primary energy use lower in 1993 than it had been 20 years earlier. Official projections and conventional wisdom about energy was predicated on the assumption that energy use, and particularly electricity use, would continue to grow at the very high rates experienced in the 1960s. These were not founded in any assessment of what the energy would actually be used for. In retrospect this seems extraordinary, but at the time the link between social progress, GDP and energy use was deeply embedded in the psyche of most policymakers. Moreover, the initial studies on energy efficiency that showed the possibility of radically different energy futures were undertaken in the context of a highly politicised energy world. Alternative ‘low energy’ projections, even when founded on closely argued analysis were rejected, at least in part, because they were (often wrongly) associated with the emerging green movement that rejected economic growth (e.g. Goldsmith and Allan, 1972; Meadows et al, 1972) or with critiques of nuclear power (e.g. Patterson, 1976).

### THE DEVELOPMENT OF AN ANALYTICAL CONSENSUS

Despite official rejection of low energy futures, evidence for the practical potential of energy efficiency grew. Not only did energy use actually fall, but also experience from Government funded energy efficiency programmes accumulated. By the 1980s it was clear to energy efficiency practitioners that a cost effective potential of at least a 20% improvement existed in all sectors. This was summarised in detail for individual sectors (Department of Energy, 1984; Department of Energy, 1988; Department of Energy, 1989a; Department of Energy, 1989b).

The conclusion that there is a significant potential for cost effective energy efficiency improvement in the UK has never subsequently been seriously undermined. It has frequently been contested – but usually by neo-classical

economists working within the purely theoretical framework of their particular paradigm (i.e. that there can be no cost effective opportunities in a perfect market and that all markets approximate to perfect markets), but never by anyone who has taken the trouble to investigate the economic evidence. Data on costs of real energy efficiency programmes (e.g. National Audit Office, 1998) have confirmed cost effectiveness. Evidence about the way decisions are taken in real markets (e.g. Katzev and Johnson, 1987; Komor and Wiggins, 1988; Cebon, 1992; de Canio, 1993; Lutzenhiser, 1993; Kempton and Layne, 1994; Koomey and Sanstad, 1994; Sanstad and Howarth, 1994; Eyre, 1997b) has explained why cost effective energy efficiency potential can be large, because energy consumption behaviour does not approximate to the text book model of rational consumers.

For most of the late 1980s, with falling energy prices and limited environmental drivers, political interest in energy efficiency declined. However, the interest in climate change in the late 1980s stimulated new activity to bring together estimates of energy efficiency potential. Energy efficiency was identified as the key component of a low carbon strategy in a presentation on energy requested by Prime Minister Thatcher to her Cabinet (Currie, 1989) and in an early UK submission to the IPCC (Department of Energy, 1989c) as well as leading independent analyses (e.g. Grubb, 1991).

Throughout the 1990s, the evidence about the scale of energy efficiency potential and the nature of the constraints to its delivery grew in the UK, as elsewhere. However, the dominant theme in energy policy was privatisation and liberalisation (see below). In the context of a non-interventionist Government, the prospects for strong energy efficiency policies were poor. The Government of the day's climate change goal of stabilising emissions at 1990 levels by 2000 was unambitious and clearly going to be achieved without major energy efficiency policy change.

New studies outlining the potential for energy efficiency only emerged in number with the prospect of a new Government committed to a 20% reduction in carbon emissions by 2010. This was clearly going to rely heavily on energy efficiency improvements. Initial studies confirming its practicality (e.g. Eyre, 1997a; Leach et al, 1997) were from independent sources although they relied on the existing analytical consensus. In an atmosphere of heightened political discussion on the issue an early semi-official study (Smith and Marsh, 1997) reaching similar conclusions was withdrawn around the time of publication. Only after the election of a new Government did their officials begin an analysis of the policies required to ensure the target would be delivered – inevitably drawing on the analytical consensus developed over the previous 20 years.

## FORERUNNERS TO THE ENERGY WHITE PAPER

### The UK Climate Change Programme

The revised UK Climate Change Programme was published three years later (DETR, 2000). Following a very detailed analysis, it set out policies to deliver a 19% reduction in carbon emissions, i.e. sufficiently close to the Government's target to be politically acceptable. Energy efficiency was the key delivery mechanism: the programme itself identified that over half the carbon emissions reductions would come

from improved energy efficiency in buildings and industry; closer inspection shows that inclusion of transport sector energy efficiency raises this fraction to over 70%. The key energy efficiency policies set out were based on those that were already being used or consulted upon, for example the Energy Efficiency Commitment and the Climate Change Levy package (see below).

### The Royal Commission on Environmental Pollution's 22<sup>nd</sup> Report

Royal Commissions are quintessentially British institutions – committees of eminent people from different backgrounds brought together to address problematic issues in public policy. They are appointed under royal charter and therefore are independent of the Government of the day. That independence provides credibility and allows them to recommend difficult policy options. Although their recommendations are only advisory they are difficult for Government to ignore.

The Royal Commission on Environmental Pollution is the only standing (i.e. permanent) Royal Commission. Following influential reports, including on nuclear waste and on transport policy, it began a major study on energy policy in 1997 that was finally published in 2000 (RCEP, 2000). The relatively relaxed timescales of a Royal Commission report (compared to other Government activities) allowed in depth studies of the key issues. It commissioned a detailed study on the scope for energy efficiency improvement which, inevitably, reached a broadly similar conclusion to other informed studies.

Coming from an environmental perspective and in the context of the Kyoto Protocol, it was inevitable that climate change would be a major focus. The headline recommendation was that the Government should adopt an energy strategy to 'put the UK towards a 60% reduction in carbon emissions by 2050'. To support this, the Royal Commission reported different energy projections in which this target was achieved. It emphasised the importance of further large improvements in energy efficiency.

### The Cabinet Office Energy Review

Immediately following his re-election in May 2001, Prime Minister Blair announced a review of long term energy policy. It was undertaken by the Cabinet Office's Performance and Innovation Unit (PIU) – a unit reporting directly to the Prime Minister. In this way the review was undertaken within Government, but outside the departments responsible for day to day policy making.

The review built on a study begun by the PIU earlier in 2001 on 'Resource Productivity and Renewable Energy' and so (perhaps uniquely in the history of reviews of UK energy policy) began by consideration of energy demand and energy efficiency. The team undertaking the review was composed partly of Government officials and partly of secondees with relevant experience from outside Government. Much of this experience focussed on energy efficiency and renewable energy.

The report was published in February 2002 (PIU, 2002). It provided the intellectual foundations for a new energy policy, in particular by arguing the need for Government intervention in energy markets to regulate natural monop-

lies, to promote innovation and address market failures in energy efficiency markets. It identified the need to reduce carbon emissions as a major driver of future energy policy.

The conclusions on the potential for further energy efficiency reinforced the strong analytical consensus that already existed. The Review called for a 'step change' in the rate of energy efficiency improvement. It has been noted that such a step change is only possible if interpreted as a step change in the rate of energy efficiency improvement, and that it is only effective if this is maintained over a long period (Wade and Leach, 2003). The Review suggested targets for energy efficiency improvement should be set in each sector of the economy. The identification of pervasive energy efficiency market failures allowed the report to go somewhat further in proposing policy interventions. It proposed that in each sector, the agents best placed to improve energy efficiency should be identified and requirements (or strong incentives) to act placed upon them. In effect, this provided the analytical justification for some of the climate change policies that were already in the process of being adopted.

### Experience with Energy Efficiency Policies in the UK

So by 2002, the intellectual argument for a key role for energy efficiency in energy policy and for stronger market intervention to promote it were in place. Already a number of policies had been adopted that were proving effective. These are described in this section.

#### BUSINESS ENERGY TAXATION AND ASSOCIATED MEASURES

In large businesses, energy efficiency can be undertaken effectively by the business itself provided that there are sufficiently strong incentives. A tax on energy use in businesses and the public sector, the Climate Change Levy (CCL), was introduced in the UK in April 2001, following extensive consultation. The level of the tax is £4.3/MWh for electricity and £1.5/MWh for gas and coal (oil products are subject to a different tax regime), adding 10-25% to fuel prices. As a direct incentive for improving energy efficiency, this is rather weak. Bigger incentives for carbon emissions reduction arise from the range of discounts and exemptions. Most importantly for energy efficiency, companies in certain sectors are eligible for an 80% discount on the CCL in return for participation in a negotiated sectoral Climate Change Agreement (CCA), which is a legally binding agreement to improve energy efficiency. And part of the revenue from the CCL was channelled into the work of a new organisation, the Carbon Trust, with a mandate to stimulate business energy efficiency.

Analysis of the Climate Change Programme (Defra, 2004b) shows that it is the CCAs and the work of the Carbon Trust rather than the price effect of the CCL itself which are most effective in improving business sector energy efficiency.

#### BUILDING AND PRODUCT REGULATION

Smaller energy users such as households, small enterprises and the low energy intensity commercial sectors have less incentive to use energy efficiently than larger industrial users, and fewer skills to implement energy efficiency measures. In these sectors it is generally more effective to target energy efficiency policies via the manufacturers of energy using equipment – both products and buildings.

The primary responsibility for regulation of the energy efficiency of traded goods in Europe lies with the EU. The system of labelling of consumer products covers the highest energy using products. Minimum standards apply to only a few products; negotiated agreements with manufacturing trade bodies are more widely used. There is concern that the limited use and level of minimum standards leaves energy efficiency product policy in Europe behind other developed countries (Meier, 2004). However, there are prospects for improving this situation through the introduction of a more flexible regulatory framework under the proposed Framework Directive on eco-design of energy-using products (European Commission, 2003a).

Within the UK, the value of energy labels has been significantly improved through linkage to other policy measures. The Energy Saving Trust's *'Energy Efficiency Recommended'* scheme has used the information provided by the EU label to promote the highest energy efficiency equipment. Most importantly, incentives provided by energy suppliers under their own legal obligations (see below) have provided subsidies to recommended appliances, via retailers, rapidly transforming the market.

Regulation of buildings is effectively a member state responsibility. Although there is an EU-wide framework (European Commission, 2002), performance standards are set nationally. UK energy efficiency standards have traditionally been poorer than those of other northern European countries, but this is changing. The heat loss standard for the fabric of new housing was reduced by 25% in 2002 and it is proposed to reduce this by a further 25% in 2006 (ODPM, 2004). Equally important, building regulations are now being used to require improvements to the standard of some components installed in existing buildings – the 2002 regulations effectively require the use of low-emissivity double glazing and the proposed changes in 2005 will require 86% (higher calorific value) efficient (i.e. condensing) boilers in most household replacement applications.

#### THE ROLE OF ENERGY SUPPLIERS

The most distinctive aspect of UK energy efficiency policy as it affects the residential sector has been the use of obligations on energy suppliers to deliver energy efficiency measures to their household customers. The original idea was based on the successful experience of demand side management and least cost planning in monopoly utilities in the USA and some parts of Europe (see, e.g. Boyle, 1996; Hirst et al, 1996). But it has been progressively modified to suit the competitive UK energy market.

These obligations, known originally as the Energy Efficiency Standards of Performance have grown in size and scope since they were first introduced in 1994 on the 12 electricity suppliers in England and Wales. The scheme was extended to include the 2 Scottish electricity suppliers in

1995, and a separate scheme was established in 1997 for the monopoly supplier in Northern Ireland.

The year 2000 saw two major developments. Firstly, with the merging of the electricity and gas regulators into a single energy regulator, Ofgem, the scheme was extended in Great Britain<sup>1</sup> to include gas suppliers. However, of more significance was the enactment of the Utilities Act, under which the Government took powers to set the energy saving target itself. This took effect in 2002 with the introduction of the first phase of the renamed Energy Efficiency Commitment, while the second, larger phase was launched in April 2005 covering a 6-year period to 2011 (subject to a review in 2007).

The growth in importance in the obligations over the 11 years can be amply demonstrated by the level of expenditure assumed in setting the energy saving targets – in 1994, it was £24 Million per year; in 2005, it is £400 Million per year. Over this time, they have twice been reviewed by the public spending watchdog (NAO, 1998, 2004) and received favourable assessment. The mechanism has been resilient in the face of various changes over the years – a switch from a customer levy to a “cost of business” funding mechanism; introduction of retail competition; changes in geographic coverage and in terms of customer types and fuels; mergers, new entrants and withdrawals from the energy supply market. Furthermore, the obligations are seen as one of the most important means of achieving household carbon savings to 2010, alongside building regulations. And they are potentially instrumental in beginning the process of transforming energy suppliers into energy service providers.

The UK experience has been influential in developing recent thinking about the role of energy suppliers in energy efficiency in Europe, notably in the development of proposed white certificates in France (Tabet, 2003) and in the proposed EU Directive on Energy Services (European Commission, 2003b).

### The Politics of Energy Efficiency

Energy efficiency does not generate the same level of public or political controversy as most energy supply options; there are no heated debates between vehement supporters and opponents, in the same way there are about nuclear power or wind energy. Indeed it is difficult to find anyone who claims to oppose energy efficiency – it is a ‘motherhood and apple pie option’. But that does not mean energy efficiency is apolitical. The politics of energy efficiency are not about what policy makers say, rather what they are prepared to do – the extent to which they are prepared to make the types of interventions set out above. Whilst energy efficiency itself may be uncontroversial, investing, taxing and regulating to deliver certainly is not.

### IMPLICATIONS OF ENERGY MARKET REFORM

In the UK in late 1980s and for most of the 1990s, the key political debates about energy were about ‘market reform’ - privatisation, restructuring and liberalisation. So despite the comprehensive analytical evidence amassed over 20 years

and outlined above, energy efficiency remained on the sidelines of UK energy policy debate until the rise of climate change as a political driver. But in retrospect, it is clear that energy market reform did have some important implications for energy efficiency policy.

Market reform transformed the institutions of the energy sector. Until the mid 1980s, UK energy policy was dominated by major public corporations – the National Coal Board, British Gas, the Atomic Energy Authority and the Central Electricity Generating Board – all with a supply side agenda. The energy sector was an instrument of industrial and economic policy and there was a highly politicised struggle between the coal and nuclear industries for dominance in power generation. But the UK coal industry was fatally weakened by a year long industrial dispute between the miners and Government in 1984/85. Privatisation of the electricity industry in 1990 revealed the uncompetitiveness of the nuclear industry. It also stimulated a ‘dash for gas’ in power generation as the privatised electricity generation industry invested in low capital cost combined cycle gas turbine technology as an alternative to the dominant coal fired power plants preferred in the publicly owned system in power generation. The capital intensive coal and nuclear sectors were clearly uncompetitive in the new markets conditions and the institutions of state-owned energy supply lost their dominance, leaving a policy agenda more open to other influences, including action on energy demand.

Market reform also created explicit opportunities for energy efficiency regulation. In the UK at least, market reform was not ‘deregulation’. Indeed it was the opposite – new regulatory agencies were created in the gas and electricity sectors where previously control had been concentrated in monopoly supply companies. The legislation of market reform included explicit provisions allowing the new regulators to intervene to promote energy efficiency. Particularly in gas, these powers were initially hardly used because of the fixation of the regulators with supply side competition. But the framework was established that eventually allowed the system of energy supplier obligations described above.

### THE GROWING ROLE OF CLIMATE POLICY

Since the late 1980s, the UK Government has seen itself at the forefront of international climate policy. Despite the reluctance of her Government to intervene in energy markets, Prime Minister Thatcher was an early advocate of the need for action on climate change, leading eventually to the creation of the Energy Saving Trust in 1993, following the Rio Earth Summit.

Very soon after its election in 1997, the Blair Government played a leading role in the negotiation of the Kyoto Protocol. Action at home was somewhat slower. The Government’s domestic priorities were education, health and crime, not energy, transport or the environment. Moreover, the separation of responsibilities for energy efficiency, transport and climate policies (in the Department for Environment, Transport and Regions) from energy policy (in the Department of Trade and Industry) resulted in an unhelpful di-

1. England, Wales and Scotland

chotomy between climate change goals and an energy policy still focussed on the aftermath of market liberalisation.

The result of these political and institutional problems was, as noted above, that the revised Climate Change Programme setting out the policies to deliver the Government's own target took three years to develop. Moreover, the Programme was simply a compilation of individual carbon saving measures rather than any fundamental restatement of energy policy.

However, it became clear that climate policy was having an impact on energy policy through the measures already introduced by 2000. Energy suppliers were increasingly vocal about the implications for energy prices of their obligations to promote energy efficiency and renewables. Many business groups, including the influential Confederation of British Industry, were strongly opposed to the price effects of the Climate Change Levy, despite the care that went into policy design to minimise impacts on industrial competitiveness. And the construction industry was very reluctant to adopt tougher energy performance standards.

In this context of opposition to the impact of climate policies on energy policy, an overtly revised energy policy became increasingly desirable. The recommendation of the Royal Commission on Environmental Pollution concerning the need for a long term reduction of 60% in carbon emissions (RCEP, 2000) was the final piece of the jigsaw. UK Governments are required to respond to Royal Commission recommendations. Responding to this particular recommendation clearly required taking a serious look at long term energy policy – hence the Energy Review and then the Energy White Paper.

#### **ENERGY EFFICIENCY AND THE NUCLEAR QUESTION**

The UK nuclear industry was seriously weakened by having its finances exposed to the rigours of electricity market reform. But the growing importance of climate change seemed to provide an opportunity for the nuclear industry to re-establish its role. The long term projections of the Royal Commission on Environmental Pollution included some in which nuclear power played an important role.

Against this background the future role of nuclear power was a key issue for the Energy Review in 2001. The review was established by a Prime Minister widely known to be pro-nuclear and its Steering Group chaired by an Energy Minister, Brian Wilson, who was openly a strong advocate of nuclear power. There were widespread expectations that the Review would call for a revival of the UK nuclear industry and press allegations that Wilson was seeking to influence the analysis of the review improperly to that end (e.g. Edwards, 2001).

In the event, the Review produced detailed evidence showing that nuclear power was unlikely to be an economic option for carbon abatement. It rejected the nuclear industry's argument that new nuclear power would be needed as older nuclear stations closed. Most importantly given the 50 year history of state subsidy, it rejected continued public support of nuclear power in favour of more aggressive support for energy efficiency and renewable energy. The implicit recognition was that major nuclear programmes deter investment in sustainable alternatives, including energy efficiency.

The need for Government subsidy to prevent the collapse into bankruptcy of the main nuclear generator, British Energy, in September 2002 confirmed the concerns about the economic of the nuclear sector. It is possible that the rejection of the nuclear industry's case by the Energy Review damaged investor confidence. However, it is clear that investor confidence in the economics of nuclear new build was unlikely to be forthcoming in a liberalised market where nuclear stations were unprofitable to operate even with the whole of their capital costs written off.

## **Energy Efficiency in the Energy White Paper**

### **THE BACKGROUND**

The announcement of a further round of public consultation on energy policy, leading to a new Energy White Paper, was made in May 2002. The White Paper was designed to respond to the recommendations of the Royal Commission on Environmental Pollution and of the Energy Review.

The climate for positive proposals for energy efficiency was good. The analytical work to assess the potential for energy efficiency improvement had existed for many years and was now firmly recorded in Government reports. Understanding of the constraints to energy efficiency had improved and the ideological environment of non-intervention that prevented Government intervention in earlier years had significantly weakened. Whilst the Government remained committed to a liberalised energy market, it had shown a greater tendency to intervene to secure specific social and environmental goals. New energy legislation (the Utilities Act) provided the powers to do this and some new policy measures had already been implemented, notably a major increase in the scale of the Energy Efficiency Commitment from April 2000, and were beginning to work without economic disruption or political unpopularity.

More importantly, as set out in earlier sections, the need for change in energy policy was more widely recognised. Climate change was high on the Government's own political agenda with a challenging target for carbon emissions reduction in place. And the main conventional low carbon alternative – nuclear power – was in financial trouble. Although institutional responsibility for energy efficiency still rested outside the Government department responsible for energy policy, the potential role of energy efficiency in energy policy was now understood.

### **THE ANALYSIS**

The analytical work on energy efficiency of the team that wrote the Energy White Paper built upon previous official work rather than replaced it. In particular, the same inter-departmental group of analysts that informed the Energy Review continued to support work on the White Paper. The importance of energy efficiency as a carbon abatement tool in the medium term is amply exemplified by the figure below.

### **THE POLITICS**

Although the analysis and drafting work on the Energy White Paper was undertaken by Government officials, final decisions on the content, especially the strength and tone, of

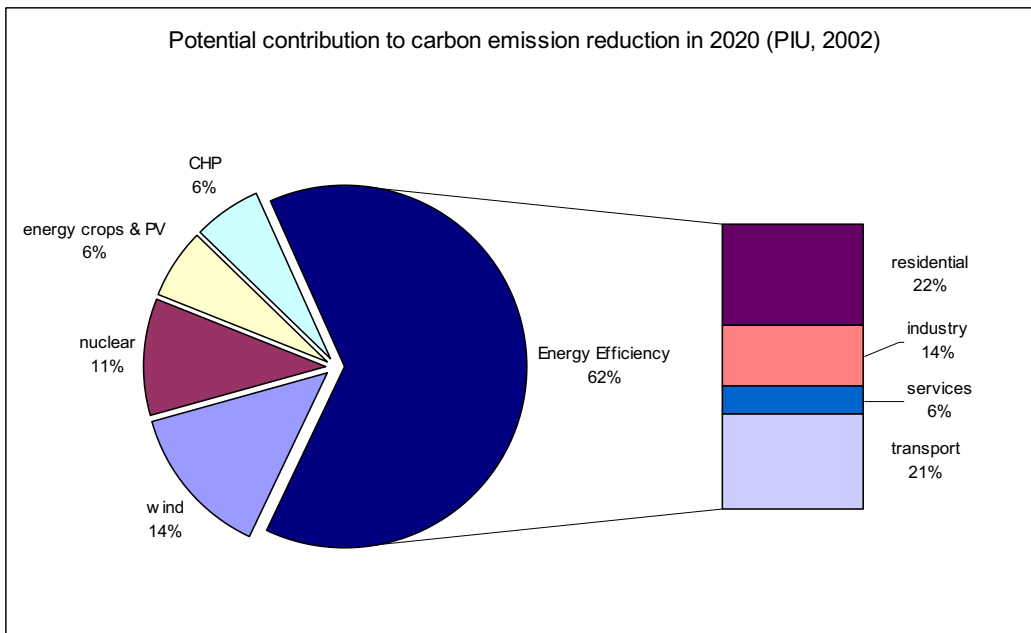


Figure 1.

the recommendations rested with Government ministers. Both of the key Government Departments (Department of Trade and Industry, and Department of the Environment, Food and Rural Affairs) were led by Secretaries of State (Patricia Hewitt and Margaret Beckett respectively) who were inclined to be supportive of environmental policies. Whilst neither could be described as an environmental radical, both had a track record of supporting environmental policy and neither had strong links to vested interests in energy supply. The Finance Ministry (Her Majesty’s Treasury) had been closely involved in the preparatory work and understood that there were no major implications for public spending. And crucially, the Prime Minister, although not necessarily supportive of the detail, favoured the UK being seen to take a strong stance on climate change.

**THE OUTCOME**

The result was that the Energy White Paper was unambiguous in its support for strong action on energy efficiency and renewable energy, and in its rejection of new nuclear construction in the short term. The White Paper was intended to be a general statement of policy rather than a detailed blueprint. There was some criticism of a lack of specific new measures. Certainly some of the specific proposals of the Energy Review, notably for sector specific targets, were not adopted. On the other hand, in some areas the White Paper did make new commitments, for example to enforce use of condensing boilers through Building Regulations and to increase energy supplier obligations. In addition, the White Paper committed the UK to support for an EU emissions trading scheme.

The support for renewable energy has been the focus of much of the commentary on the Energy White Paper. And there should be no doubt that a commitment to deliver significant amounts of energy from renewables is a huge policy shift. But the analysis shows that for the next 20 years at

least, energy efficiency improvements will need to be the centrepiece of the UK’s move towards a low carbon economy. The key outcome for energy efficiency was not any specific policy change, but rather the clear commitment to major carbon emissions reductions with a recognition (paragraph 1.40) that “the cheapest, cleanest and safest way of addressing all of our goals is to use less energy. We have to improve energy efficiency far more in the next 20 years than the last 20”.

**Delivery of the Energy White Paper Goals**

**THE ENERGY EFFICIENCY ACTION PLAN**

The Energy White Paper is far from the last word on UK energy efficiency policy. This was recognised at the time of publication through the commitment to bring forward a more detailed Energy Efficiency Implementation Plan with a year. In the event this plan, renamed the Energy Efficiency Action Plan, was published in March 2004 (Defra, 2004a). It contained no great surprises – largely bringing together the information and commitments on policy instruments that are currently in place or planned.

**WHERE NEXT FOR ENERGY EFFICIENCY POLICY?**

Even the Action Plan is not the end of the process. The UK Climate Change Programme is being reviewed in 2005. It is clear that delivery of the goal of reducing carbon emissions by 20% by 2010 will need new policies to be put in place. So the Government is taking the opportunity to conduct an Energy Efficiency Innovation Review at the same time to look again at some of policy options. The outcomes of these reviews are not yet known. However, it is already clear that existing policies have some weaknesses.

Whilst strong incentives are in place for energy intensive industries (Climate Change Agreements and the EU Emis-

sions Trading Scheme) and for households (the Energy Efficiency Commitment), there is no equivalent policy instrument in the SME, commercial sector or for light industry (Wade and Leach, 2003). It seems likely that Government will want to investigate extending the number of Climate Change Agreements and/or broadening supplier obligations to cover other sectors.

In the household sector the strong push through regulation of products, buildings and energy supplier obligations is reaching the point where it is constrained by consumer awareness and action. Whilst a strong regulatory framework is critical it cannot deliver alone. Energy suppliers report that they are finding promotion of basic energy saving measures, notably cavity wall insulation, increasingly difficult. Awareness of the links between energy use and climate issues in the UK population remains limited. Without increased awareness, this problem is likely to persist. A more sustained campaign, focussing on local advice and projects, will be needed.

It is also clear that there will need to be an increased focus on the transport sector. Whilst the EU-wide system of voluntary agreements with European and Asian car manufacturers is certainly improving energy efficiency, the signs in the UK are that the pace of improvement is declining (EST, 2004). Greater attention to consumer information, advice and support as well as fiscal incentives is needed in this sector as well.

## Conclusions

The Energy White Paper marks a major step forward for UK energy efficiency policy. Whilst not perfect, it provides the framework for future action.

The strong emphasis on energy efficiency in the Energy White Paper did not arise by accident. It required a major shift in energy policy from the supply dominated policy of early years.

Initial claims that major energy efficiency improvements could be achieved cost effectively were initially rejected by the policy establishment. They were only accepted after repeated analyses, including those based on the Government's own programmes, made the conclusion unavoidable.

The breakdown of the monolithic institutions of energy supply in energy market reform provided an institutional structure in which demand side action could be considered. But the interventions needed to promote energy efficiency could not be undertaken whilst a strong free market ideology persisted.

Only the development of climate change as a key issue for energy policy allowed energy efficiency policy to move to centre stage. The long lead times for development of a major renewable energy industry, and the acceptance that nuclear power is uneconomic, made a supply side dominated solution implausible. Even then, the strong regulatory interventions needed to deliver energy efficiency needed to be demonstrated in action, as effective and acceptable, to allow the potential of energy efficiency to be accepted.

## References

- Boyle, S. (1996) DSM Progress and Lessons in the Global Context. *Energy Policy* 24(4) 345-360.
- Cebon, P.B. (1992) Twixt Cup and Lip - Organisational Behaviour, Technical Prediction and Conservation Practice. *Energy Policy* 20 802-814.
- Chapman, P.J. (1975) *Fuel's Paradise*. Pelican Books, 1975, London.
- de Canio, S.J. (1993) Barriers within Firms to Energy Efficient Investments. *Energy Policy* 21 906-914.
- Currie, W.M. (1989) Options for Mitigating the Greenhouse Effect. ETSU R 54. HMSO.
- Defra (2004a) Energy Efficiency - The Government's Plan for Action. [www.official-documents.co.uk/document/cm61/6168/6168.htm](http://www.official-documents.co.uk/document/cm61/6168/6168.htm)
- Defra (2004b) Consultation on the Review of the UK Climate Change Programme. [www.defra.gov.uk/corporate/consult/ukcep-review/index.htm](http://www.defra.gov.uk/corporate/consult/ukcep-review/index.htm)
- Department of Energy (1984) Energy Use and Energy Efficiency in UK Manufacturing Industry up to the Year 2000. Energy Efficiency Series, Number 3. HMSO.
- Department of Energy (1988) Energy Use and Energy Efficiency in UK Commercial and Public Buildings up to the Year 2000. Energy Efficiency Series, Number 6. HMSO.
- Department of Energy (1989a) Energy Use and Energy Efficiency in the UK Domestic Sector up to the Year 2010. Energy Efficiency Series, Number 11. HMSO.
- Department of Energy (1989b) Energy Use and Energy Efficiency in UK Transport up to the Year 2010. Energy Efficiency Series, Number 10. HMSO.
- Department of Energy (1989c) An Evaluation of Energy related Greenhouse Gas Emissions and Measure to Ameliorate them. Energy Paper 58. HMSO.
- Department of Trade and Industry (2003) Energy White Paper. Our energy future – creating a low carbon economy. Cm 5761. [www.dti.gov.uk/energy/whitepaper/ourenergyfuture.pdf](http://www.dti.gov.uk/energy/whitepaper/ourenergyfuture.pdf)
- DETR (2000) Department for the Environment, Transport and Regions. Climate Change: The UK Programme. <http://www.defra.gov.uk/environment/climatechange/cm4913/index.htm#docs>
- Edwards, R. (2001) Energy review blows out nuclear power in favour of wind and waves. Sunday Herald, 9<sup>th</sup> December 2001, Glasgow.
- EST (2004) Energy Saving Trust and Institute for European Environmental Policy. Passenger Cars: CO2 Emissions and Vehicle Excise Duty.
- European Commission (2002) Directive 2002/91/EC of the European Parliament and of the Council on the Energy Performance of Buildings.
- European Commission (2003a) Proposal for a Directive of the European Parliament and of the Council On establishing a framework for the setting of Eco-design requirements for Energy-Using Products and amending Council Directive 92/42/EEC. COM/2003/0453 final.
- European Commission (2003b) Proposal for a Directive of the European Parliament and of the Council on energy end-use efficiency and energy services. COM/2003/0739 final.



- Eyre (1997a) Taking a Cool Look – Policies to Reduce UK CO<sub>2</sub> Emissions by 20%. SERA, London.
- Eyre (1997b) Barriers to Energy Efficiency: More than Just Market Failure. *Energy and Environment* 8 (1) 25-43, 1997.
- Foley, G. and Nassim, C. (1981) *The Energy Question* (2nd ed), Penguin Books, London.
- Goldsmith, E. and Allan, R. (1972) *A Blueprint for Survival. The Ecologist*.
- Grubb, M.J. (1991) Energy Policies and the Greenhouse Effect. Volume 2 Chapter 5.. Royal Institute of International Affairs. Dartmouth, London.
- Hirst, E., Cavanagh, R. and Miller, P. (1996) The Future of DSM in an Restructured US Electricity Industry. *Energy Policy* 24 (4) 303-316.
- Katzev, R. and Johnson, T. (1987) *Promoting Energy Conservation: An Analysis of Behavioural Research*. Westview Press, Boulder.
- Kempton, W. and Layne, L.L. (1994) The Consumer's Energy Analysis Environment. *Energy Policy* 22 (10) 857-866.
- Komor, P.S. and Wiggins, L.L. (1988) Predicting Conservation Choice: beyond Cost Minimisation Assumptions. *Energy* 13 (8) 633-645.
- Koomey, J.G. and Sanstad, A.H. (1994) Technical Evidence for Assessing the Performance of Markets affecting Energy Efficiency. *Energy Policy* 22 (10) 826-832.
- Krause, F., Bach, W. and Koomey, J. (1989) *Energy Policy in the Greenhouse*. International Project for Sustainable Energy Paths, El Cerrito.
- Lazarus, M. (1993) *Towards a Fossil Free Energy Future. The Next Energy Transition*. Stockholm Environment Centre, Boston.
- Leach, G. (1979) *A Low Energy Strategy for the United Kingdom*. Science Reviews Ltd, London.
- Leach, M. Fouquet, R., Hart, D., Pearson, P. Curzon Price, T. and Wade, J. (1997) *A Realistic Strategy for Reducing Greenhouse Gas Emissions in the Period 2000-2010 Using Improvements in Energy End-Use Efficiency*. Electricity Association.
- Lovins, A.B. (1977) *Soft Energy Paths – Towards a Durable Peace*. Pelican Books, London.
- Lutzenhiser, L. (1993) Social and Behavioural Aspects of Energy Use. *Annual Review of Energy and Environment* 18 247-289.
- Meadows, D.H., Meadows, D. L., Randers, J. and Behrens, W.W. (1972) *The Limits to Growth*. Club of Rome.
- Meier, A. (2004) Evidence to the House of Lords' Select Committee on Science and Technology, 19<sup>th</sup> October 2004.
- National Audit Office (1998) *The Office of Electricity Regulation: Improving Energy Efficiency Financed by a Charge on Customers*.
- National Audit Office (2004) *Ofgem – Social Action Plan and Household Energy Efficiency*
- ODPM (2004) Office of the Deputy Prime Minister. Proposals for Amending Part L of the Building Regulations. [www.odpm.gov.uk/stellent/groups/odpm\\_control/documents/contentservertemplate/odpm\\_index.hcst?n=192&l=2](http://www.odpm.gov.uk/stellent/groups/odpm_control/documents/contentservertemplate/odpm_index.hcst?n=192&l=2)
- PIU (2002) Performance and Innovation Unit, Cabinet Office. *The Energy Review*. [www.strategy.gov.uk/output/Page3703.asp](http://www.strategy.gov.uk/output/Page3703.asp)
- RCEP (2000) Royal Commission on Environmental Pollution 22<sup>nd</sup> Report. Energy – the Changing Climate. <http://www.rcep.org.uk/newenergy.htm>
- Sanstad, A.H. and Howarth, R.B (1994) "Normal" Markets, Market Imperfections and Energy Efficiency. *Energy Policy* 22 (10) 811-818.
- Smith, A.C. and Marsh, G.P. (1997) *CO<sub>2</sub> Reduction Policy Options: An ETSU Viewpoint*. ETSU, Harwell.
- Tabet, J.-P. (2003) *A New Energy Efficiency Measure: The White Certificates Scheme*. World Energy Council Workshop, Paris. [www.worldenergy.org/wec-geis/global/downloads/cepi04/WS1203tabet.pdf](http://www.worldenergy.org/wec-geis/global/downloads/cepi04/WS1203tabet.pdf).
- Wade, J. and Leach, M. (2003) *Energy Efficiency in UK Energy Policy: a step change towards a low carbon economy*. Proceeding of the European Council for an Energy Efficient Economy Summer School.

### Acknowledgements

The authors acknowledge insights provided over many years by colleagues at the Energy Saving Trust and within the teams responsible for production of the UK Energy Review and the UK Energy White Paper. We are grateful for helpful comments by anonymous reviewers. The authors alone are responsible for the analysis and views set out in this paper.