

Economic Development Committee EDC 03-02(p3)

Date : 30 January 2002

Time : 14.00 - 17.30

Venue : Committee Room 3, National Assembly Building, Cardiff Bay

Title : ENERGY EFFICIENCY IN THE NON-DOMESTIC SECTOR - PAPER FROM THE CARBON TRUST

This paper has been prepared at the request of the National Assembly for Wales to assist the Economic Development Committee's review of energy/energy efficiency. It covers energy use and efficiency in the non-domestic sectors (ie private and public but excluding public transport) and complements papers from the Energy Saving Trust and the Environment Agency.

The Carbon Trust is an independent, not for profit company set up by Government and the Devolved Administrations with support from the business community to take the lead in low carbon technology innovation and put the UK in the lead internationally. It stands ready to provide further information and assistance if that would be useful to the EDC and its review.

1. Introduction and context

1.1 Energy availability and use are essential parts of modern life. Its reliable supply, from diverse sources, at low prices and in ways which are sustainable and secure, is a primary objective of the UK Government's energy policy. Efficient use of energy is also part of the Government's policy for three reasons:

- i. reducing energy waste helps improve business competitiveness and releases money to target on core activities in the public sector;
- ii. it is a "no-regrets" means of helping to achieve the UK's greenhouse gas reduction targets and climate change policy objectives; and
- iii. it helps reduce energy demand and therefore reduces dependency on imported energy sources.

1.2 The total annual energy consumption for the UK is about 1,860 TWh, worth about £70Bn pa. Consumption in Wales is about 5% of the total for the UK – ie 93 TWh, and worth about £3.5Bn. Work has been commissioned to obtain a sector by sector picture of energy use across Wales. Meanwhile, the cost-effective potential for energy efficiency savings is estimated to be about 20% - more in some sectors and individual companies/organisations and less in others. Much of this can be achieved cost-effectively with existing knowledge and technologies. But, the full potential has not been, and is not being, achieved. It is estimated that the full technical potential for energy efficiency savings is around 35%.

1.3 The need to improve energy efficiency has been given added impetus because of the climate change imperative to cut greenhouse gas emissions. The Government already has a target to cut CO₂ emissions by 20% by 2010 on 1990 levels – significantly beyond the UK's Kyoto obligation. Furthermore, The Royal Commission on Environmental Pollution in its June 2000 report "Energy – The Changing Climate" recommended that the UK should aim to reduce its CO₂ emissions by 60% by 2050 in order to stabilise greenhouse gas emissions at twice pre-industrial levels which, on current knowledge, would avoid the worst impacts of climate change. The Government has not yet reached a view on whether to adopt the RCEP figure as a CO₂ reduction target but if it choose to do so it would require a step change in the role and delivery of energy efficiency, a step change in the reduction in carbon intensity of energy supply, and a step change in behaviour of all consumers.

1.4 This paper sets out: (a) the scope for energy savings in the non-domestic sectors; (b) the barriers to energy efficiency; (c) the current range of energy efficiency programmes relevant to non-domestic energy users; and (d) next steps for energy efficiency action in Wales to help reduce energy bills and also deliver the Government's current CO₂ target. (It does not consider what programmes and policies would be required to make adequate progress towards the 60% CO₂ reduction by 2050 recommended

by the RCEP. It also does not address energy use and the potential for energy and carbon savings in the transport sector. There are programmes and activities under the Energy Saving Trust and the Energy Efficiency Best Practice programme respectively. These are funded mainly by the Department of Transport, Local Government and the Regions.)

2. The scope for energy savings in the non-domestic sectors

2.1 Although the particular mix of energy consumption in industry, commerce, the domestic and public sectors, and transport for Wales is different from that of the UK as a whole, the scope for energy savings in each of those respective sectors will be similar. Thus, for example, in the buildings sector replacing old, inefficient lighting with low energy lamps, fittings and controls could pay for itself in around 1-3 years, depending on how inefficient the old lighting was. The following tables/diagrams, drawn from interim results from the sectoral energy study for Wales (referred to in paragraph 1.2 above), show the main buildings energy using sectors and the potential for savings across the main energy end uses (heating, lighting, cooling, office equipment, etc.)



The distribution of cost effective carbon savings by sector for the non-domestic buildings sector in Wales

The distribution of cost effective carbon savings by source for the non-domestic buildings sector in Wales

Sources of cost effective carbon savings by sector for non-domestic buildings in Wales

Breakdown of cost effective savings by source for each sector

The above figures also assume Wales accounts for 5% of the totals for the UK. The cost effective savings depicted are based on discounted cash flow calculations using a 6% discount rate. The carbon emission reductions shown for each end use are independent of each other and do not take account of interactions between different types of measures such as replacing boilers and installing more effective controls. Nor do they take into account the interactions between measures, such as greater heating demand resulting from more efficient appliances. They do, however exclude alternative options by including only the option that gave the greatest cost-effective potential for reducing carbon. If all cost-effective measures were carried out the savings are estimated to be around 75% of that for the individual measures.

2.2 The main energy saving opportunities lie in cutting consumption in the following energy end uses:

- i. in non-domestic buildings: heating, lighting, ventilation, air-conditioning, controls and energy management;
- ii. in manufacturing and process industries: specific process related savings in, for example, drying, heat transfer in high temperature processes and improved burner technology; and cross-sectoral utilities such as, for example, electric motors and drives, compressed air, refrigeration and controls, and energy management.

There are many examples of real life energy savings projects drawn from independently monitored case studies supported under the Energy Efficiency Best Practice programme. The programme started in 1989 and, by the end of 2000, had stimulated savings worth £800M pa compared with 1990 energy consumption. Best Practice is the Government's premier energy efficiency information and R&D programme. It is currently being restructured and transferred from the Department for Environment, Food and Rural Affairs to The Carbon Trust.

2.3 However, these savings opportunities are not being realised on anything like their full economic potential. The reasons are partly to do with behaviour and partly to do with market failure.

3. The main barriers to energy efficiency

I Weak energy price signals

3.1 For most organisations, energy consumption represents a very small percentage of operating costs – sometimes 1% or less – and therefore does not command attention at Board level. Generally, only companies in the energy intensive sectors such as steel, aluminium, chemicals etc take energy use and efficiency seriously because for them savings in energy use can mean the difference between being competitive and not competitive in the global markets in which they operate. But even for these companies, budgetary constraints limit the number of worthwhile energy efficiency opportunities they can take up.

3.2 Similarly, for many non-energy intensive organisations, energy efficiency does not feature as part of good management even though energy efficiency investments are often straightforward and low risk compared with much core investment. For many organisations, energy use and energy efficiency simply do not figure in the management of controllable costs even though some energy savings can be achieved for little outlay. In other words, the price signal is weak.

3.3 The climate change levy introduced in April 2001 sends a signal that the use of energy carries an environmental cost. The levy ensures that that cost is now beginning to be "internalised" so that investment decisions can begin to take the environmental cost (in this case the impact of climate change) into account. Energy intensive companies meeting the qualifying criterion have been offered the opportunity to enter into sectoral climate change agreements with Government whereby companies receive an 80% reduction in the rate of levy provided they meet agreed energy saving targets. Many companies have taken up this offer.

II Short term investment horizons in the private sector

3.4 So far as contributing towards the UK's CO₂ reduction targets is concerned, there is a mismatch between the 25-30% rate of return which tends to governs private sector investment decisions and the 6% "national interest" discount rate used to rank investment for the public good. At 25-30% only the short term energy efficiency opportunities will be considered and even then may not be implemented if there are competing core investment opportunities showing comparable returns. Longer term, but nevertheless worthwhile, energy efficiency investment needed to help meet our CO₂ reduction targets simply will not go ahead at the usual rates of return used to rank private sector investment opportunities. Under these investment criteria, the price signal, even with the climate change levy, is insufficient to improve the ranking of these energy efficiency opportunities.

III Capital/revenue budget compartmentalisation in the public sector

3.5 Energy purchases are made from revenue budgets whereas any energy efficiency measure which does not pay for itself in under a year would have to be considered for funding from the capital budget. Even though these longer term measures would payback in 3, 5, 7 years and reduce energy running costs, they have to take their place in the investment "queue" and often a combination of higher core priorities and budget limits squeeze energy efficiency investments out. Public private partnerships can offer a way round this compartmentalisation barrier, provided energy efficiency is properly included in the project specification.

IV Too few organisations motivated to find out what to do to improve their energy efficiency

3.6 Despite the efforts of the Energy Efficiency Best Practice programme for over 10 years, supported by colleagues in the Devolved Administrations and the English Regions, too few organisations bother to ask what to do to improve energy efficiency. The gathering and targeted dissemination of independent, authoritative information on energy efficiency performance and savings measures is one of the key elements of Energy Efficiency Best Practice. It helps to get organisations started on the energy efficiency road. However, too few organisations are sufficiently motivated to look for the information. The introduction of "Action Energy", as part of Energy Efficiency Best Practice, provides site specific advice to thousands of organisations per year – by telephone and by site visit as appropriate. But in the context of around 3.7M companies across the UK (3.2M of which employ four people or less), over 30,000 schools, over 2000 hospitals and several hundred local etc authorities, the scale of activity needs to be geared up if the full potential for energy savings is to be realised.

V The "hassle" factor to get energy efficiency projects specified, implemented, commissioned and managed in use.

3.7 Partly because energy efficiency is not a high priority for the vast majority of end users (and as a result, the procurement procedures in place are not well tuned to energy

efficiency projects), and partly because of the small and fragmented nature of many of the energy efficiency goods and service providers, the specification, implementation and commissioning of energy efficiency projects is not straightforward. End users have to approach a number of organisations at each step in the process and manage the interactions as best they can. The concept of a turnkey operation is insufficiently well developed for many energy efficiency projects compared with some other project areas. The consequence is that many worthwhile energy efficiency ideas are not progressed to their conclusion – or sometimes not even started in the first place.

VI Insufficient numbers of skilled energy efficiency professionals

3.8 The energy efficiency goods and services sector supports some training but in practice there are not the number of trained people on the scale needed to maximise energy and carbon savings. In order to improve energy efficiency on that scale more, and better trained, people are required across the range from graduates to fitters.

3.9 Similarly, there are insufficient numbers of trained, or even energy efficiency aware, staff in organisations across the public and private sectors.

4. The current range of energy efficiency programmes for the non-domestic sectors

4.1 The Energy Efficiency Best Practice programme, has since 1989, been the UK's premier energy efficiency programme. It is UK wide but with packages specified by and prepared at the request of the respective Devolved Administrations. The programme elements currently include: independent generic advice for energy professionals on a wide range of energy efficiency measures; site specific advice for individual organisations; subject specific seminars and workshops; and calls for proposals for R&D feasibility studies. The site specific advice element is being significantly expanded in 2002 as part of the restructuring of the programme. As part of the transfer of the non-domestic component of Best Practice from Department for Environment, Food and Rural Affairs to The Carbon Trust, the programme elements will be re-prioritised to reflect market needs and the results of research into market segmentation due in May/June this year. (The domestic component of Best Practice is in the process of being transferred to the Energy Saving Trust.) The Best Practice knowledge base, which provides technical underpinning across this and other programmes, is strong and comprehensive. It is widely recognised here and abroad as a major national resource of independent, authoritative energy efficiency information.

4.2 The Enhanced Capital Allowances scheme, which started in April 2001 and is funded from the climate change levy, provides 100% first year tax allowances for companies investing in qualifying energy efficiency technologies. The ECA's Energy Technology List contains over 2000 products and the list is expected to grow in 2002 to cover new generic technologies including renewables under the Green Technology Challenge initiative announced by the Government last November.

4.3 The provision of grants and loans are ways in which longer term investments in the national interest can be encouraged and both Scotland and Northern Ireland have schemes underway. The Carbon Trust is currently developing ideas for a loan scheme for England and Wales, building on the experiences in Scotland and Northern Ireland.

4.4 The Government and the Devolved Administrations, supported by the business community, set up The Carbon Trust to take the lead in low carbon technology innovation and put the UK in the lead internationally. It is funded partly from DEFRA and the Devolved Administrations, and partly from recycled climate change levy receipts. The Carbon Trust is the lead delivery organisation for accelerating the deployment of existing energy efficiency technologies in the non-domestic sectors; and for supporting the innovation process to bring new and emerging low carbon technologies to market. The Carbon Trust published its strategy in November 2001. The analysis, based on current knowledge, concluded that energy efficiency has an important role to play to help the UK move towards a low carbon economy – a view held by other informed groups working in this area.

5. Next Steps

5.1 The Carbon Trust is currently working with the Devolved Administrations, the English Regions and business to prepare programmes to achieve energy efficiency improvements and carbon savings. Each of its programmes will seek to assess and address or inform policy makers on the main barriers to energy efficiency as outlined in section 3 above.

5.2 The Carbon Trust is developing programmes across three broad theme areas:

- i. **accelerating the deployment of existing energy efficiency measures** through Energy Efficiency Best Practice, the enhanced capital allowances scheme, Action Energy site specific advice, and a UK wide energy efficiency incentive scheme under development featuring grants and/or loans for approved energy efficiency projects;
- ii. **stimulating and supporting the development and market take-up of new and emerging low carbon technologies** through a mix of finance and support mechanisms under development – working title is the Low Carbon Innovation Programme;
- iii. **helping to take forward the low carbon debate**, improve understanding of the complex issues and help inform policy.

6. Action in Wales

Information and advice

6.1 Historically, business support on energy efficiency has been provided by the National Assembly for Wales' Business and Environment Branch. In order to enhance local delivery, the National Assembly, formerly the Welsh Office, appointed 3 part time energy advisors, one of whom had specific responsibility for co-ordinating and improving the effectiveness of the Energy Efficiency Best Practice Programme in Wales (EEBPP). The local co-ordinator appointment was a Welsh initiative and through working closely with the EEBPP, a tailor made work programme, designed to respond to the specific energy needs of Welsh energy users, has been delivered to great affect. In addition, the energy advisors have made significant progress in raising the profile of energy efficiency in the region. On average over the last five years, approximately 200 visits per year have been made, providing additional advice and support to businesses and the public sector In recognition of the need to support businesses at different levels, the NAW Business & Environment Challenge Scheme (BECS) have funded the development of a software package for energy efficiency signposting for accountants. There are plans to roll out this Welsh initiative across the UK. This work has provided a strong foundation upon which the Carbon Trust in Wales can build.

The Carbon Trust in Wales (CTW)

6.2 The Carbon Trust has recently established a national presence in Wales. The manager for CTW was appointed at the beginning of January and a small team is to be recruited, focusing on local delivery. Three Regional Client Managers are to be appointed covering the whole of Wales to proactively promote the services of The Carbon Trust and help ensure take up of advice provided. Work is in hand to tailor an energy efficiency and low carbon programme for Wales, drawing on existing and developing programmes at The Carbon Trust. Key performance measures will be drawn up for the CTW to include, eg cost reductions and carbon emissions per £ invested.

6.3 The EEBPP is an integral part of the service delivery programme for Wales and it has been agreed, in principle, to top up this year's EEBPP funding in Wales (£1m) with £400k from climate change levy (CCL) receipts, in recognition of the value of the programme to Welsh energy users. This additional funding has provided further assistance with CCL advice and information, extra energy audits and site visits, a significantly larger event programme and an emphasis on providing extra transport advice and audits. This emphasis is in line with the customer service approach in the EEBPP and being developed by CTW.

6.4 The study into energy use and carbon emissions in Wales to target and prioritise

focus of the Trust's work and efforts in Wales is currently underway. The data arising, together with information contained within past Energy Advisor reports, will identify the major energy saving opportunities and signpost the priorities for The Carbon Trust.

6.5 Wales has a high percentage of SMEs and it is intended to develop marketing strategies to reach and help them. In this context, for example, The Carbon Trust, working in partnership with the Energy Saving Trust, is developing a SMEs help and advice scheme, building on the existing Energy and Environment Helpline and the EST's network of energy efficiency advice centres which will be enhanced specifically to help the very small SMEs with "domestic" style energy use characteristics.

6.6 Larger SMEs, and other businesses, will be helped by the range of information and advice services available through the EEBPP's Action Energy scheme including extended technical advice via the Energy and Environment Helpline and, where appropriate, site energy assessments (SEA). The emphasis will be on using local sources of

expertise and local delivery. In particular, the Action Energy SEA Consultant Accreditation scheme will be promoted to recruit and enhance the Welsh energy efficiency consultants' base. Where indigenous skills / services are unavailable (e.g. specialist technical advisers), these will be sourced from other parts of the UK. Previous company site energy assessment reports will be reviewed and companies will be contacted to see whether further assistance is required in delivering recommendations previously made. Recommendations for action will be reviewed collectively to ensure that the new BPP is targeted at areas where there is most need.

6.7 CTW will be assessing the scope to build partnerships with local organisations and networks including Arena Network's Business & Environment Coordinators and the Groundwork Trust. CTW will seek to encourage Arena to promote Carbon Trust schemes and will provide a capability to follow through on relevant visits carried out under Arena Network auspices. Regional Client Managers will also promote their work on visits that they do direct to companies. CTW will seek to form strategic partnerships with the Welsh Tourist Board to promote energy efficiency in hotel and leisure industry and with the Royal School of Architects to raise awareness of design advice. CTW will also work with other organisations to provide a coordinated point of contact for energy efficiency and carbon savings initiatives for the public and private sectors in Wales. In addition CTW will explore the opportunities to gear resources, for example, European Union Funds

6.8 Furthermore, CTW will assess the potential to work with Groundwork Trust and Neath Port Talbot County Council on a proposed Incubator /Technium centre for sustainable development / technologies.

Fiscal incentive scheme

6.9 The Enhanced Capital Allowances scheme is a UK wide scheme which offers 100% first year capital allowances to companies investing in qualifying energy efficiency technologies. Awareness is not as universal as had been hoped and therefore a new programme is being set up to promote and generally develop the scheme. Specifically in Wales, targeted Welsh marketing initiatives will be set up to: (a) raise awareness and explain to company managements how ECAs and energy efficiency can help their businesses control and manage energy costs; and (b) work with equipment manufacturers who would like to get their qualifying products on to the ECA Energy Technology List.

Finance assistance schemes to encourage take up of existing energy efficiency projects

6.10 Energy efficiency loan schemes are operating in Northern Ireland and Scotland. The Carbon Trust, in consultation with the English regions and the NAW, is developing plans for similar schemes to cover England and Wales with the aim to have a scheme up and running by April 2002. Specific consideration will be given to sectors such as tourism and agriculture following successful take up of the loan scheme in N. Ireland by these industries.

Low Carbon Innovation Programme (LCIP)

6.11 The aims and objectives of the Low Carbon Innovation Programme (LCIP) are: to encourage innovation, research, new processes and practices; and to identify and address barriers and market failures which are holding back the development of a 'low carbon' economy. LCIP is designed to provide a funding continuum across the innovation process, and to operate in a responsive and flexible manner. It will be designed to accommodate a wide range of projects from blue-sky research to near-market technology which has not yet achieved "critical mass" in the marketplace. A spectrum of financial instruments, from grants, guarantees and loans, to equity, convertible debt, and carbon-linked instruments, will be tailored to meet specific needs and different stages of the "innovation process". The four main strands to the delivery of LCIP are: research and development; demonstration projects; carbon finance (seed capital and venture capital); and market diffusion, including training and education programmes to ensure that the deployment of new equipment is effective. LCIP will work collaboratively with the business and research communities to strengthen links between the two and ensure the most appropriate innovation routes are pursued.

6.12 Specifically for Wales, a major Objective 1 bid is being developed in partnership with WDA and United Utilities Energy Services (UUES) to secure £3M funding to co-fund the capital cost of new energy efficient/low carbon equipment, thereby improving SME competitiveness and helping to meet CO₂ targets. Private sector leveraging for £5M has been agreed.

Public sector

6.13 The public sector is a significant sector and energy user in Wales and CTW, through the EEBPP and Action Energy will continue to provide information and advice to managers in local authorities, schools, hospitals and leisure facilities. CTW wishes to explore how to work with the three Local Authority based energy agencies in Wales.

Additionally, the scope to make more use of energy service companies to work with public sector organisations will be explored as part of a wider energy services initiative being discussed with the Energy Saving Trust.

7. Further information

7.1 The Carbon Trust stands ready to provide further information on energy efficiency in the non-domestic sectors if that would be useful to the EDC and its review.

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January 2002