The Carbon Trust's Carbon Management Program: Description and Evaluation of Pilot Phase Results

Andrew Wordsworth, The Carbon Trust
Robert Kwartin, ICF Consulting
Abyd Karmali, ICF Consulting

ABSTRACT

The Carbon Trust launched an innovative Carbon Management program in October 2003 to accelerate and optimize the UK's progress towards a less carbon-intensive economy. Perhaps the most striking difference between the Carbon Management program and its analogs elsewhere is its focus on corporate change management, with an emphasis on catalyzing senior executives to integrate the opportunities and risks related to climate change mitigation into their core business strategy. The program has no technology focus, nor is it restricted to a particular emission source (such as energy) or site. Rather, the program seeks to influence corporate decision-making by driving each participant through a 5-stage process of evaluating corporate exposure to carbon-related risks, identifying and assigning priority to risk-mitigation actions, developing an implementation plan, and taking specific actions. To support participants, the Carbon Trust provides a set of analytical tools tied to the 5-step process, as well as £50,000 (~$92,000) of management consulting support per participant to assist in the evaluation and change management processes. The key metrics for the pilot evaluation include: participants' progress in following the 5-step change management process; the level of engagement by senior managers at participating companies; the magnitude of emission reduction actions that win management support; the extent to which companies benefit from the consultants and tools provided by the Carbon Trust; the extent to which carbon management yields incremental results beyond a narrower focus on energy efficiency; cost-effectiveness; and, the extent to which carbon management has become embedded into day-to-day corporate decision-making.

Introduction

Energy Efficiency Programs in the UK

The advent of a far-reaching climate policy the late 1990s brought renewed attention to energy-efficiency programs. It was understood that energy efficiency actions would need to deliver up to half of all GHG emission reductions required to fulfill the UK's reduction goals (the balance resulting from cleaner energy supplies). A strategic shift in corporate behavior was clearly needed. The concern, however, was that the legacy energy efficiency programs were limited by their inability to engage with business at strategic levels. With energy efficiency confined to the facilities or operations departments, it was a constant struggle to gain and retain commitment to improving energy efficiency at many organizations. One of the key challenges, therefore, in implementing the UK's climate policy, was how to elevate energy efficiency concerns (and lower-carbon energy supplies) to the executive suite and Board levels, and to keep executive attention on how to adjust to, and potentially profit from, the emerging climate policy regime.

Climate Policy in the UK

An important feature of the UK's climate policy has been a desire to be an early leader in experimenting with new policy measures; thus, in several policy areas, the UK took action 1-3 years ahead of many (or most) of its European neighbors. The benefit of this approach has been the development of a strong policy and program toolkit for the UK, which has enabled UK businesses to learn early lessons about climate change policy and begin their adaptation to (and potential profit from) those policies ahead of their competitors in other countries. One downside of this approach has been the need to modify UK policies to bring them into harmony with later directives handed down from the EU level.

The European Union signed the Kyoto Protocol in 1998 and ratified it in 2002; a burden-sharing agreement among the EU Member States assigned the UK a greenhouse gas (GHG) emission reduction goal of 12.5% in 2008-2012 compared with 1990 levels. In addition, the UK government set its own target for CO_2 emissions at 20% below the 1990 level by 2010. Moreover, the Royal Commission on Environmental Pollution suggested that a 60% cut in greenhouse gases might be required by 2050, an aspiration accepted by the UK Government in its recent Energy White Paper. It is important to note that both the EU and the UK have stated that they intend to proceed with implementation of their Kyoto commitments and more stringent national commitments irrespective of whether the Kyoto Protocol actually enters into force.

In order to reduce emissions to meet these targets, the UK government established a policy framework to promote the implementation of energy efficient technologies and renewable energy (DETR et al., 2000). To date, the government has used the following policy and program instruments, some of which reflect the UK's approach to implementation of European Commission directives and others which are specific UK policy initiatives:

- Climate Change Levy (CCL) – a tax on fossil fuels and electricity consumed by the commercial and industrial sectors, roughly scaled to reflect greenhouse impacts. Renewably- and CHP-generated electricity is tax-exempt. Micro-businesses, transportation and residential energy consumers do not pay the tax, nor do electricity generators on their fossil fuel purchases. The tax was made revenue neutral through an offsetting reduction in social insurance taxes on businesses.
- Climate Change Agreements (CCA) – These agreements require energy intensive industries to achieve an agreed-upon reduction in GHG emissions, on either an absolute or on a per-unit-output basis. Participants receive an 80% refund of their CCL for meeting their targets.
- Energy Efficiency Commitment – requires competitive energy supply companies to invest in improving the energy efficiency of their customers' facilities.
- UK Emissions Trading Scheme – Several dozen UK organizations participate in the ETS to help fulfill explicit and absolute emission reduction targets; in addition, participants with CCA can use the UK ETS to either purchase deficit reductions or sell surplus reductions.
- Building energy efficiency regulations – By 2006, new buildings will be required to meet minimum energy performance standards, and all buildings will be required to disclose their annual energy consumption to buyers and tenants, and to perform regular energy audits.

- Enhanced Capital Allowances – allows businesses to expense 100% of their investment in energy-efficient equipment. The Carbon Trust administers the list of approved technologies.
- Action Energy - an information and advice service for businesses and the public sector, operated by The Carbon Trust. Action Energy also administers a no-interest loan program for energy efficient investments.
- The Innovation Programme from the Carbon Trust – an RD&D, innovative carbon reduction projects and venture capital investment program operated by The Carbon Trust.
- Renewables Obligation – This UK-wide program is roughly comparable to the state-level Renewable Portfolio Standards operating in the US and enables electricity generators to benefit from tradable green certificates.
- EU Emission Trading Scheme (EU ETS) – An EU-wide emission trading system will begin operation in 2005 creating the world's first international greenhouse gas emission trading system. EU Allowances (EUA) will be the carbon instrument to be traded across all 25 countries of the expanded EU. The system will cover CO_2 only in 2005-7, but will almost certainly expand to other GHGs and a wider number of sectors in the 2008-12 period. About 2,500 UK industrial (in the pulp-and-paper, ferrous metals, oil refining, and mineral materials sectors) and power-generation facilities (above 20MWt) will be required to participate in this cap-and-trade program, unless they seek an opt-out exception available to direct participants in the UK ETS and CCA signatories. Participating companies will be required to reduce their emissions or to purchase allowances from other ETS participants to cover any shortfall. Implementation of the EU ETS will require modification to the UK ETS and CCL/CCA programs.

The Carbon Trust

An independent company funded by the UK Government, The Carbon Trust was established as part of the UK's climate change program to promote the development and deployment of low carbon technologies as part of the transition to a low carbon economy. The Trust's remit covers both energy efficient technologies and low carbon energy supplies. Its goals are:

- To ensure that UK business and public sector meet ongoing targets for CO_2 emissions;
- To improve the competitiveness of UK business through resource efficiency; and
- To support the development of a UK industry sector that capitalizes on the innovation and commercial value of low carbon technologies.

The Trust has approximately 60 people based in London, with branch offices and affiliate relationships in Wales, Scotland and Northern Ireland. The Trust's annual program budget is approximately £50 million (~$92 million), which is split 60:40 between Action Energy and the Innovation Programme

Drivers of Carbon Management

Regulatory Drivers

Virtually every UK business is touched by at least one of these policy measures, either through their fuel bill, their tax bill, or through participation in a carbon-trading program. But the net impact on any individual business is not immediately obvious, nor is the appropriate response. As a starting point, it is expected that all businesses will pay higher energy costs as the EU ETS takes effect, and several primary industrial materials are also expected to increase in price.

However, for any individual business, the more important questions revolve around competitive impact and net income. Contrast, for example, a gravel-supply company and a company producing commodity steel products. The former likely faces few or no competitors, from within the EU or from countries without a Kyoto obligation (e.g., China, the US). The gravel company may expect its energy costs to increase as a result of the CCL and the EU ETS, but without competitors not affected by these policies, it should be able to pass on the cost increase to its customers. But further analysis raises further questions: might the gravel company's customers begin to substitute other, less energy-intensive materials if the price of gravel increases too much? Will the gravel company's net income erode as a result? What should the company do in response? Can it increase its energy efficiency to offset the increased cost of energy? Can it do so faster and more effectively than its less energy-efficient competitor in the next county, and increase its market share?

The situation for a commodity steel producer is complex in a different way. A UK-based steel producer may be directly affected by the EU ETS, and thus have its site emissions capped. In addition, its purchased energy costs are likely to increase due to the CCL and the effect of the EU ETS on electricity prices. In competition with other European companies, there is some hope of parity based on the fact that the EU ETS applies to the EU-25, although not with perfect equality (the member-states' power markets vary in their level of competition, reserve margin and fuel mix) . But the larger threat is commodity steel competition from countries outside the Kyoto framework. These competitors pay no carbon taxes, nor do they have a cap on their emissions. Fractional price differences can lose a sale in this industry. Should the steel company accept a lower return on capital, a lower market share, or some blend of the two? Can the steel company reduce its direct emissions such that it can sell its excess allowance, and create a new income stream?

Non-Regulatory Drivers

In addition to the direct impacts of the climate policy regime, the UK has also witnessed a rising level of attention to corporate social responsibility (CSR) over the past 10 years or more. This has been evidenced in negative ways (boycotts, protests, denial of site permits) and in positive ways (preferred supplier programs, socially-responsible investment funds, higher margins on "sustainable" products, etc.). Publicly-traded UK businesses typically expend more effort on CSR and on CSR reporting than appears to be the case in the US. As climate change has become an increasingly prominent issue in the UK, businesses with a significant public exposure (brand-name household goods, quality retailers, retail financial service companies)

have sought to increase their brand value by positioning themselves as committed to climate protection.

In addition, the UK investment community has become increasingly sensitized to the impact that carbon policy will have on net income and share prices. As a result, a number of traditional investment houses are scrutinizing the carbon management approaches of their portfolio companies to evaluate whether (and how) they are managing regulatory risk. This in turn affects companies' cost of capital, which is a subject that always resonates in the executive suite and the boardroom.

Proposed Solution

The fundamental hypothesis that shaped the Carbon Management program is that the successful transition to a lower-carbon economy is a change management issue rather than a technical issue. The necessary technologies are available today. The regulatory environment has been configured to internalize the costs of GHG emissions, and significant non-regulatory drivers also motivate many companies to address their GHG impact. Financial resources are available to help mitigate the first cost barrier to operational improvement. The final barrier – and the highest – is gaining and holding management attention and commitment so that GHG emission issues become part of tactical and strategic business decision-making.

However, the business analysis required to identify the correct strategy is not straightforward. Given the complexity of UK and EU climate policy, and its ongoing evolution, it is unreasonable to expect that most UK businesses will have the necessary analytical resources to develop the correct strategic approach. Furthermore, if each business developed its own approach and analytical tools, there would be an unnecessary expenditure of time and resources, not to mention an open-ended debate regarding which methodology was the best or even sufficient.

The Carbon Trust saw an opportunity to play a catalytic role as sponsor of a UK-wide Carbon Management program. The Trust brought certain key resources and skills to the table. First, as a center of expertise in climate policy and programs, it was well-equipped to develop guidance and tools to assist companies in charting their carbon management strategy. Second, as an institution located in the seam between government and business, the Trust had the credibility to recommend that UK corporations needed to embark on a significant change management exercise if they wanted to be fully successful in the transition to a low-carbon economy. Finally, the Trust has the ability to make decisions quickly, the latitude to capture opportunities, and has the resources to invest in its vision.

The Trust's senior management felt that the scale of the carbon management problem and the need to test solutions quickly merited a significant investment. The Trust decided to test its idea via a pilot program that would offer UK corporations a substantial injection of high-quality consulting support to undertake the business case analysis and to assist them through the change management process. Each pilot participant was ultimately able to utilize £50,000 (~$92,000) worth of consulting support, paid for by the Carbon Trust, as well as a suite of tools and materials developed by the Trust. Pilot participants would be driven through a 5-stage analytical process (see Table 1 below) to ensure that the business case was properly framed, that the analysis was broad and rigorous enough to support an investment plan, and that actual implementation of the analytical recommendations would result.

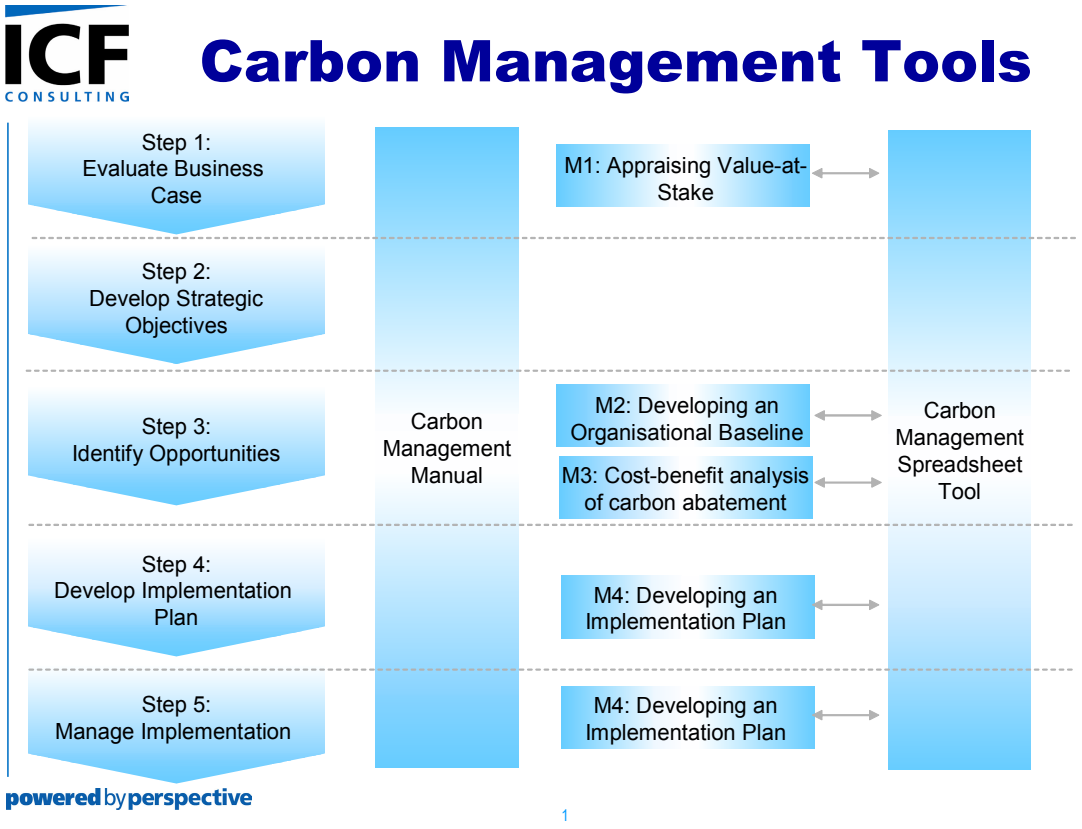
Table 1. The Carbon Management Process

Step 1: Evaluate the Business Case	Develop an overall understanding of climate change and its risk and opportunities for your organization
Step 2: Develop Strategic Objectives	Develop and agree on overall objectives and your approach to carbon management, consistent with core business objectives
Step 3: Identify Opportunities	Establish a detailed picture of organization-wide emission assets and liabilities. Generate specific ideas for achieving cost-effective reductions.
Step 4: Develop and Implementation Plan	Rank ideas, consistent with organizational objectives. Develop an overall implementation plan, including specific emission reduction targets.
Step 5: Manage Implementation	Monitor implementation progress. Review and update plan.

Pilot Program

Planning for the pilot program began in February 2003. As a first step, the Trust developed a more detailed articulation of the business case for carbon management, and commissioned ICF Consulting to develop a set of analytical tools and workbooks (see Figure 1 below) to be used by program participants and their consultants. These tools were designed to guide program participants and their consultants through the analytical and change management process. They consisted of:

Figure 1. Carbon Management Tools

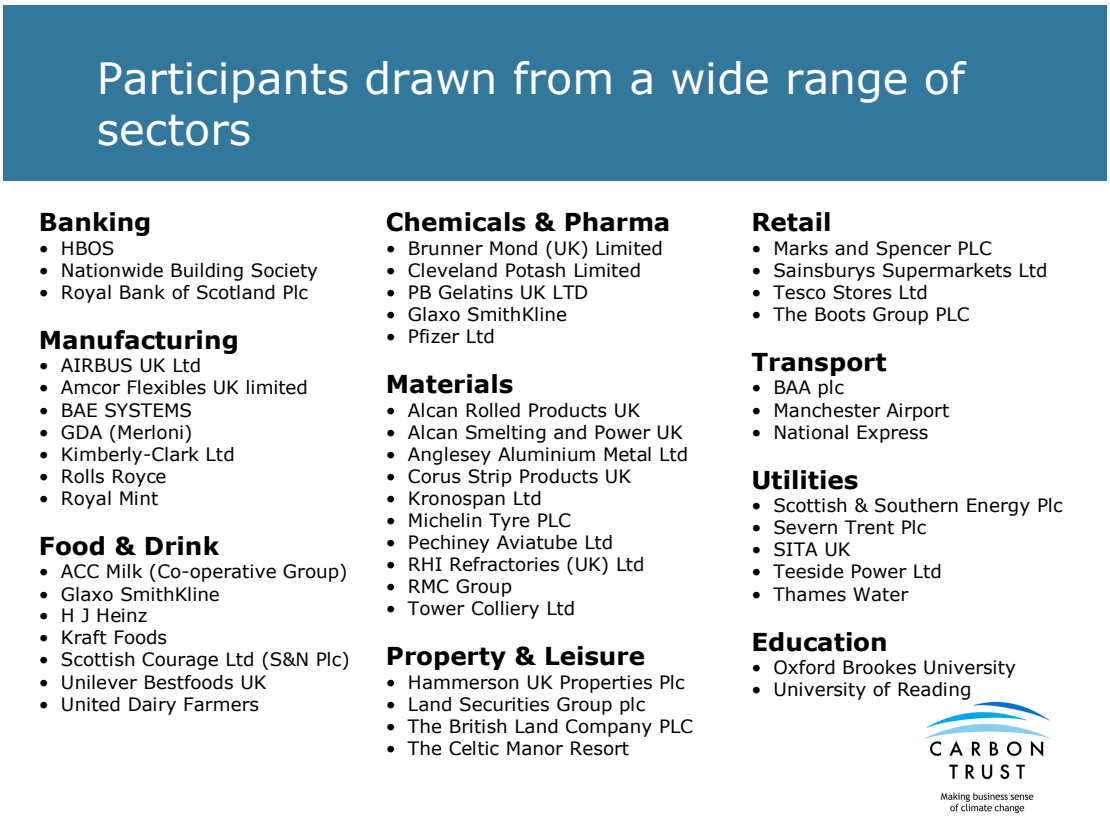


- a *Carbon Management Manual*, which provides policy and overall program guidance to companies and their consultants;

- 4 analytical modules, which provides a workbook-like structure to guide the process through each key step; and
- a spreadsheet tool to capture data and facilitate analysis of options and outcomes.

Recruitment of the 50 pilot participants (see Figure 2) took place during the summer of 2003, and the pilot program was launched on October 1.

Figure 2. Pilot Program Participants



In parallel with the participant recruitment process, the Carbon Trust established a roster of management consulting firms to provide support to pilot participants. The roster was purposely varied: some firms had strong qualifications in climate policies, others in techno-economic analysis, and others in change management. This permitted pilot participants to choose consultants that best filled gaps in their own capabilities. Some pilot participants already had a relationship with one of the consultants on the roster. Others were invited to interview up to three consultants before making their choice. Of the 10 consultants on the roster, 8 were eventually selected by one or more companies to assist with the carbon management process.

Pilot participants and their consultants worked through Steps 1-4 of the implementation plan over the October 2003-February 2004 period. Each participant/consultant team was responsible for submitting an interim case study in March 2004, followed by an implementation plan. The first "showcase" implementation activities are expected to follow during the Spring and Summer of 2004.

Interim Findings

Participants' Progress in Following the 5-step Change Management Process

One of the main challenges faced by the program was how best to balance the needs of the stakeholders: the Carbon Trust; the specialist consulting companies; and the participating companies. The Carbon Trust favored a standardized approach across all participants in order to meet its objectives of delivering cost-effective emissions reductions, to facilitate knowledge capture and to allow development of a program model that could be applied cost-effectively to a wider market.

However, the consulting companies all entered the pilot program with legacy methodologies and a diverse range of expertise. This expertise ranged from deep climate change policy knowledge to specialist change management techniques.

In addition, it quickly emerged that each of the participating company had a unique set of requirements, in-house capabilities, and balance between strategic and tactical mind-set:

- Several of the project managers had already identified tactical initiatives (e.g. the development of a web enabled energy monitoring system at a major property company), but had insufficient resources to develop without external assistance.
- Existing carbon management capabilities ranged from novice to expert.
- Project managers ranged from site energy managers driven by the need to meet this year's cost reduction targets, to executive directors concerned with the survival of their whole business.

However, in spite of this diversity of needs, almost all of the pilot projects followed the general 5-step framework. The key success factor in achieving this has been the flexibility allowed in allocation of resource between individual steps. The variation was necessary in light of the very different levels of experience that participating companies had with carbon management. We found that participants fell into three broad segments:

- Novice companies (~20% of participants), which followed the 5-step process as originally envisaged with a balance of resources applied between building the business case and driving to action.
- Maturing companies (~60% of participants), where the focus of the project was on identifying value-at-stake and using broader climate change drivers to raise the profile of legacy "energy efficiency" projects.
- Experienced companies (~20% of participants), which used the process to codify their existing work and used the balance of resource to accelerate the development of novel projects. For example, a power company investigated the substitution of natural gas with bio-diesel in one of their generating plants.

The pilot program has benefited from this diversity. With immature companies, the value has been captured from the introduction of carbon management processes and emission reduction projects. With more experienced companies the Carbon Trust has been able to capture best-practice while accelerating implementation of the novel approaches that will be required to meet the UK's aspiration of a ten-fold reduction in carbon intensity by 2050.

The Level of Engagement by Senior Managers at Participating Companies

At the start of the program, over 80% of the pilot projects were led by operational managers. This encompassed a range of positions, including technical directors, site operations managers and group environmental/CSR managers. However, by the end of the program over 50% of pilots had engaged senior management, either at the corporate executive or Board level.

The underlying driver of this has been the identification of the value-at-stake across the business that is now materially higher in the emerging climate change policy environment than with traditional energy efficiency messages. As well as elevating the level of engagement, the projects were generally successful at engaging managers from a variety of departments across the organization. Over 80% of projects included one or more of the following departments: finance, sales and marketing, and strategy and business planning, in addition to the expected participation of the core engineering, operations and environment-health-safety groups.

The Magnitude of Emission Reduction Actions that Win Management Support

Pilot participants have identified a technical potential of over 5 million metric tons of carbon dioxide equivalent (Te CO_2e) of carbon reduction opportunities, traceable to energy efficiency (3.0), fuel substitution (1.3) and non-energy emissions (0.7). Over 70% of the technical potential, or 3.5 million Te CO_2e, have a positive net present value at the companies' cost-of-capital and assuming an EUA price forecast of €10/TeCO_2e (~ $13/ton CO_2e). Of these value-added projects around 60% have being incorporated into implementation plans or are subject to detailed feasibility studies. Given the capital investment cycle and the complex nature of many of the projects, it is too early to determine the magnitude of emission reductions that will be delivered, but previous experience suggests that between 30-50% of the economically-viable projects will be implemented. A number of participants have already implemented quick-win measures, initiated detailed feasibility studies and prepared capital investment cases for a number of projects.

The pilot participants in aggregate have an "own facilities" carbon footprint of approximately 35 million TeCO_2e, which suggests that they may reduce their emissions by approximately 4% as a result of the pilot. However, we believe that the estimate is low, principally due to the uneven level of analysis across the participants. In one particularly striking example, 3 participants in a single industry sector worked with 3 different external consultants, and found opportunities to reduce their emissions by .5%, 5% and 50%. We therefore believe that substantial additional reduction opportunities are available. Yet notwithstanding this point, it is worth noting that the UK – which reached its c. 2010 Kyoto target level (12.5% reduction vs. 1990 levels) in 2003 still faces an additional challenge in achieving the UK's 20% reduction goal by 2010 compared with 1990 levels.

The Extent to which Companies Benefit from the Consultants and Tools Provided by the Carbon Trust

The diversity of needs (see above) within the program meant that application of a standard toolkit was less valuable than originally anticipated. A survey of the 8 consultancy companies used to deliver the program highlighted that many project leaders used their own proprietary baseline, opportunities database, and MACC spreadsheet tools. However, the *Carbon*

Management Manual and supporting reference material was used by almost all of consultants at some stage. Most valuable was the value-at-stake module; this covered an incremental stage to traditional environmental/technical approaches and therefore was the most novel of the techniques being applied.

Almost all of the participants felt that the mix of legacy consultant skills and the Carbon Trust's approach added significant value. None of the participants withdrew from the program.

The Extent to which Carbon Management Yields Incremental Results Beyond a Narrower Focus on Energy Efficiency

Two clear benefits of adopting a carbon management approach were in the elevation of management engagement and in the identification of a wider range of emission reduction opportunities.

In the absence of the climate change agenda, the principal driver for energy efficiency for an individual business is that of reduced cost. For non energy intensive sectors, energy costs are small as a proportion of total cost and therefore rarely material in attracting management attention above facilities management or operating site level. Carbon Management considers other drivers of value at stake than cost, including regulatory requirements, new revenue opportunities, threats to core markets and reputational issues. This increases the "size of the prize" and highlights the impact that climate change will have on the company's core business activities. A previous program, offering companies a similar scale of support resource (the Action Energy "Engagement" pilots), was successful in driving the identification and implementation of energy efficiency projects but was less successful in sustaining the engagement of senior management.

Within the carbon management approach, energy efficiency has become "what you do" rather than "why you do it". 60% of the emission reduction projects identified were operational energy efficiency projects. This reflects the importance of gas and electricity energy usage in the participants' carbon footprint, and the lack of policy and commercial incentives to address supply-chain and transportation initiatives. A study by Imperial College, commissioned by the Carbon Trust, projects that half of the emission reductions required to hit the UK's aspiration of a 60% reduction in emissions by 2050 will come from energy efficiency improvements. (Wordsworth and Grubb, 2002) The carbon management approach gives a remit to look beyond energy efficiency; many of the participants were therefore able to identify opportunities that will begin to address the remaining half – primarily through clean energy supply. In one Food & Drink company, a cost-effective option to import process steam from a local biomass CHP plant is now being pursued. This will virtually eliminate all direct on-site CO_2 emissions. Creating end-markets for biomass and other low carbon technologies is a critical (and unanticipated) policy benefit of the Carbon Management program.

Cost-Effectiveness

The total cost of the pilot program, including direct participant support costs, allocated program management costs and marketing activities was £3m ($5.4m) representing around 5% of the Carbon Trust's annual budget. As the program was a pilot it was treated by the Carbon Trust as a research & development investment. However, while the pilot has been a success in

terms of the Intellectual Property generated, it is valuable to consider cost effectiveness in order to inform future program development.

The Carbon Trust closely measures the cost effectiveness of all its programs and commissions an annual, independent survey of customer organizations to identify the actual carbon savings achieved that can be attributed to its activity. The next survey will take place in early 2005, and as a result the cost effectiveness (in terms of £/$TeCO_2e$) of the Carbon Management pilot program will not be known until then.

However, one leading indicator is the cost per $TeCO_2e$ for projects identified and incorporated into participants' implementation plans. By this measure the program has a policy cost of ~£2/$TeCO_2e$. This is extremely cost effective, particularly when compared to the UK Government's forecast of £20/$TeCO_2e$ for the cost of the impact of climate change.

It should be noted that the policy cost does not consider the shareholder value created from companies' implementation of projects with a positive NPV. From the marginal abatement cost curves, we have estimated the total shareholder value that would be created were companies to implement all cost-effective projects to be approximately £70m. When taken at a UK level, it is reasonable to assume that the net impact of the program has been economically as well as environmentally positive.

The Extent to which Carbon Management has become Embedded into Day-to-Day Corporate Decision-Making

All of the companies who participated have embedded some elements of the carbon management approach into their day-to-day activities. However, there are two broad segments:

- Strategic level carbon management. Around 25% of the 50 participants now consider carbon to be a Board-level issue (for one participant with major exposure to the EU ETS, it was "the number one issue for the Board") and see climate change impacts and policy as a major aspect of their business planning and operations.
- Tactical level carbon management. The remaining companies are focused on implementing the emission reduction projects and are using the value of carbon to support investment cases. In addition, they are using the systems introduced to better monitor and manage their carbon footprint.

The likelihood of each participant embracing a strategic vision of carbon management was determined by a number of factors: the quality of the consultant resource; the seniority of the project sponsor; the level of existing carbon management activities on entering the program; and perhaps most importantly the materiality of the climate change drivers on the individual company.

A parallel Carbon Trust market research program on 25 non-participant large UK companies, identified that almost all companies are now considering a response to climate change at the corporate level. However, the average time between initial engagement and developing a structured investment program is expected to be around 3 years. Only the top 25% had a comprehensive carbon management system in place that linked strategic aspirations with concrete implementation plans at the business unit level.

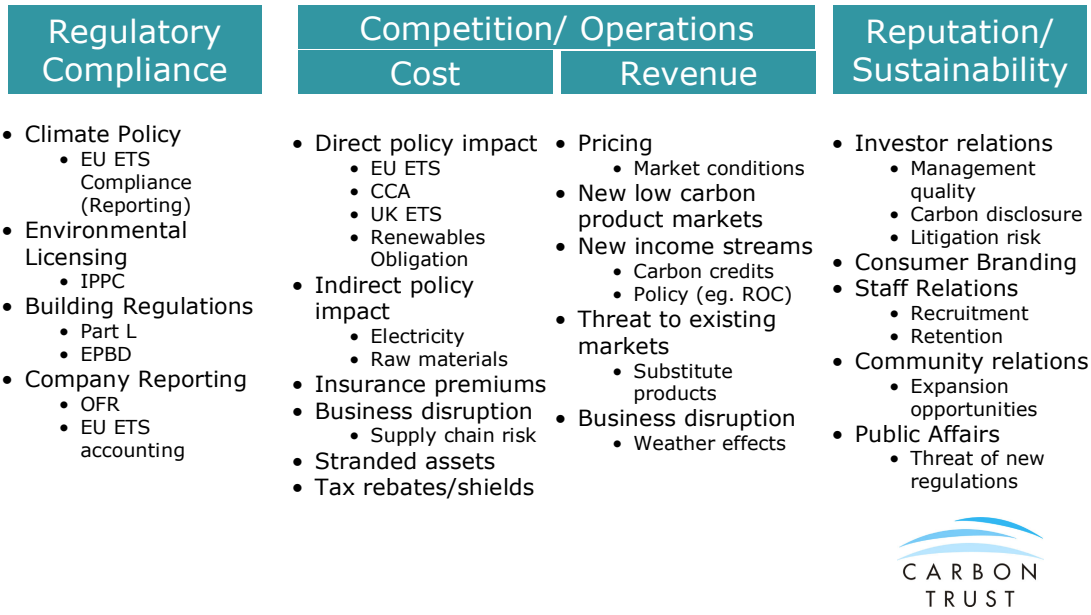
Additionality of the program in this respect is hard to measure, primarily because of the significant developments within the EU Emissions Trading scheme framework, which were

made while the pilot program was underway. However, at the very least it has accelerated the development of company-wide carbon management systems within the participant companies.

Analysis of Drivers and their Effects

The preparatory study by ICF Consulting, the findings of the 50 pilot studies, ongoing research (see, for example, the Carbon Disclosure Project, www.cdproject.net) and interviews with leading companies, suggest that there are three broad categories of climate change drivers of business value. These are regulatory compliance, competitive position, and reputational issues and are illustrated in Figure 3 below.

Figure 3. Carbon Management Drivers



- **Regulatory** All the participant companies are affected by these drivers, although responsibility for meeting them was generally delegated to a middle management level.
- **Competition** drivers, affecting both cost and revenue, are largely the result of policy initiatives, and represent the majority of the quantifiable value-at-stake. The opportunities to achieve a competitive advantage through a proactive carbon management strategy are generally greatest within those sectors affected by market-based policy instruments (such as the EU Emissions Trading Scheme) and the impact of adverse climate conditions.
- **Reputational** drivers reflect the rise of climate change as an issue for the broader stakeholder group. While difficult to quantify, these drivers are generally close to the senior management agenda, particularly in large private companies and utilities.

For the major sectors within the pilot, Table 2 summarizes the relative importance of the driver categories.

Table 2. Relative Importance of CM Drivers

Sector	Quantified Value at Stake (%EBIT)	Relative Importance of Driver Category			
		Regulatory	Cost	Revenue	Reputation
Utilities	10-20%	Low	High	Medium	Medium
Manufacturing	2-5%	Medium	High	Low	Low
Chemicals	5-10%	High	High	Low	Low
Pharmaceuticals	1-2%	Medium	Medium	Low	Medium
Materials	10-20%	Medium	High	Low	Low
Food & Drink	5-10%	Low	High	Low	Low
Property & Leisure	1-2%	High	Low	Medium	High
Retail	1-2%	Low	Medium	Low	Medium
Banking	<1%	Low	Low	Medium	Medium
Transport	2-5%	Low	Medium	Medium	High

The findings show that for sectors where strong regulation and policy mechanisms exist (currently the traditional energy intensive sectors) then the quantifiable value at stake is now significant. In less carbon intensive sectors (such as banking) then the Regulatory and Cost drivers are still low; reputational drivers therefore become more important. In the case of transport, concerns over future regulatory regimes are a strong driver of pre-compliance activity.

Participants within individual sectors placed different emphasis on the importance of individual drivers. This often reflected the different functions acting as project sponsor or the maturity of the company with respect to carbon management. However, in many sectors climate change mitigation policies have a differential impact upon individual companies. In an increasingly carbon constrained economy, high carbon companies, those with higher intensity legacy assets or processes, face higher costs than their low carbon competitors. Climate change therefore offers an opportunity to pursue a differentiated strategy within these sectors. For example, retailers are anticipating the possibility of climate change linking into their core brand; however, while lower-price retailers are taking defensive action to mitigate against any downside impacts, others (where their core strategy is to pursue a high quality brand position) are beginning to see that climate change offers an opportunity to establish a differentiated position.

Participant Opportunities

Pilot participants identified a wide range of practical responses to meet their objectives. These were primarily carbon abatement projects aimed at improving competitive position through capturing "no-regret" opportunities. However, in addition many companies implemented enabling initiatives (such as establishing management information and trading systems) and communication initiatives (for both internal and external stakeholders). Some also chose to mitigate their short-term exposure to climate change policy and develop products to capture new business opportunities.

Other Initiatives

In addition to abatement measures, many companies identified other initiatives to support their wider strategic objectives. Most companies recognized the need for better enabling systems. These included formal and informal carbon management governance structures (e.g. Implementation Committees and dedicated carbon management resources), changes to existing

systems (e.g. capital appraisal and procurement procedures), and improved measurement and reporting systems. Some of the most successful projects resulted from including a carbon management remit within existing core business processes and high-profile initiatives (e.g. Operational Excellence)

Improved communication, both internal and external, was also seen as a key action for many participants. Where a company is undergoing significant internal change (e.g. through major cost reduction programs) then raising staff awareness of the company's proactive stance on climate change was seen as particularly beneficial. Companies that identified investor relations as a key driver dedicated resources to communicating the improved management systems and their proactive approach to managing climate change risks.

A number of options existed for companies to mitigate their short-term exposure to climate change policies, for example through opting out of phase 1 of the EU ETS. The program helped many companies to make informed tactical choices (e.g. on retaining climate change agreements or entering the EU ETS) that optimized their short-term advantage from the policy environment. Other companies instigated a broader program of Government engagement (e.g. on allocation of allowances and seeking to inform medium-term policy development)

Finally, companies seeking to maximize the opportunities presented by climate change undertook a variety of new product development activities, including launching lower carbon-intensity materials and "Carbon Management" services (a development of Energy Management services) to utility customers. In the Banking Sector, some participants sought to exploit their enhanced knowledge of climate change risk though improved portfolio selection and piloting new carbon-related financial services.

Implications for the Future

The next phase of the Carbon Management program is being decided as of this writing. It appears likely that the program will transition from an experimental pilot program to a full-scale roll-out, but several specific issues need to be addressed as part of that transition:

Options for an Expanded UK Program

Following the success of the pilot program, the Carbon Trust is considering various options for an expansion of the program. Several strategic decisions need to be taken on completion of the pilot phase, in addition to incorporating the lessons learnt to inform the detailed design of the future program. The key decisions to be taken are

- What is the target market size for the carbon management product? The Carbon Trust has estimated that ~2,000 companies within the UK have a high emission reduction potential. Within this market, the Trust will likely target high potential sectors and organizations (see Table 3) based on the additionality of the Carbon Trust's offering.

Table 3. Market Segmentation

	High Value at Stake	**Low Value at Stake**
Substantial Progress	Capture Best Practice	Encourage in a Low-Cost Manner
Low Progress	Focus Resources	Ignore

- What is the appropriate size and timescale for delivery of the carbon management approach? Is there a "one size fits all" or can the program be tailored cost-effectively to meet individual participant needs?
- What is the pricing and funding structure? If the offering continues to be on a part or fully-subsidized basis, then sources of funding will need to be secured. These could be from current Carbon Trust programs or other government bodies/programs. In addition, revenue could potentially be secured from participants.

The lessons learned from the pilot program will also be used to inform detailed program design. The key design considerations will be: screening out organizations likely to remain at a tactical level; matching appropriate consultant resource to the in-house company expertise gaps; and the role of and resource demands on the Carbon Trust account manager in the particular engagement.

The UK's pilot Carbon Management program has also provided a rich set of lessons for other countries to consider as they assess the advantages and disadvantages of different policies and measures. Some key issues for program managers to address would include:

- Is it more effective to build a carbon management program as a separate offering within an existing energy efficiency program (e.g., like the UK's Action Energy) or start afresh?
- Is the carbon management approach likely to succeed in countries such as the US where government agencies and industry have historically remained at arms length from each other?
- Is carbon management an appropriate approach in a country (such as the US) where the regulatory drivers of carbon management are weak or non-existent?
- How would the program play out if the government were not offering significant subsidy resources?

Each country's approach to managing emissions of greenhouse gases and promoting energy efficiency will shape the answers to these questions. The early findings of the Carbon Management Pilot Program are such that some other OECD countries are already in discussions with the Carbon Trust about adapting the program to meet their particular circumstances. This is one good indicator that the pilot Carbon Management program has made a strong contribution to the various approaches being used by governments around the world to help transition to a low-carbon economy.

References

Department of the Environment, Transport, and the Regions, Scottish Executive, The National Assembly for Wales, Department of the Environment (in Northern Ireland). 2000. *Climate Change: The UK Programme.* London: HMSO.

Wordsworth, A., and M. Grubb. 2003. "Quantifying the UK's Incentives for Low Carbon Investment." *Climate Policy* 3: 77-88.