Emissions trading and the management accountant - lessons from the UK emissions trading scheme

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1. Background and objectives

Emissions trading is a government level response to the dominant (although not unanimous) scientific view that emissions of greenhouse gases caused by human activity are causing climate change (Robinson et al., 1998; IPCC, 1990). In other words, there is a high level belief that emissions caused by human activity are giving rise to global warming. The consequences of climate change for management accountants, particularly in the area of cost management, are significant. A report produced by the New Economics Foundation in 2004, for instance, suggested that globally, 'the costs of 'natural' disasters mostly linked to global warming hit $60 billion in 2003, of which $15 billion were insured'. As a response to climate change, emissions trading is likely to become increasingly relevant to corporate life, particularly in the longer term, and current developments are likely to bring emissions trading to the attention of increasing numbers of management accountants within the next few years.

In general terms, emissions trading arises where targets are set through the allocation of allowances which stipulate the quantity of emissions allowed for a given period. Those who are able to reduce their emissions so that actual emissions are lower than the target are allowed to sell allowances; whilst those who fail to meet targets must purchase allowances to ensure that they hold allowances equivalent to actual emissions for the period. Particular schemes have particular requirements. The UK Emissions Trading Scheme (UKETS), for instance, is a voluntary scheme which includes an incentive for participating companies to meet their targets alongside a penalty for failure. Companies which fail to achieve anticipated reductions in emissions may therefore decide to purchase allowances in order to receive the incentive and to avoid the penalty. Emissions trading thus brings new challenges and poses novel problems because of the complex way in which it is being implemented. The challenge stretches all the way from the need to report the impacts of emissions trading in financial reports, through to the strategic implications of adapting to new forms of regulation, which will provide many companies with both challenging targets and significant opportunities.

Current interest in emissions trading centres on carbon dioxide (CO2) although this is only one amongst a range of gases with climate change implications. Carbon dioxide has accounted for the largest single contribution of any gas to the greenhouse effect (IPCC, 1990, p.xx). The major source of CO2 emissions arising from human activity is the combustion of fossil fuels (i.e. coal, oil and natural gas). Consequently, large installations in power generation, heavy industry and large domestic heating plants (or 'point sources'), are the major emitters, together with transport (or ‘mobile sources’). Methane (CH4), which is emitted mainly from gas pipelines, agriculture, coal mines and waste disposal, is the second major source of greenhouse gas emissions (IPCC, 1990, p. xx, xxi).

The UK is aiming to reduce greenhouse gas emissions by 12.5% during 2008-2012, compared to its 1990 baseline, as an obligation under the internationally agreed Kyoto Protocol, and the UK government has set the demanding national objective of a 20% reduction of 1990 baseline of CO2 emissions by 2010 (IEMA, 2001, p. 9). These targets are to be achieved by a number of policy instruments, including the UKETS introduced in February 2002 (Hill et al, 2005). The UKETS was preceded by two other policy instruments for the reduction of greenhouse gas emissions namely a ‘Climate Change Levy’, and associated ‘Climate Change Agreements’, and policies for ‘Renewable...
2. Benefits of the UK Emissions Trading

2.1 Benefits of the UK Emissions Trading Scheme

The findings regarding benefits are similar both to those anticipated by DEFRA (2001) and to those reported in a survey conducted by Enviros, which concluded (Enviros, 2003, p. 7):

- 33% of direct participants enrolled in the UKETS to obtain a financial incentive, with 63% reporting that they would not have participated in the scheme without the financial incentive,
- 17% participated to improve energy efficiency,
- 25% participated to demonstrate environmental initiative,
- 17% participated to develop trading experience.

2.1.1 Financial benefits and energy efficiency

Anticipated benefits include

- The view that the concept of emissions trading provided the opportunity for a more rational system of energy efficiency, based upon focusing investment on those installations having a higher cost-effective potential for emissions reduction.
- Anticipation that the future value of a permit to emit a tonne of carbon dioxide would exceed purchase price, enabling a profit to be made from the sale of any permits excess to requirements.
- The potential to use permits as a hedge against penalties arising from a shortfall in meeting agreed emission reduction targets.
- Anticipation that corporate emissions would not exceed their permitted levels, thereby enabling an income to be obtained from the UKETS incentive for meeting agreed emissions targets.
- For companies that were also signatories to a Climate Change Levy Agreement (CCLA), the potential to meet targets by purchasing permits through the UKETS.

All companies involved in our study aimed to gain long term energy savings from the achievement of emission reduction targets.

2.1.2 Environmental Initiative: reputation and awareness

All of the participants in this study commented upon the advantages to be gained from being seen as an environmentally aware organisation by both the public and shareholders alike. This was deemed to be particularly important to those organisations which set targets for that activity and subsequently reported achievement against those targets within financial reports. Participation in the UKETS also provided an opportunity for energy and environmental technologists to further raise the profile of environmental issues within the company, enabling their strategic importance to become more fully appreciated by the Board of Directors. Two of the five organisations in particular commented that emissions trading was being elevated to a key factor to be considered by the Board of Directors, and the introduction of the UKETS had helped in that process.

2.1.3 Trading experience: ‘learning by doing’

The final benefit reported by all of the participants in this survey was that of ‘learning by doing’, with particular consequences for the EU Emissions Trading Scheme commencing in 2005 (Hill, 2006) and Kyoto Protocol arrangements commencing in 2008. Furthermore, ‘learning by doing’ was considered useful for four of the five organisations as a consequence of their international operations; with consequences for global emissions trading and participation in Joint Implementation or the Clean Development Mechanism under the Kyoto Protocol. Related specific points raised by interviewees were:

- The opportunity to gain advantage from being a ‘first mover’ in a novel trading system, and to ‘learn by doing’ as the system is developed.
- To learn from being at the forefront of environmental management alongside other fossil fuel saving initiatives such as the use of electrical cars and the purchase of electricity from renewable sources.

This summary presents findings which have implications beyond the UKETS to a future where the European Union Emissions Trading Scheme (EUETS) is likely to affect many management accountants. It is based upon research focused on the costs and benefits of direct participation in the UKETS, and the role of management accountants and their systems in motivating reductions in emissions to support more general initiatives to mitigate the effects of climate change. Structured interviews were adopted with a sample of direct participants to establish a case study insight into the issues raised by the UKETS. The five organisations chosen included a university, three manufacturing organisations and an electricity utility. Each organisation was engaged in the reduction of CO2 emissions through energy savings in fuel or electricity consumption in their operations, and their targeted reductions by 2007 varied from between 5% and 22% of their baseline emissions. In addition, we also interviewed a trader and held discussions with governmental and industrial specialists and consultants to assess the wider international implications of emissions trading in general.
2.2 Costs
A range of direct and indirect costs and investments derived from participation in the UKETS:

- Data collection. Emissions records must be maintained and arrangements can be complex, particularly where firms are global and organised into autonomous Strategic Business Units.
- Investment. Investment in emissions reducing technologies may be required to achieve planned reductions in targets.
- Management time. Decisions pertaining directly to the operation of the UKETS held resource implications pertaining to the use of management time. For instance, for one of the company's interviewed, the company's head of environmental strategy worked in conjunction with a member of the company's Treasury department, who had previous experience in bidding and hedging strategies, to determine parameters for the auction which formed the basis for the UKETS (Hill et al, 2003). A strategy for the company was developed by these two executives using a computer based model to estimate profitability from various assumptions related to quantities bid, likely incentive prices for conformance, and likely prices for carbon emissions permits.

2.3 Implications for management accountants
Environmental accounting might be expected to provide an example of a paradox. On the one hand, influence over environmental issues appears to originate from non-accounting sources, and management accounting may even be obstructive to the emergence of an environmentally friendly mindset (Gray and Bebbington, 2001). Accounting has also been criticised for supporting language and techniques that have failed to adjust to changing environmental demands (Elkington et al, 1991) and new approaches to sustainability are arguably difficult for businesses to accept (Gray and Bebbington, 2001). Whilst environmental concerns have long term consequences, investment appraisal techniques, for instance, are considered to be short-term (Laverty, 1996). Budgeting and other forms of financial control have likewise been accused of being short-termist (e.g. Grinyer et al., 1998). In addition, it is argued, management accounting fails to direct attention to environmental issues through performance appraisal schemes in which 'traditional' financial concerns dominate environmental impact, when these come into conflict (Gray and Bebbington, 2001). The other side of this paradox is that management accounting systems are seen as being highly influential, as typified by Kaplan and Norton’s (1992, p. 71) assertion ‘what you measure is what you get’, or more forcefully ‘what gets measured, gets done’ (Otley, 1999, p. 368). The implication is that management accounting may be the most effective way of securing the kinds of changes needed by environmental management.

Those interviewees involved in our study appreciated the importance of a range of accounting approaches to environmental management, and expected those systems to be effective in changing behaviours. The sections below summarise our findings in relation to accounting systems which were discussed by interviewees.

2.3.1 Financial reporting and emissions trading
The reporting requirements for emissions trading challenge our fundamental notions of assets, liabilities, revenues, costs and profits. Is a permit an asset (because it represents a tradable commodity), or is it a liability (because it must be surrendered at a future date to show that emissions are within the target, or cap)? Should profits made on the sale of permits be shown in the
profit and loss account (despite the possibility that permits may have to be purchased at a later date if the company subsequently discovers that it holds insufficient permits to meet its cap)? If profits are to be shown, how is the profit to be calculated, especially for schemes where governments allocate permits at zero cost (e.g. under the EU Scheme)? These questions remain debatable at the time of writing and work on the relevant standard, IAS 20, is expected to resume around the end of 2006 (IASB, 2006).

2.3.2 Transfer pricing
One of our interviewees discussed the importance to emissions reduction of charging for energy through transfer pricing and the establishment of an autonomous division to manage energy. This division was a profit centre and energy costs were charged to other profit and cost centres within the company. These divisions in turn negotiated annual budgets and the charge for energy was considered to be a controllable cost; that is, it was taken to be ‘above the line’ in terms of establishing responsibility. The interviewee from the company considered the transfer pricing scheme to be effective because changing behaviour as a result of establishing responsibility may be the simplest way to reduce energy: ‘The easiest things are housekeeping things: training people to switch lights off; being intelligent about heating the buildings; looking at weather forecasts; energy audits, and discovering what is happening in the middle of the night. We don’t have processes running at 5.00pm on a cold winter’s day when prices are at their most expensive. The high energy processes are run when the electricity is cheapest.’

2.3.3 Performance measurement
As Robert Kaplan reported at a presentation given at INSEAD in 2004, the balanced scorecard can be extended to include non-financial issues relating to the environment. Environmental measures such as the output of emissions might represent a fifth segment that extends the scorecard beyond its current scope. The incorporation of the environment into the external financial reporting of non-financial factors is well established amongst UK top 100 companies. One of the interviewees commented that the external reporting of environmental impacts through financial reports was, ‘Something we were expected to do’. When pressed for reasons why the company was expected to report non-financial environmental measures, it became clear that the source of pressure was not regulation, or other formal sources of influence, but originated from peer pressure; the interviewee commented, ‘the majority of FTSE 100 companies do this’.

2.3.4 Capital investment appraisal
Investments to meet caps are likely to be sufficiently substantial to require capital investment appraisal and all of our interviewees referred to the importance of this management accounting technique to emissions trading. In one case, emissions trading had also provided a way of strengthening a proposal for a Combined Heat and Power installation that had previously been rejected. Emissions trading is likely to complicate the process of capital investment appraisal simply because it broadens the alternatives faced by any company seeking to manage its energy. Prior to emissions trading the cash flow forecasts would reflect the initial cost of the plant and the subsequent costs savings. Under the UKETS, cost savings remain, but there is an additional incentive to invest where this allows the company to earn the incentive through beating targets, or to avoid penalties arising from non-compliance, or to sell allowances where these become surplus to requirements. Alternatively, where market prices for allowances are low, there may be an incentive to purchase allowances rather than to invest in energy saving technology.

3. Summary and the future beyond the UKETS
In summary:
1. Worldwide initiatives are numerous and complex, currently involving a limited number of Management Accountants in the operation of the UKETS, but with the prospect that increasing numbers of Management Accountants will become involved in emissions trading through the EUETS and future plans under the Kyoto Protocol.
2. We learn from the UKETS that management accounting systems are currently central to many environmental concerns. In particular, capital investment appraisal, performance measurement and transfer pricing systems are already having an effect at the corporate level. Inter-governmental initiatives are creating new challenges for accountants. In particular, emissions trading impacts financial reporting. The lessons from the UKETS are relevant to future initiatives such as the EUETS.
3. The UKETS provides lessons for Management Accountants in relation to perceived costs and benefits of emissions trading schemes, many of which will be relevant to the EUETS.

Looking forwards, considerable uncertainty surrounds emissions trading. The most immediate uncertainties for UK companies concern the impact of the EUETS. It became apparent during the study reported here that participation in Phase 1 of the EU Emissions Trading Scheme, scheduled to run from 2005 to 2007, was being seen as more important to business than direct participation in the UKETS. The EUETS differs from direct participation in the UKETS in several important ways:

* The EU Emissions Trading Scheme is a compulsory scheme for CO2 emissions from defined installations.
• The compulsory feature of the system means that fines are levied for failure to meet targets or to purchase allowances to meet any shortfall.
• There are no financial incentives available for meeting the compulsory targets and so direct financial benefits are based upon the avoidance of penalties.
• The scheme has been extended to a large number of installations: approximately 1,000 installations are covered by the UK National Allocation Plan compared to some 34 direct participants in the UKETS.

As a consequence of the compulsory nature of the EUETS for defined installations, it is likely that there will be increased levels of risk associated with this scheme compared to its UK predecessor. It will therefore become more important for management accountants to pay more attention to risk analysis in emissions trading. Furthermore, if the Kyoto Protocol processes become more established, more (especially larger) firms are likely to become engaged in international emissions trading and the associated initiatives of Joint Implementation and the Clean Development Mechanism.
4. References


IPCC (Intergovernmental Panel on Climate Change), (1990), Climate Change: The IPCC Assessment, (edited by J T Houghton, G F Jenkins and J J Ephraums), Cambridge UP, Cambridge. IP/02/1832\O\R)


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