hfma briefing

Contributing to the debate on NHS finance
December 2009

Carbon reduction in the NHS: a role for finance

Foreword

Ask finance directors what is at the top of their organisations' agendas at the moment and the responses are likely to cover efficiency, maintaining or improving access, quality and service redesign.

Specifically within finance, the overriding need to drive efficiency in the face of dramatic growth reductions is likely to dominate. And there are other challenges such as the move to new accounting standards and dealing with the new version of healthcare resource groups and the payment by results regime.

But how many would identify carbon reduction as a priority? I suspect very few. Yet carbon reduction needs to be on all NHS boards' agendas if the exacting targets for reducing greenhouse gases set by the government and laid out in the NHS carbon reduction strategy are to be met.

Even the short term target – reducing the NHS 2007 carbon footprint by 10% by 2015 – is a big ask. And beyond that we are looking at matching the UK targets of a 34% cut in carbon dioxide by 2020 (compared with 1990 levels) and a massive 80% cut by 2050.

If the daunting size of this challenge is not enough to make finance managers sit up and take note, then there are a number of specific drivers that will put carbon reduction onto their agenda.

NHS bodies' performance on carbon reduction is increasingly having an impact on annual audit assessments. And a new energy efficiency scheme, involving the purchase and trading of carbon emissions allowances, will provide real financial consequences for under or over consumption of carbon.

But perhaps the biggest driver for the finance community is the fact that carbon reduction should in fact help them meet their key challenge – the need for efficiency. The NHS is coming to terms with the size of the efficiency challenge facing it over the coming years. With an energy bill of more than £410m a year, carbon reduction leading to lower energy costs makes business sense as well as being environmentally sound.

Keith Wood, chairman, HFMA Financial Management and Research Committee

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Executive summary

Climate change is perhaps the major threat facing the world. Unless greenhouse gas emissions – the gases that contribute to global warming – are cut drastically, increased global warming is expected to lead to more frequent and extreme weather events, including floods, droughts and tropical storms.

The Climate Change Act, which became law in 2008, sets the UK a challenging, legally binding target for a cut in greenhouse gas emissions of at least 80% by 2050 (compared with a 1990 baseline), and there's an interim target of a 34% cut by 2020.

As one of the world's largest organisations, the NHS has a crucial part to play in the overall push to reduce emissions. The NHS carbon footprint in England in 2004 was more than 18 million tonnes of carbon dioxide. Some 22% of this footprint relates to energy, a further 18% is travel, while 60% is the result of procurement.

The NHS carbon reduction strategy, published in January 2009, says the NHS will 'at least' meet these targets, recognising that despite growing carbon efficiency, the NHS has in fact grown its absolute carbon footprint by 40% since 1990. To meet the overall UK target reduction, the NHS will in fact need to cut its 2007 footprint by 86% by 2050.

Helping the NHS and individual NHS bodies meet this challenging target is a responsibility for everyone working in the NHS. Boards in particular have a responsibility to demonstrate their commitment to carbon reduction strategies.

But there are specific roles for finance managers. And there are a number of drivers that are requiring finance managers to take a growing interest in carbon reduction.

Efficiency The NHS needs to make efficiencies of between £15bn and £20bn in the spending period that covers 2011-2014 as it comes to terms with significantly lower growth than it has enjoyed in recent years. Cutting 1% from the NHS energy bill would save more than £4m a year and the Carbon Trust has identified significant opportunities to improve energy efficiency across the NHS. Cutting energy consumption will also protect the service against potential future increases in energy costs. Financial support in the form of interest-free loans is also available to NHS bodies to help them take advantage of energy efficiency technology. NHS finance will have a role in building up business cases and ensuring the focus is on overall life cycle costs, not just upfront purchase and implementation costs. Organisations may also need to start factoring in the carbon impact of proposals into business case evaluations.

Carbon trading In April 2010, the CRC Energy Efficiency Scheme will be launched. Participation in the scheme is mandatory for any organisation with at least one half-hourly electricity meter settled on the half-hourly market and total half-hourly electricity consumption of at least 6,000MWh. Some 5,000 organisations from the public and private sector are expected to participate fully. NHS bodies covered by the scheme will have to buy emissions allowances in an auction at the beginning of the year to cover their estimated emissions for the year ahead. If emissions exceed these allowances, organisations will have to buy additional allowances on a secondary market or through a government-run 'safety valve' mechanism.

The first auction is in April 2011. All the money collected in the sale of allowances is recycled back to participants. Each organisation's recycling payment is determined by the total pot available, its proportion of the total emissions in the baseline year (2010/11 for introductory phase) and a bonus/penalty based on ranking in a performance league table. Finance will have a clear role in understanding the financial implications of this scheme as it develops and accounting for payments and receipts arising from the purchase and sale of allowances and from the recycling payment scheme. There will also be a role for finance in the trading of allowances as this develops.

Auditors' interest in carbon Auditors are taking a greater interest in climate change and carbon reduction. PCTs face an annual use of resources assessment (UOR), while trusts continue to be assessed under the auditor's local evaluation (ALE). Both these assessments, which feed into the Care Quality Commission's annual health check, are widely seen as a measure of financial performance (although the UOR in particular is a much broader assessment).

Increasingly the actions being taken by NHS bodies to address environmental issues will have an impact on these assessments.

Introduction

Climate change is a big threat to the world and its population – possibly the biggest. The planet's temperature has risen 0.74ºC since 1900 and sea levels around the UK have risen by about 10cm.

In recent years, there has been an increase in extreme weather linked to accelerated global warming. Unless greenhouse gas emissions – the gases that contribute to global warming – are cut drastically, increased global warming is expected to lead to more frequent and extreme weather events, including floods, droughts and tropical storms.

While recognition of the extent of the threat has been growing for years, governments around the globe are now starting to take decisive action and set challenging targets to reduce emissions of carbon dioxide and other greenhouse gases – the main causes of global warming and the subsequent climate change.

In the UK, the government has introduced the Climate Change Act, which became law in November 2008. The challenging target at the centre of this Act is for a cut in greenhouse gas emissions of at least 80% by 2050, compared with a 1990 baseline. As a stepping stone towards this overall goal, carbon dioxide emissions are to be cut by 34% (again compared with 1990 levels) by 2020. (The Climate Change Act originally set this interim target at a 26% cut by 2020. But this was increased to 34% in the 2009 Budget. In fact the 2020 target is shorthand for a 34% annual equivalent percentage reduction below 1990 levels during 2018-2022, the period covered by the third carbon budget, which was also unveiled in the 2009 Budget.)

These targets are now legally binding.

The single biggest contributor to national greenhouse gases – accounting for some 65% of emissions – is the use of fuel to generate energy, followed by transport at 21%. While an estimated 40% of emissions in the UK are the result of decisions taken directly by individuals, big corporations and businesses have a significant part to play.

Climate change will have an impact on the population's health and health services. A joint publication from the Department of Health and the Health Protection Agency – *Health effects of climate change in the UK 2008* – points out that more frequent heatwaves and flooding may have a direct impact on demand for health services. Warmer summers could contribute to an increase in food-borne diseases. Changes in the air pollution climate, and in particular an increased concentration of ozone, could lead to an increase in hospital admissions. And skin cancer could also increase.

The NHS is one of the world's largest organisations. As such it has a crucial part to play in contributing to the overall cuts in emissions. Perhaps as importantly, the service's profile and standing in the community give it the opportunity to set an example to other parts of the public and private sector.

The Department of Health has recognised that the NHS has an important role in both reducing its own carbon footprint and setting this example. The clear message is that NHS organisations cannot afford to delay and need to take action now.

What is less clear is the role that finance managers have within this overall strategy to reduce carbon. This briefing sets out to investigate the specific drivers forcing finance to take a direct interest in carbon reduction and play a leading role in the overall achievement of the carbon reduction targets.

The NHS is one of the world's largest organisations. As such it has a crucial part to play in contributing to the overall cuts in emissions

NHS carbon reduction strategy and targets

The *NHS carbon reduction strategy* was published in January 2009 following consultation with the NHS and other organisations.

The strategy set out action areas for NHS bodies across wide-ranging areas including: energy and carbon management; procurement and food; travel and transport; water; waste; designing the built environment; organisational and workforce development; partnership and networks; governance; and finance.

The strategy sets out the ambition for the NHS to play a 'leading and innovative role' in ensuring the shift to a low carbon society. It requires every organisation to develop a board-approved sustainable development management plan and to start measuring and monitoring progress towards a 10% carbon reduction by 2015 compared with 2007 levels.

It calls on NHS bodies to sign up to the Good Corporate Citizenship Assessment Model and to raise carbon awareness at every level of their organisations.

Specifically in terms of the health service's own carbon consumption, the strategy says that every organisation should review its energy and carbon management at board level, develop greater use of renewable energy where appropriate, measure and monitor on a whole life cycle cost basis and ensure that appropriate behaviours are encouraged in individuals as well as across the organisation.

On finance, the strategy calls on every NHS organisation to become carbon literate and carbon numerate. They should ensure appropriate investment to meet the commitments required to become part of a low-carbon NHS and in preparation for a carbon tax regime.

More specifically it lists five key actions in finance:

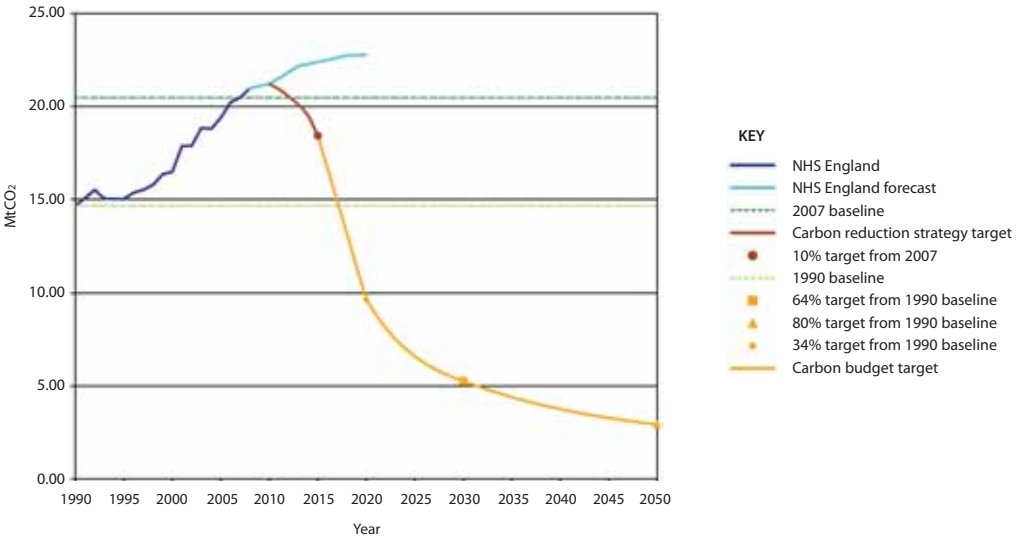
- NHS organisations should develop carbon literacy and embed carbon reduction in their financial mechanisms
- NHS organisations should take advantage of schemes that support investment in energy efficiency initiatives
- The Department of Health and NHS Sustainable Development Unit will provide practical guidance for trusts on the CRC Energy Efficiency Scheme
- NHS organisations should be involved in local strategic partnership arrangements and regional economic forums to play their part in developing a sustainable and resilient health economy
- The Department and NHS Sustainable Development Unit will work in collaboration to encourage the development of further incentives to support carbon reduction in the NHS.

The NHS in England's carbon footprint (measured in emissions of carbon dioxide, CO_2 or CO_2 equivalent) was most recently measured in 2004 at 18.6 $MtCO_2$ (18.6 million tonnes of carbon dioxide).

Some 22% of this footprint relates to building

On finance, the strategy calls on every NHS organisation to become carbon literate and carbon numerate

NHS England CO_2 baseline to 2020 with Climate Change targets



CARBON REDUCTION OUTSIDE ENGLAND

While the specific CRC Energy Efficiency Scheme (see page 9) spans the UK, each of the four nations' health services are developing their own approaches to reducing the greenhouse gases.

In October 2009 Scottish health minister Nicola Sturgeon promised tough targets on carbon reduction for NHS Scotland following the passing of the Climate Change (Scotland) Act 2009 and a report on the health service's carbon footprint. The former set out the 80% reduction in greenhouse gas emissions (in Scotland as a whole) by 2050 based on 1990 levels. It also pledged an interim 42% cut by 2020 and gave ministers the power to confer climate change duties on public bodies.

The report, *Carbon footprint of NHS Scotland*, which was published by Health Facilities Scotland, found the health service generated 2.63 million tonnes of CO_2 (2.63 Mt CO_2) in 2004 – 3.6% of Scotland's total output and 23% of the public sector's emissions.

A baseline exercise carried out as part of the study showed 52% of CO_2 emissions were generated by procurement (NHS Scotland spends more than £3bn a year on goods and services), 25% from travel and the remainder from building energy use.

NHS Scotland's CO_2 output had remained relatively steady since 1990, it said. It was estimated that NHS Scotland's carbon footprint declined by 4% from 1990 to 2004. However, this stability masked two key trends – that building energy emissions had fallen by around a third (34%), while procurement emissions were rising (by 20% over the period).

The report made a number of recommendations. These included the need to identify carbon hotspots (such as patient travel and pharmaceutical procurement) in order to determine more effective strategies for carbon reduction and carbon reporting within specifications for supply chain contracts.

The climate change strategy in Wales has set an overall annual emissions cut of 3% a year from 2011 in order to reach the 80% reduction target before 2050. The public sector, including the NHS, has been given a leading role in achieving this target.

In its *Climate change strategy: programme of action consultation*, published in June 2009, the Welsh Assembly government said NHS trusts were required to adopt a range of environmental policies and strategies, including developing an energy consumption programme and energy-efficiency targets.

Their energy performance is monitored annually and figures show the 2007/08 net energy consumption was 6% lower than in 1999/2000, while energy efficiency improved by 19% over the period.

Welsh hospitals generate about 9% of their electricity from combined heat and power (CHP) sites – equating to an annual carbon saving of more than 3,000 tonnes of CO_2. A replacement CHP scheme at the largest hospital site – the University Hospital of Wales in Cardiff – was completed in January 2009. It cost approximately £3.8m, though it is estimated it will save £1.6m a year at current energy prices.

The Assembly government allocated £3.3m to trusts in 2006 to fund energy-efficiency schemes, which were based on the trusts' three-year energy efficiency plans. A total of 149 schemes, such as low energy LED external lighting, better insulation and the installation of more efficient, condensing boilers, identified a potential saving of more than 13,000 tonnes of CO_2.

Given the degree of rurality in Wales, trusts must produce travel plans to reduce carbon emissions and the service has invested almost £9m in telecare services, which reduce the distances patients must travel.

In Northern Ireland the Department of Health, Social Services and Public Safety (DHSSPS) is developing its strategy in relation to carbon reduction. 'The DHSSPS is taking forward an assessment of the carbon footprint for the delivery of health, social care and public safety that will allow the Department to develop a carbon reduction strategy,' a spokesperson said.

energy, 18% is travel, while 60% is the result of procurement. Within procurement, pharmaceuticals and medical equipment make up half of the 60% emissions, with pharmaceuticals accounting for a full fifth of the total footprint emissions.

In total the NHS is responsible for a quarter of public sector emissions in England and 3.2% of the country's total emissions. The *NHS carbon reduction strategy* makes it clear that the NHS aims to 'at least' meet the UK targets set out in the Climate Change Act (an 80% reduction by 2050 and a 34% reduction by 2020).

The strategy recognises that, despite growing carbon efficiency, the NHS has in fact grown its absolute carbon footprint by 40% since 1990 – moving it in the wrong direction compared with the overall UK target relative to the 1990 baseline.

This makes the NHS 2050 challenge even tougher than the already stretching UK 80% reduction target – requiring an 86% reduction of its 2007 footprint. As a first step the strategy sets a target for the NHS to reduce its 2007 carbon footprint by 10% by 2015, passing the 2007 baseline in 2013. (The *NHS carbon reduction strategy* refers to the 2004 NHS carbon footprint of 18 $MtCO_2$. This was rigorously calculated using actual data, however the unit's projections put the 2007 footprint at over 20$MtCO_2$ and it is against this footprint that the 10% target will be measured. This is due to be updated in early 2010.)

At present no mandatory targets have been set for

NHS bodies to support these overall reduction goals. However, it is highly likely that formal targets are on their way.

As part of the Budget in 2009, the government announced three five-year carbon budgets – capping the amount of carbon emissions in each period. It followed this up in July with its low carbon transition plan. This sets out how cuts in emissions will be delivered to enable the budgets to be adhered to and more specifically allocates all government departments their own carbon budget and requires them to produce their own plan to achieve these budgets.

At the time the plan was published, the Department of Health's carbon budget covered only its own operations and did not include the wider NHS. However the NHS is due to be included within the Department's carbon budget from April 2010. This is likely to include passing on shares of the overall required cuts to trusts and primary care trusts and other NHS bodies. Mandatory targets are expected to feature in a future operating framework (as this briefing went to press, the operating framework for 2010/11 had yet to be published).

However, the carbon reduction strategy warns against the service waiting for mandatory targets before taking action. It points out that mandatory targets have been set before. In 2001 targets required a 15% cut in carbon from energy use by 2010, and it is understood that these targets have not been hit.

Even so, the consultation on the NHS draft carbon reduction strategy revealed a strong call for central guidance and support for quantitative milestones.

CARBON FOOTPRINTS

A carbon footprint is defined as the total set of greenhouse gas (GHG) emissions caused directly and indirectly by an individual, organisation, event or product.

The term 'carbon' footprint is used as commonly the total GHG emissions are converted to carbon dioxide equivalent (CO_2e) emissions. There are different ways of defining what is included in a footprint, but the commonly used model is known as the GHG protocol and breaks the overall footprint down into:

- Scope 1: emissions from burning gas, coal, oil including fuel used in vehicles owned by the organisation (sometimes known as the direct carbon footprint).
- Scope 2: emissions from purchased electricity
- Scope 3: emissions from other activities that the organisation can influence – for instance, energy used in production of purchased goods.

The carbon transition plan sets out how cuts in emissions will be delivered to enable the budgets to be adhered to

About this guide

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Albert House, 111 Victoria Street, Bristol BS1 6AX
Tel: 0117 929 4789
Fax: 0117 929 4844
Email: info@hfma.org.uk
Website: www.hfma.org.uk

Efficiency and productivity

It has been estimated that the NHS will need to make efficiencies of between £15bn and £20bn in the spending period that covers 2011-2014. While final settlements have not been announced for this period it is already clear that growth will be considerably below the levels enjoyed by the NHS in recent years. At the same time the service will have to maintain the good access standards that have now been set, deliver higher levels of quality and absorb considerable cost pressures (such as incremental pay drift, the costs of new expensive drugs and rising clinical negligence costs). This will demand a focus on delivering efficiency.

Efficiencies and cost improvements will need to be found from across the health service's activities, including front line services, where there is an increasing recognition that pathways can be redesigned to deliver higher quality care at more cost-effective rates. However, traditional areas for cost savings will still be important and be expected to contribute to the overall savings. Back office functions and procurement in general will be key areas.

But reducing energy consumption should be a high priority – delivering on two fronts. It will cut costs and help the organisation and NHS meet carbon reduction commitments. It could even attract financial benefits through a finance recycling scheme under the new carbon trading scheme – the CRC Energy Efficiency Scheme (see page 9).

NHS buildings in England consume more than £410m of energy each year (2007/08 figures), according to the *NHS carbon reduction strategy*, with hospitals being the biggest users. Cutting 1% from the NHS energy bill would save more than £4m a year. Electricity accounts for half of a hospital's energy costs.

The Carbon Trust – an independent company set up by government to support organisations in the move to a low carbon economy – says that a significant proportion of this energy is wasted, meaning that money is being wasted too. Given the squeeze on NHS resources, energy efficiency projects should be seen as offering opportunities to cut costs, reduce carbon footprints and improve the indoor conditions for patients and staff.

The Carbon Trust describes numerous opportunities to save energy on its website (see appendix, page 22). These opportunities effectively fall into three categories: changing behaviour and practice; simple capital projects to refurbish facilities or systems; and more major or new build capital schemes. The Carbon Trust also runs an NHS carbon management programme that helps NHS organisations put energy saving schemes into action.

Cutting costs is in fact just one part of the need for efficiency. Another driver for reducing energy consumption is the rising cost of energy. Energy and fuel costs have risen dramatically in recent years – some reports suggest 50% energy cost increases over the past five years in the NHS and the forthcoming CRC Energy Efficiency Scheme will add a carbon cost over and above this.

Some increases have been followed by reductions in costs but in general NHS organisations and other public and private sector organisations have faced significant volatility on energy costs. And costs of fossil-based fuels are expected to keep rising into the future. While cutting costs is imperative for all NHS bodies, avoiding potential increases in costs is even more fundamental.

Service line reporting/management may provide an additional driver for discrete business sections to examine and reduce their own energy consumption. For this to be done accurately, sub-metering may be needed – taking regular readings for gas and electricity consumption in specific areas rather than for a whole site (see case study Wrightington Wigan and Leigh NHS Trust, page 17).

The Carbon Trust NHS carbon management programme provides technical and change management support to help NHS trusts produce a carbon management plan and achieve significant reductions in energy costs and carbon emissions. The aims of the programme are to embed carbon

INTEREST-FREE FUNDING

The Carbon Trust provides access to interest-free loans through Salix Finance. In the NHS these loans were previously only open to foundation trusts but the 2009 Budget made £51.5m available to help organisations in the public sector take advantage of energy-efficiency technology.

Loans do not require match funding and are offered on a first come first served basis. Some 80 different energy-efficiency technologies are covered, including building insulation, boiler and lighting upgrades, improved cooling systems and IT energy efficiency improvements. Projects must have a maximum five-year payback and the loan value must not exceed £100 per tonne of carbon saved over the equipment's lifetime.

management across the organisation and to make the business case to the board for cutting carbon.

'In our carbon management process, we help trusts to draw up all their potential carbon saving projects,' says Tim Pryce, public sector manager at the Carbon Trust. 'We then help them prioritise the ones they want to implement, quantify them – putting a number on cost savings, carbon savings and implementation costs – and help them to write it up into a full carbon management plan to be presented to the board for sign off.'

The programme started in April 2006 and each annual programme lasts 10 months. The fourth and biggest wave (32 organisations) began in 2009 and once they have finished 82 organisations across the UK will have been through the process. The Carbon Trust already has organisations signed up for next year (2010), the CRC Energy Efficiency Scheme and the NHS Sustainable Development Unit being key to this increasing demand. Mr Pryce says over the four waves, he has seen growing ambition in the NHS. 'Typically in the first wave, trusts were targeting 12-14% carbon reduction over five to 10 years,' he says. 'Now it is more like 20% over five years.'

Mr Pryce is clear that finance has a major role to play in the carbon reduction agenda, despite it being seen as an estates function. 'We need finance directors on board so trusts fully understand which carbon saving investment is most cost-effective, which have the best lifecycle costs or deliver the biggest lifecycle benefits,' he says (see box below).

He adds that financial expertise in building up business cases will be vital. But he warns that finance will need to assess business cases over a longer horizon. 'A focus on payback periods alone is probably unhelpful,' he says. 'The net present value and overall lifecycle costs are also very important. Some of the bigger carbon-saving projects, such as major refurbishments or more energy-efficient new builds – rather than simply complying with building regulations – may over 20-30 years have a big net benefit, but may take eight to nine years to pay back. So it is important to appraise investments on both lifecycle costs and payback.'

But while investment appraisal horizons may need to lengthen, Mr Pryce says it is also important to look for quick wins, such as replacing old lighting systems with T5 fluorescent tubes.

Cutting carbon should be a win-win situation – helping the NHS meet its carbon reduction targets and reducing costs for NHS organisations. But some projects may need investment upfront or may involve a longer payback period. It will be important to recognise the importance of cutting carbon and not see carbon reduction budgets as an easy cash-releasing efficiency saving to meet short-term goals.

BUSINESS CASE EVALUATION/CARBON PRICING

The government has started factoring in the cost of carbon when evaluating policies or business cases. The aim is to ensure it takes full account of climate change impacts when considering public policies and projects, whether the projects lead to an increase or decrease in emissions. It originally adopted a shadow price for carbon (SPC) that was effectively based on the social cost of carbon (SCC – the cost of the damage caused by emitting one further tonne of carbon). This estimate was drawn from the Stern Review of the economics of climate change, which reported in 2006.

Following a major review, concluded in July 2009, a new approach has been adopted that uses the cost of mitigation as its base rather than the cost of damages. Different carbon values are used depending on whether the emissions come from organisations that are part of a carbon trading scheme or operating outside one.

This is still seen as a mechanism for central government departments to factor in the real cost of carbon into policy decisions. NHS bodies should already be considering sustainability issues as part of local business case evaluations. Putting an actual price on carbon – based on the emissions generated or reduced by a particular scheme – could provide a way of factoring carbon costs into overall decisions on projects.

This may go beyond using the costs under the CRC Energy Efficiency Scheme. The price of the allowances under this scheme (initially £12 per tonne) could provide a simple price for carbon emissions to be used in business case evaluation. However, if organisations factor in recycling payments from the scheme (see page 11), this would result in only considering a marginal cost of carbon emissions.

Some NHS organisations are factoring in carbon reduction impact into business cases. But in most cases this will be limited to including the direct impact on the energy bill along with some form of qualitative assessment of the contribution to environmental performance. It stops short of putting a cost on the carbon footprint associated with a particular project by establishing a carbon price.

While the Carbon Trust encourages carbon management programme participants to factor in carbon reduction commitment costs into its business cases, it says it is not aware of NHS organisations factoring in a carbon price above and beyond this other than the cost of the energy itself. However, organisations may need to start looking at the ways they evaluate business cases to ensure carbon implications are factored in.

Carbon trading and the CRC Energy Efficiency Scheme

The government has backed up its calls and targets for carbon reduction with legislation. The Climate Change Act 2008 established the government's cap and trade scheme – known as the CRC Energy Efficiency Scheme (formerly known as the Carbon Reduction Commitment) – and this will commence in April 2010.

This is not the first carbon trading scheme to be launched. The European Union Emissions Trading System (EU ETS) has been in operation since 2005.

The EU ETS was aimed primarily at energy-intensive industries such as combustion plants, oil refineries and cement factories. However, some 80 NHS organisations have been involved – all with 20 megawatts or more thermal capacity per site.

Under the ETS, the government sets emissions limits and issues allowances to reflect these limits to all registered installations, with one allowance equating to one tonne of carbon dioxide. Installations can buy and sell these allowances on the open market.

The scheme is currently in its second phase (2008-2012). The idea is that allowances are constrained nationally and then companies are required to keep within their own emissions cap and can sell surplus allowances or use the open market to buy additional allowances.

The new CRC Energy Efficiency Scheme looks to drive carbon reductions in non-energy-intensive sectors, including the wider business market and the public services. First trailed in the 2007 energy white paper, the Climate Change Act contained enabling powers to introduce trading schemes, including the CRC, and a consultation on the draft order ran from March to June 2009. The government provided its response to this consultation in October 2009 and set out its final decisions on key aspects of the new scheme.

This new carbon emissions trading scheme starts in April 2010. Some 20,000 large public and private sector organisations will be involved with the scheme at some level, although most will be required simply to make an information disclosure every few years about their electricity usage.

However, some 5,000 organisations will participate fully and face more onerous requirements to record and monitor their carbon dioxide emissions. More particularly, at the beginning of each year they will have to estimate their emissions for the coming 12 months and buy allowances (from year two) equivalent to these emissions. Differences between these estimates and actual emissions will lead to the creation of a trading market for carbon emissions allowances.

Phases

The CRC has been divided into phases. The initial three-year introductory phase starts in April 2010. The subsequent phases will be seven years in duration (with the first two years of each phase overlapping with the previous phase). Each phase includes:

- Qualification period, in which organisations assess whether they qualify to make a disclosure or participate fully
- Registration period, in which organisations submit their disclosure or register for the scheme
- Footprint year, in which participants monitor their total emissions from energy use and produce a footprint report
- Compliance years (April to March), in which organisations buy allowances for each tonne of CO_2 emitted, based on expected use, and then monitor usage.

Organisations must report their actual emissions by the end of July after each compliance year and surrender allowances to cover their reported emissions.

In the following October, organisations receive a revenue recycling payment based on their performance in the relevant compliance year.

For the introductory phase:

- Qualification year is 2008 (calendar year)
- Registration period is April to September 2010
- Footprint year is 2010/11 (financial year)
- Compliance years are 2010/11, 2011/12 and 2012/13 (financial years)

Those organisations not making the cut in the first phase need to be aware that 2010/11 marks the qualification period for phase two.

Qualification and measuring emissions

The first job for any organisation is to assess whether it qualifies as a full participant in the scheme. Qualification is determined on the basis of electricity

The scheme looks to drive carbon reductions in non-energy-intensive sectors, including the wider business market and the public services

consumption, although the scheme itself covers emissions from all energy use.

The scheme is basically designed to capture any organisation spending more than £500,000 on electricity a year. But specifically, organisations will qualify for the scheme if they have at least one half-hourly meter settled on the half-hourly market and total half-hourly electricity consumption of at least 6,000MWh. (With half-hourly meters consumption is recorded every half hour.)

Organisations meeting the first criteria but not the energy consumption threshold do not have to participate in the scheme fully. Instead they simply make information disclosures. Depending on the size of this consumption (more or less than 3,000MWh), the organisation will either have to disclose the total consumption of half-hourly electricity or simply tick a box on an online form.

Organisations that do qualify need to register (between April to September 2010 for the introductory phase). They will first need to calculate their footprint emissions. (They do this once for each phase. In the introductory phase the footprint year is the same as the first compliance year, 2010/11.) They assess total emissions (from all energy use, not just electricity, but excluding transport and domestic accommodation) and determine the emissions that should be included in CRC.

In practice organisations add-up all their energy use from electricity, gas and other fuels (coal, LPG and diesel for example). Use of estimates rather than original bills, meter readings or delivery invoices will incur an automatic 10% increase. Each source of energy has its own emission factor – multiplying the energy used by its factor yields the emissions.

The emissions included in the scheme are described as 'relevant emissions'. Some parts of organisations, if covered by a climate change agreement, may be exempt from CRC, and subtracting these emissions from the relevant emissions provides an organisation's footprint emissions.

There are further deductions for emissions covered by the EU Emissions Trading System (ETS) and organisations can remove up to 10% of their total footprint emissions in some cases before arriving at their CRC emissions.

At the end of the footprint year, participating organisations have to produce a footprint report giving details of their footprint emissions and their CRC emissions, plus any exemptions through climate change agreements. The report needs to be backed up with an evidence pack including details such as energy consumption and energy sources. Reports are due in by the end of July and there are fines (starting at £5,000) for failure to submit.

There may well be a role in the data collection for finance – given the importance of accuracy in determining the emissions for which the organisation will require allowances and there may be a specific role for an organisation's internal auditor in reviewing footprint and annual reports.

But the main role for finance will come with the transactions around the buying and selling of allowances. Perhaps a first important task will be to understand the accounting entries connected to the emissions allowances (see page 13).

Trading

In effect, organisations need to buy allowances on a yearly basis for their estimated emissions. If they reduce their emissions compared with their estimated total, they will have excess allowances, which can either be traded or banked for future use (no allowances can be banked in the final year of the introductory phase).

During the three-year introductory phase, there will be no limit on the total number of allowances available to buy. But in subsequent phases, the total number of allowances will be capped. All the money raised by the annual sale of allowances is recycled back to participants. However, adjustments are made to these recycling payments based on performance, meaning organisations can face either real additional costs as part of the scheme or financial benefits for the relatively better performers.

The normal routine will be for participants to buy allowances at the start of a year during an April sale period, although there will be no allowances sold in the first year (plans to require organisations to buy allowances retrospectively at the start of year two have been dropped). Instead year one will be a reporting year only. Once allowance buying gets under way, a fixed price of £12/tonne of CO_2 will be used for the remainder of the introductory period.

If organisations subsequently need to buy or sell allowances, they can do so by trading on a

All the money raised by the annual sale of allowances is recycled back to participants, with adjustments based on performance

WEIGHTINGS FOR CRC METRICS

Metric	Year 1	Year 2	Year 3
Absolute metric	0%	45%	60%
Early action metric	100%	40%	20%
Growth metric	0%	15%	20%

secondary market or via a 'safety valve' mechanism (effectively buying additional allowances from the government at a rate higher than £12).

Organisations will need to budget for the first cash outlay in April 2011. In subsequent capped phases, allowances will be sold by auction with a clearing price set depending on demand each year.

At the end of each year, organisations will have four months to collate their data, calculating actual emissions and buying any additional allowances required to cover these emissions.

The formal deadline for submitting their annual report is the last working day of July. At this point (apart from after year one) organisations will also have to surrender a relevant number of allowances to cover their actual emissions. Because the first year is a special case, organisations will submit their first annual report (in July 2011) at the same time as their footprint report. Again, there are fines starting at £5,000 for failure to submit a report.

League tables, bonuses and penalties

There is also a performance element to the CRC. The comparative performance of all organisations in the scheme will be published each year as a league table, with an organisation's position in the league table helping to determine its recycling payment.

The league table is compiled after all annual reports have been submitted. Three metrics will ordinarily be used to determine position:

- An absolute metric reflecting change in an organisation's CRC emissions
- An early action metric taking account of energy saving measures before the start of CRC
- A growth metric, which gives credit to expanding organisations growing in an energy-efficient way.

The weightings proposed for the three metrics will change as the scheme progresses, as the table above illustrates.

Participants are ranked for each metric. So if there are 5,000 participants, the best performing participant in each metric will receive 5,000 points, with the worst performer receiving 1 point. The weightings are then applied and metric scores added to give each participant's overall league table score. It should be noted that in year one only the early action metric will be used to derive the league table.

To improve chances of doing well, organisations can voluntarily install automatic meters and attain the Carbon Trust Standard or equivalent accreditation.

The league table will be published after the end of each compliance year. As an incentive to reduce emissions, all the revenue raised by the annual sale or auction of allowances will be recycled back to participants, with league position impacting on the amount received.

Recycling payments are calculated based on three things:

- The amount of money collected in the most recent sale/auction
- The participant's proportion of the total 2010/11 emissions – the recycling baseline
- A bonus or penalty based on league table ranking.

Maximum bonus/penalty rates have been set for the first five years of recycling payments rising from ±10% in the first recycling payment to ±50% in year five (see table below).

Phase	Year	Bonus/penalty rate	Bonus/penalty based on league position in (year)	Total recycling pot from allowance sale in (month)	When paid
Introductory	2010/11	–	–	–	–
Introductory	2011/12	± 10%	2010/11	Apr 2011 (covering 2011/12)	Oct 2011
Introductory	2012/13	± 20%	2011/12	Apr 2012 (covering 2012/13)	Oct 2012
First capped	2013/14	± 30%	2012/13	Apr 2013 (covering 2013/14)	Oct 2013
First capped	2014/15	± 40%	2013/14	Apr 2014 (covering 2014/15)	Oct 2014
First capped	2015/16	± 50%	2014/15	Apr 2015 (covering 2015/16)	Oct 2015

The comparative performance of all organisations in the scheme will be published each year as a league table

EXAMPLE OF FIRST RECYCLING PAYMENTS COVERING 2010/11 REPORTING YEAR

(taken from *Consultation on draft order to implement the carbon reduction commitment: government response and policy decisions,* October 09)

Reporting period: 2010/11
League table publication: October 2011
Revenue raised in government sale: £94,080
Maximum bonus/penalty for reporting period: ±10%

2010/11 REPORTING YEAR

Company	c	f	a	h	b	d	g	e	j	i	Totals
2010/11 emissions	100	2000	1000	100	250	2700	200	300	1200	1000	8850
Baseline % of total	1.13	22.60	11.30	1.13	2.82	30.51	2.26	3.39	13.56	11.30	
Early action score	100	90	75	65	54	36	35	25	18	10	
Position in league table	1	2	3	4	5	6	7	8	9	10	
Purchased allowances in govt sale 2011/12	90	2200	850	0	270	2000	290	240	900	1000	7840
Sale to cover predicted 2011/12 emissions (£)	1,080	26,400	10,200	0	3,240	24,000	3,480	2,880	10,800	12,000	94,080
Bonus of penalty (%)	9.89	7.51	4.12	2.88	2.49	-0.85	-4.12	-4.69	-6.38	-8.87	
Recycle payment 2011 (£)	1,168	22,859	11,069	1,094	2,724	28,459	2,038	3,040	11,942	9,688	94,080

Recycling payment for organisation c = 0.0113 x £94,080 x 1.0989
[baseline % of total emissions] x [total pot in most recent allowance sale] x [bonus rate]
Bonus rate = 100% + bonus %

It is simple enough for each organisation to calculate its maximum potential bonus/ risk

However, calculating the size of revenue payment is not straightforward. In particular an organisation does not simply receive back the amount it paid in the most recent allowance sale plus or minus a bonus.

The starting point is instead the organisation's baseline emissions as a proportion of all baseline emissions. This percentage is applied to the total pot collected in the most recent allowance sale and then adjusted by the organisation's specific bonus.

To put it another way:

> Recycling payment = proportion of baseline x revenue raised x specific bonus

The real unknown is the bonus. This clearly relates to an organisation's performance as measured in the league table. Not only is it impossible to predict an organisation's absolute position in the table, an adjustment also has to take account of the distribution of different size organisations across the league table to ensure that the recycling payments add up to the total pot available. This adjustment process is relatively complicated.

However, it is simple enough for each organisation to calculate its maximum potential bonus/risk. All it needs to know is its relative proportion of baseline emissions and the total collected in the annual sale of allowances.

Applying its baseline percentage to the total pot available and adjusting by ±10% will give the maximum range of recycling payments it faces. An example of first recycling payments covering 2010/11 is shown above.

Further explanation of the recycling payment calculation is given in annex D of *Consultation on draft order to implement the carbon reduction commitment: government response and policy decisions*.

A more detailed explanation is expected to be published by the Department of Energy and Climate Change alongside revised CRC guidance towards the end of 2009.

ACCOUNTING FOR THE CRC ENERGY EFFICIENCY SCHEME

(prepared with support from KPMG)

This is a developing issue and it is not possible to provide definitive guidance at this time. The scheme rules are complicated and there are still a number of uncertainties about how they will work in practice. Individual circumstances will need to be examined to achieve an acceptable accounting treatment for any organisation.

However, the principle challenges in accounting for the CRC will be in determining the figures to be recorded and the timing of their recognition, particularly given the uncertain impact of the recycling payment system on the net costs of the scheme for organisations.

Now that 2010/11 has been declared a reporting year only, NHS trusts may not have to start accounting for the CRC until April 2011 (the start of the second full year of the scheme – 2011/12).

- At the start of the year organisations are able to purchase allowances in advance for the coming year at £12/tonne of CO_2. They will record a cash outflow and probably an intangible asset representing the allowances purchased.

- As trusts emit they will need to recognise an expense to cover the cost of the allowances that will need to be surrendered, with a corresponding liability recorded in the statement of financial position. Assuming the allowances acquired at the start of the year are retained and are sufficient to cover the emissions, the expense will be £12/tonne of CO_2. For any emissions in excess of the allowances held, the expense is measured by reference to the prevailing market price.

- On surrender of the allowances in the following July the asset and liability are removed from the statement of financial position.

However, this is complicated by the recycling payment system, which will see trusts receive a payment that could be more or less than they paid for their allowances. The recycling payment is based on total receipts into the scheme and an organisation's emissions in 2010/11, adjusted by a bonus or penalty payment based on performance in subsequent years.

When should the recycling payment be recognised? Is it a grant? At what point has it been earned? This has yet to be determined and will need careful interpretation of the scheme rules.

Once the recognition hurdle has been crossed accurate estimation of an organisation's likely repayment will also be a challenge. The recycling payment will be calculated based on relative performance in comparison to other organisations in the scheme as measured by performance metrics and published in a league table. However, the maximum penalty/bonus levels are announced in advance.

If a trust has concluded that it should recognise the recycling payment and it can demonstrate that the estimate of the level of the payment is sufficiently robust then it may be able to reflect this as income and include the payment within the statement of financial position as an asset under trade and other receivables.

In October when the recycling payment is received it will be reflected in cash.

The trust should assess at each reporting date whether there is an indication that the carrying value of any allowances held (intangible assets) in the statement of financial position are impaired. If there is an indicator of impairment then an impairment test should be completed and the assets written down if their resale value or value in use is not higher than the carrying value.

This may be an issue at the end of year two or three, if organisations have purchased allowances in advance that prove to be in excess of their actual requirements and cannot be carried over to the start of the capped phase or sold for at least their carrying value.

** (This note on accounting treatment represents initial thoughts on accounting for the scheme based on information available. It is not intended to be an exhaustive summary of all scenarios and should not be relied upon.)*

Auditors' interest in carbon

One indirect reason why NHS finance managers need to take a greater interest in climate change and carbon reduction is that their organisations' external auditors are taking a greater interest.

NHS trusts face assessment under the auditor's local evaluation (ALE). The use of resources assessment (UOR) for primary care trusts – under the wider comprehensive area assessment system – concerns itself with the use of all resources, not just finance. While this assessment covers a number of broader areas, both it and ALE are widely seen as measures of financial performance. Increasingly the actions being taken by NHS bodies to address environmental issues are having an impact on their assessed performance under ALE and UOR.

NHS bodies and their boards should be pursuing carbon reduction because it is the right thing to do and because it makes business sense. But the inclusion of environmental performance issues within the audit framework clearly provides its own driver for finance and other managers to ensure these issues are addressed.

While PCTs' new use of resources assessment explicitly assesses an organisation's use of natural resources, auditors' interest in environmental performance has been growing for a number of years.

The inclusion of environmental performance issues within the audit framework clearly provides its own driver for finance and other managers

ALE – NHS trusts

The auditors' local evaluation (ALE) was introduced by the Audit Commission in 2005/06, covering both primary care trusts and NHS trusts, to assess how well NHS bodies manage and obtain value for money from their financial resources. ALE assesses performance in five themes:

- Financial reporting
- Financial management
- Financial standing
- Internal control
- Value for money.

Until 2007/08, the overall ALE assessment provided the quality of financial management score for all non-foundation trust organisations used within the Healthcare Commission's annual health check (from 2008/09 the health check financial assessment is known as quality of financial management).

PCTs faced their last assessment under ALE in 2007/08 and were assessed under the commission's new use of resources framework for 2008/09. But ALE continued to be used as the quality of financial management assessment for NHS trusts in 2008/09 under the health check framework, now overseen by the Care Quality Commission.

Foundation trusts are not assessed under ALE (or the commission's new use of resources framework). Instead their health check financial assessment is provided by the financial risk rating undertaken by Monitor, the foundation trust regulator. ALE assessments result in one of four scores:

- Level 1 (inadequate performance)
- Level 2 (adequate performance)
- Level 3 (performing well)
- Level 4 (performing strongly).

This overall score is built up from individual 1-4 scores in each of the five themes. The five themes are underpinned by 13 key lines of enquiry (KLOEs) that are in turn supported by detailed audit criteria that describe adequate, good and excellent performance.

The environment and carbon reduction feature in two themes within ALE – financial reporting and financial management – having a direct impact on an organisation's key financial assessments.

In financial reporting, the environmental link is within key line of enquiry 1.2 (*The trust promotes external accountability*). In particular auditors look for assurances that 'the trust includes information and analysis in its annual report about its environmental footprint' – assurance 1.2.5 in 2008/09. This first appeared in the 2007/08 ALE as a level 4 assurance but moved to a level 3 assurance in 2008/09 – an indication that this should be moving towards common rather than best practice. For 2009/10 this is now a level 2 assurance.

In financial management, within KLOE 2.3 (*The trust manages its asset base*), there were two level 3 assurances for 2008/09. Assurance 2.3.6 looked for whether 'the trust has carried out an energy site survey (using the NHS Environmental Assessment Tool) and produced a local energy strategy and action plan'. Assurance 2.3.7 asked if 'the trust can demonstrate it is committed to the sustainable use of resources and has plans in place to reduce use of energy and other natural resources, minimise production of waste and contribute to the sustainable development of the wider community'. Both assurances first appeared in 2007/08, with assurance 2.3.7 moving from a level 4 to a level 3 in 2008/09.

In line with the policy of increasing pressure on environmental issues, the 2009/10 assessment moves the KLOE demonstrating commitment to sustainability to a level 2. (With the NHS Environmental Assessment Tool having been withdrawn, this 'site survey' KLOE has also been removed.)

Use of resources – PCTs

The auditors' assessment of PCTs changed for 2008/09, with ALE being replaced by the Audit Commission's new use of resources assessment. PCTs' quality of financial management score in the annual health check, undertaken by the Care Quality Commission, is derived from aspects of this new use of resources assessment.

This takes a much wider definition of 'resources' – looking at how PCTs manage their finances, govern the business and manage resources (including natural resources, physical assets and people). Natural resources are defined as: energy, clean water, clean air, land and soil, and materials and minerals. The 'managing resources' assessment involves much greater scrutiny of what PCTs are doing to understand their energy consumption and carbon footprint and what they are doing to reduce their impact on the environment.

Arguably this increased scrutiny would be better applied to acute trusts, the health service's major users of energy, rather than asset-light commissioning bodies (although by covering PCTs it does capture PCT provider arms).

However, the continued application of ALE for NHS trusts recognises the plan for all trusts to become foundation trusts and that switching to a new assessment for a short period of time would make little sense.

As with the ALE framework, the use of resources assessment for PCTs sets out key lines of enquiry (10 in total) spread across the three themes of managing finances, governing the business and managing resources.

Auditors use the KLOEs to make their assessments and they are scored using the same 1-4 scoring system as used in ALE (see facing page). Once a score has been assigned to each KLOE, the theme score is calculated by taking an average of the KLOE scores within the theme.

The commission has deliberately moved away from the approach of setting out a matrix of assurances for the various levels within each KLOE. This is to address criticisms that ALE was too much of a tick-box assessment. There are no detailed assurances published for each KLOE in use of resources. Instead auditors have been provided with guidance in a narrative format setting out the focus for each KLOE and then providing general details of what auditors might expect to see at level 2 (getting the basics right) and level 3 (performing well).

There are 3 KLOEs in the managing resources theme (covering natural resources, asset management and workforce). KLOE 3.1 (*Is the organisation making effective use of natural resources?*) is the KLOE relevant to carbon reduction.

There are three focus areas in KLOE 3.1 for PCTs, which are required to show that they:

- Understand and can quantify their use of natural resources and can identify the main influencing factors
- Manage performance to reduce their impact on the environment
- Manage the environmental risks they face, working effectively with partners.

The KLOE pushes PCTs to move beyond the environmental requirements looked for under ALE. At a basic level (level 2), on quantifying and understanding use of natural resources, it looks for

PCTs to demonstrate a clear understanding of their own carbon emissions, water use and other resource consumption. The PCT should also be engaging with staff and gaining their commitment to the PCT's approach to reducing the impact on the environment.

Organisations performing well (level 3) would also be prioritising action in areas where they produce the most carbon and would be able to demonstrate that other corporate plans (such as finance and human resource plans) support the delivery of their environmental impact reduction strategy.

And in terms of reducing impact and managing risks, auditors expect a level 2 PCT to have established systems and processes to reduce use of energy, fuel and water by reducing demand and improved efficiency. Targets would also be expected to be in place.

At the higher level, PCTs would expect to be demonstrating progress against their environmental strategy in line with their targets. In addition sustainability impact appraisals would be expected for all major projects and programmes. Where these assessments flagged up potential negative impacts, PCTs would be expected to demonstrate how they had responded, for example, by changing policy, mitigating the risks or having a plan to manage the effects.

At this level PCTs would also be expected to demonstrate that they were considering the environmental impact of their suppliers of goods and services within procurement decisions.

However, while the new assessment structure was in place for 2008/09, PCTs were not assessed on KLOE 3.1 in the first year. It was considered that workforce planning and management was a higher priority issue for PCTs, which allowed them a further year to prepare for the assessment of natural resources and get the mechanisms and processes in place to demonstrate performance.

A future role for auditors?

Carbon emissions and other environmental performance data is becoming increasingly important. Not only is the accuracy of data important in assessing an organisation's and the health service's progress towards targets, but it will also impact on financial payments under the CRC Energy Efficiency Scheme's performance regime.

The CRC Energy Efficiency Scheme already includes audit procedures. These will lead to 'a proportion' of organisations being audited each year, selected using an assessment of their risk of non-compliance.

However, all organisations will be audited during the scheme. If information is reported incorrectly, organisations will pay a penalty of £40 for each tonne of CO_2 incorrectly reported.

But auditors could play a bigger role. Foundation trust regulator Monitor consulted at the end of 2009 on additional reporting requirements that FTs could have to include in their 2009 annual reports. If these get the go-ahead, FTs would have to include a separate section in their annual reports entitled 'sustainability'. This would initially cover a summary of performance data on waste minimisation and management and use of finite resources.

But Monitor has made it clear that it is looking to include greenhouse gas emissions data (non-financial and financial) for 2010/11. This would put FTs one year ahead of the date by which this reporting would be mandatory for all public sector organisations, according to Treasury proposals on sustainability reporting, also consulted on towards the end of 2009.

Monitor is not proposing to impose a requirement to obtain external assurance on the sustainability disclosures for 2009/10. But it said it would consider this for the 2010/11 annual report and accounts.

However, FTs are expected to undertake an internal audit review of the systems that produce the data for inclusion in the annual report and accounts.

Monitor has made it clear that it is looking to include greenhouse gas emissions data (non-financial and financial) for 2010/11

Case studies

Wrightington Wigan and Leigh NHS Foundation Trust

'In finance we end up being the conscience of the organisation. We see things objectively, we see things independently and we see things trust-wide – and that's the beauty of the finance function.' And, according to Keith Griffiths, finance director at Wrightington, Wigan and Leigh NHS Foundation Trust, that is one of the key reasons why finance has a major role in promoting and securing significant reductions in carbon emissions from across the NHS.

He recognises that much of the carbon reduction programme will be led from the estates department – the traditional home for an organisation's utilities management operations – although he suggests that the boundaries dividing responsibility for carbon reduction are becoming – and need to become – blurred. But he says finance has a big part to play.

Mr Griffiths explains: 'If there are things that we can pick up from the estates and facilities team, then the finance function has the ability to translate that and communicate it to other parts of the organisation in a consistent way. And our analytical capabilities mean we can provide the evidence and figures to back up these messages.

'The finance department has the right skill sets but we also have significant influence around the organisation with access to the senior management team. That can be important in getting leadership from around the organisation to take these programmes forward.'

He adds that finance's experience in reporting – through taking responsibility for robust information published in the annual report and accounts – will be an important asset as environmental reporting becomes more comprehensive and compulsory.

Wrightington Wigan and Leigh, which gained foundation trust status in December 2008, is no newcomer to carbon reduction. Recognition of its importance has been growing for several years. But an initial approach that could be described as piecemeal, with carbon reduction and reducing energy costs looked at as part of specific key service and site redevelopments, became more strategic and integrated during 2006/07.

That is when the trust became one of the first organisations to sign up to the Carbon Trust's NHS carbon management programme. The national programme, in operation since 2006, aims to provide trusts with the technical and change management support to develop a carbon management plan and cut energy costs and carbon emissions.

Wrightington Wigan and Leigh's new boiler house has made a huge difference to the trust's overall footprint

Its overriding aim is to embed carbon management across the whole organisation, and Chris Murphy, business development manager within the FT's estates division, believes it has achieved this. 'Carbon reduction was already part of our discussions, particularly around plans to upgrade our estate,' he says. 'But the Carbon Trust programme helped drive it forward and, while momentum had been gathering, we felt a bit more of a kick when the Carbon Trust came on-board.'

Mr Murphy says the basic role of the Carbon Trust is to 'speed things up' that would have taken longer because of the lack of specific carbon reduction expertise at the hospital. But he says that having an executive sponsor at the trust – in this case Mr Griffiths – was a real asset in getting top level buy-in and ensuring progress was made.

The programme provided structure to the trust's efforts and probably for the first time got them thinking about carbon reduction in terms other than just building more carbon efficient facilities.

When it started out on the programme, the trust had a baseline carbon footprint of some 18,000 tCO_2 across its four sites. One of the key initiatives that emerged from the work was the replacement of an old, coal-fed boiler house. This plant, which provided steam for the

Leigh Infirmary, accounted for one third of the trust's baseline emissions, reflecting the higher emissions connected to coal rather than gas fired power and steam plants.

On its own, the replacement of this plant with a modern, energy-efficient unit slashed 4,000 tCO_2 off its footprint. With £1m support from the Department of Health and £2m from the trust's own capital funds, the plant now delivers £200,000 of savings a year compared with previous energy costs, based on energy costs at the time. Rising fuel costs have negated these savings in terms of the absolute fuel bill, but in avoiding these higher energy costs, the real savings are greater than £200,000. For the trust, the case stacked up financially and environmentally – although a 15-year payback, ignoring the wider benefits, may have put other trusts off.

Although the trust would probably have replaced its boiler plant without the Carbon Trust's involvement, the specialist support and ideas from other programme participants meant the trust ended up with a more comprehensive and detailed solution.

It also took Wrightington into areas it hadn't previously looked at. Sub-metering was one of these – giving the trust a much clearer understanding of where it was using its energy. This was not just applied at Leigh but across all four sites and has provided an opportunity to understand exactly where the trust's energy is being consumed, identify high energy users and target improvements accordingly.

Sub-metering has given the trust an opportunity to understand where energy is being consumed, identify high energy users and target improvements

'We took the principles from the boiler plant project and applied them across our other sites,' adds Mr Murphy. 'Now we have a lot more control and knowledge about what goes on – who uses what and what to expect over the year. It helps us operationally, financially and helps us to reduce our emissions.'

'It can be difficult to get people excited about or involved with energy reduction, particularly if they work in a clinical area, where they expect buildings to be warm and hot water to be in the taps, while [if they are looking for efficiencies] they focus their expertise on saving money elsewhere,' says Mr Griffiths. 'What sub-metering is doing is giving transparency over what they control locally. That has been helpful to be able to have that kind of conversation with them at the same time as they are being encouraged to conserve energy in their own homes.'

He adds that sub-metering has enabled the trust to directly attribute costs to individual service lines, although apportionment is still needed for 'shared' facilities. The trust is moving towards service line reporting underpinned by patient level costs with its first reports using patient level data having gone live in June 2009. 'The evaluation of energy to patient level by department is part of that step change [in moving to service line reporting] and where we can we will use it to populate the model,' Mr Griffiths says.

Mr Murphy emphasises the importance of making links with messages being delivered through the media about the importance of energy conservation in general, getting people to apply actions that might be commonplace at home to the workplace. One message delivered locally is that turning off all PC monitors would save enough energy to cook 15,000 meals (IT technologies will now make the switch-off of all PCs the 'default' position).

Mr Murphy says the trust has ambitions beyond its own walls, hoping that its campaign within the hospital – through newsletters and posters – will reach a wider audience including staff, patients and visitors, who will apply energy-saving measures at home as well as in the workplace.

During summer 2009, the trust committed to the 10:10 campaign to cut carbon emissions during 2010 by 10% compared with 2009 emissions – that's 10% off an expected 12,000 tonnes CO_2. As with all organisations looking to cut carbon, this will get progressively harder as 'easy win' opportunities fall.

The trust has pursued a range of initiatives to date, from educational schemes – encouraging staff to turn heating down before opening a window, for instance – to capital backed projects – more sophisticated lighting and heating control systems. It is looking at other schemes, such as installing ground source heat pumps and rain water capture systems.

Ground source heat pumps can be expensive upfront and have a relative long payback period compared with more traditional heating sources. But Mr Griffiths is clear that the trust needs to explore its options. 'We need to be considering the long term, including the political agenda,' he says. 'Who can say whether in future there will be penalties applied if organisations are not at a certain level? Projects [such as ground source heat pumps] may be difficult on our own resources to crack on with, but we have to know the options before we dismiss them.'

In total the foundation trust estimates it has released more than £350,000 of energy savings since getting

involved with the Carbon Trust. But it needs to do more, both to meet its own 10:10 target and the wider NHS and UK targets. All aspects of the business need to contribute. One way in which this is being encouraged is through the business case process, which has been changed in the past year. 'We've used the business case process to get more engagement from all key players in the organisation,' says Mr Griffiths. 'A business case won't get considered by the executive team unless it has been signed off by the estates team.'

The trust takes carbon reduction very seriously. And it is not just focused on what is being measured. For instance, carbon footprints are based on gas and electricity usage, but the trust is also looking at options to conserve other natural resources – it is looking at rain water capture systems.

And it recognises that its role has to be about more than just reducing its carbon use on site. As with the NHS generally, the biggest contribution to its full carbon footprint comes from procurement. There may be tension between the drivers to procure locally, so reducing carbon footprint, while using procurement hubs to buy collectively to secure the best price. But Wrightington Wigan and Leigh recognises it is a major area for improvement. It is already buying locally (within a 25-mile radius) for its catering needs and is looking at opportunities to expand this sustainable procurement approach.

Despite the trust's success in carbon management, it accepts there is much more that can be done. Areas such as waste management and the trust's transport fleet are areas on which the trust will focus its attention, as well as energy/utility-based carbon generation. The trust's aim is to 'continue to influence staff through operational principles within these areas that will help them, in turn, apply them to their home environments and feel the benefits'.

Avon and Wiltshire Mental Health Partnership NHS Trust

Paul Miller, finance director of Avon and Wiltshire Mental Health Partnership NHS Trust recognises the drivers included in this briefing that are pushing NHS bodies and finance managers to take a closer interest in carbon reduction. Efficiency, the CRC Energy Efficiency Scheme and the audit regime are all focusing attention on green issues. But he adds a fourth – staff pressure.

'In the work that we've done to involve staff in our strategic priorities, the message back is that the environment matters to them so it is important to take a positive role,' he says.

Mr Miller says finance directors have an important role in carbon reduction. 'It is vital that the finance director publicly supports this agenda,' he says. 'It can be very easy for an organisation to focus on the short term. But carbon reduction is a short-, medium- and long-term project. It can be very easy for this to be marginalised when looking at straight financial balance and next year's efficiency programme. There needs to be a clear message that sustainability and carbon reduction is as important as the urgent issues. If the finance director doesn't back this, then you won't get the focus.'

Mr Miller believes finance managers will need to develop new skills to support this agenda. For a start the CRC Energy Efficiency Scheme will force finance into a trading role, buying and selling carbon allowances in line with estimated and actual emissions. But he believes finance will also have a role in factoring carbon impact into decisions around capital projects.

Increasing carbon reduction and sustainability will need to be factored into business case evaluation, he says, alongside the impact on service quality and payback. At the moment he describes his trust as being at the 'consciousness' rather than the quantification stage. What he means is that the direct impact on energy bill would be considered and qualitative issues would be discussed. But there

> *"It can be very easy for an organisation to focus on the short term. But carbon reduction is a short-, medium- and long-term project"*
>
> **Paul Miller**

Avon and Wiltshire's petrol-free community health team

would be no hard numbers – no carbon price – attached to the carbon footprints of the various options. But he believes this is the inevitable direction of travel.

Mr Miller is clear on the role for finance. 'It is not a professional finance issue that we should lead on,' he says. 'It is an organisational responsibility, with specific key roles for strategy and estates teams. But finance needs to be really supportive. We need to understand the importance and communicate that across the organisation.'

Mr Miller acknowledges that pathway redesign – producing pathways that deliver better, more convenient services that eliminate waste and reduce cost – will be important for the whole health service in the coming years. 'Carbon reduction won't drive these changes on its own, but the goals are complementary,' he says, adding that a carbon reduction angle can also help sell these service changes to staff.

As a mental health trust, Avon and Wiltshire has a different set of challenges to those of an acute hospital, where the majority of activities are likely to be concentrated on one or two large sites. The trust's estate covers nearly 100 different buildings spread across the local health economy and a large proportion of its services are also delivered in the community. Given this, reducing its existing carbon footprint (9,240 tonnes of CO_2 in 2007/08) is likely to involve making many small improvements as well as larger service and estate changes. One initiative that has had some success is the creation of the city's first 'no petrol' community health team, which runs a fleet of bikes, electric bikes and an electric car.

In Bristol the PCT discussed a CQUIN target that would have required local hospitals to undertake various types of data gathering

Bristol Primary Care Trust

Primary care trusts may be minor users of energy compared with major acute hospital sites. But they can exert influence on their acute providers through the commissioning process.

In Bristol the primary care trust discussed a CQUIN (commissioning for quality and innovation) target that would have required local hospitals to undertake various types of environmental data gathering. The target did not make the final cut in the 2009/10 commissioning round, but is likely to be back on the agenda in 2010/11.

The approach is characteristic of the PCT's approach to carbon reduction and sustainability. It has been actively pursuing this agenda for a number of years. A dedicated climate change and sustainability steering group has overseen the development of a carbon reduction and sustainability action plan. And the organisation is in the final stages of its good corporate citizen assessment. It is even considering shadowing the carbon reduction commitment trading scheme, as it believes it fits with its commitment to cut carbon and could help reinforce its efforts.

As well as making direct reductions in its own footprint, the PCT recognises it has an influence beyond its own boundaries and is keen to lead by example. For instance, as part of an initiative to cut its own carbon footprint, staff have been briefed on how to assess their own carbon footprints, so they can put carbon reducing measures into action at work and at home. And while, to assess its carbon footprint, it needs to consider staff 'work' miles, it is also looking at how it can collect information about patient miles.

The current focus for the organisation is the 10:10 challenge – a commitment to cut its carbon footprint by 10% in 2010. Bristol is just one of a handful of PCTs that have taken up this challenge, coordinated for health bodies by the Campaign for Greener Healthcare. It is collecting data to calculate its carbon footprint for 2009/10 ahead of go-live in April 2010. The specific aim is to cut its carbon footprint in 2010/11 by 10% compared with 2009/10.

Finance director Deborah Hayman believes finance staff have a big role to play in cutting carbon. Currently the trust is engaged with the data collection exercise to determine the baseline for the 10:10 challenge. For instance, the PCT knows its travel expenditure in aggregate – around £1.3m, which includes the significant services it hosts and which equates to about £200,000 for its commissioning function – but it needs to be able to drill down into this to examine the mileage involved and the form of travel. As well as actually establishing the carbon footprint, this will enable it to compare the costs and carbon impact of different travel arrangements.

'We are looking to put costs against some of these items,' says Ms Hayman. While most of the information is collected – for instance, through travel expense claims – it is not all easily accessible or analysable by current systems. Bristol believes it

won't be alone in trying to access this sort of data, so it is also looking to provide feedback to the Department of Health on how the electronic staff record could be amended to make this sort of information easier to get at.

Finance has also been involved in negotiating carbon cutting schemes such as a car club, bicycle subsidies and bulk purchasing on bus passes. However, Ms Hayman believes finance will need to start helping the organisation to factor in the carbon impact into business case evaluations or service decisions. She believes the move to carbon trading, with a real cost for carbon emissions, will force the costs of allowances to be factored into business cases. But she thinks things have to go much further.

'We've been having these conversations about how we move from a financial economic model to a more sustainable model,' she says. In Bristol, a weighting is factored into evaluations, which include internal business cases as well as full tenders, for carbon reduction and sustainability. This remains a non-financial weighting – there is no price put on the carbon footprint of each proposal – but it at least means that the carbon impact is considered.

Nik Attryde, the PCT's sustainability lead, believes finance has a role in helping the PCT to deliver services in a more environmentally friendly way and has been discussing ways to do this with the PCT's provider of community services, Bristol Community Health. The provider supplies over 40 services in the community and provides care in people's own homes including services such as district nursing, palliative care, intermediate care, walk in centres and physiotherapy.

Sue Field, managing director of Bristol Community Health, says the community services provider recognises its responsibility to reduce its carbon footprint and is taking proactive measures. 'We have recently introduced a programme of service transformation, which, as a key part of its remit, will look at rationalising team bases, structures and clinic locations to ensure we continue to address our carbon footprint as a priority,' she says.

In 2008 the average total travel time for a district nurse in Bristol Community Health (travelling to and from patient homes) ranged between 5.5 minutes and 15.5 minutes. Through improved coordination of patients' appointments and the teams treating them, it has already cut the time that staff need to travel between appointments to between 4 and 11 minutes. It plans to continue to improve on this through the next year to help meet its 10:10 and efficiency targets.

Bristol Community Health is also working towards linking up all its community services on the RiO database system, reducing the need to travel to different bases to input patient data. And it has recently produced maps of all bases to help staff to plan their travel in the most efficient way.

Ms Hayman adds that some of the current challenges facing PCTs are pushing in the same direction. For instance, encouraging more exercise, such as walking or cycling, will help with the public health agenda as well as reduce emissions. This in turn will help with the efficiency challenge, as patients avoid future need for gastric bands or renal transplants or avoid heart problems. 'The more people exercise or improve their diet, the less of a time bomb there is for the future,' she says. 'But how do I cost that? Finance has a role in finding values for those things we are not currently valuing because they do have a finance value.'

She acknowledges that the current economic climate makes it more difficult to take forward plans that involve short-term investment and long-term payback. 'The next three to five years will be about early changes around energy, travel, procurement and getting IT that helps us work more effectively,' she says. 'We need to make lots of quite quick, small steps. That is the way forward.'

Encouraging more exercise, such as walking or cycling, will help with the public health agenda as well as reduce emissions

Bristol's finance team has set out carbon-cutting schemes such as bicycle subsidies

Appendix: where to start with energy efficiency

The Carbon Trust has produced ideas to help hospitals increase their energy efficiency and cut costs. In *Hospitals: healthy budgets through energy efficiency*, the Carbon Trust says a significant amount of hospitals' energy consumption is wasted. By minimising this waste, the service can not only save money but also reduce its carbon footprint and create better conditions for patients and staff. The trust outlines a number of opportunities to save energy where it is consumed:

Heating and hot water

Trusts could save up to 30% on heating costs by implementing a number of simple measures:

❒ Encourage staff to report areas that are too hot, cold or draughty and and act on this information

❒ Stick to recommended temperatures

❒ Check temperature controls regularly and thoroughly

❒ Zone areas with different time and temperature requirements by giving each separate controls

❒ Keep the heat in by ensuring external doors are open only when necessary. Automatic doors or a draught lobby can be installed and, ideally, one set of doors should close before the other opens

❒ Maintain heat circulation by ensuring radiators and vents are not obstructed

❒ Service boilers regularly, which can save up to 10% of annual heating costs. A gas-fired boiler should be serviced once a year, while an oil-fired boiler needs a service every six months. Boilers, hot water tanks, valves and pipes should be insulated

❒ Fit thermostatic valves on each radiator to localise control of room temperature

❒ Upgrade time controls

❒ Consider combined heat and power, which can reduce hospitals' energy bills by 20% to 30%

❒ Use water-saving devices such as tap restrictors, push taps, water-efficient shower heads and infrared controllers, which restrict water flow, reducing waste

❒ Consider installing point-of-use water heaters to supply hot taps in isolated areas that are used infrequently

❒ Maintain water services, including taps and pipework

❒ Encourage staff to report dripping taps, overflowing cisterns and so on.

Ventilation and air conditioning

❒ Avoid the use of mechanical ventilation by opening doors, windows and vents. However, consider security when doing so. Some hospitals use 'mixed mode' systems, where buildings use natural ventilation, heating and cooling where possible and mechanical systems where needed

❒ Set a 'dead band' – a wide gap between the temperatures at which heating and cooling cut in

❒ Maintain the systems regularly

❒ Use variable speed drives on fans

❒ Build energy management systems, which can reduce costs by 10% or more. These are based on a network of controllers, feeding back information to a central computer monitoring point

❒ If your trust already has a building energy management system, review the settings to ensure they are still appropriate for usage patterns and that energy is not being wasted.

Lighting

Lighting can account for more than 20% of total energy use or more than 35% of electricity use in a typical hospital. While good lighting is essential for staff to care for patients, savings are possible:

❒ Encourage staff involvement in a 'switch-off' campaign using posters and stickers. Make a staff member responsible for checking lights at set times

❒ Label light switches to help staff choose only those that are needed

❒ Lighting levels can fall by 30% in two to three years without regular maintenance. Keep fittings, windows and skylights clean and encourage staff to install low energy lighting and replace old fluorescent tubes with triphosphor coated ones.

❒ Specify high-frequency fluorescent lighting system and mirror reflectors when installing a replacement for old-style fluorescent tubes

❒ Maximise the use of daylight by wiring so that lights closest to the window can be turned off

❒ Use occupancy sensors in areas such as intermittently used offices, toilets and storerooms

❒ Use ultra-efficient lighting such as light emitting diode (LED) lights.

Office equipment

Office and small power equipment, such as toasters, TVs and vending machines, can account for more than 10% of total electricity used in healthcare organisations but steps can be taken to minimise their electricity use:

❒ Turn off and power down equipment when it is not in use

❒ Fit seven-day timers to photocopiers and printers to ensure they are not left on out of office hours

❒ Heat-emitting equipment such as printers and photocopiers should be placed in separate, naturally

Office and small power equipment can account for more than 10% of total electricity used in healthcare organisations

ventilated areas with good airflow to prevent overheating, remove emissions and reduce noise
❒ Keep heat-emitting equipment clean to maintain effectiveness and ensure cooling down processes are not affected
❒ Remember that the higher purchase cost of some energy-efficient equipment can be repaid through lower running costs.

Catering

More efficient catering facilities can reduce the energy used to create a meal by up to 70%. Better management of energy consumption can be achieved in several ways:
❒ Educate kitchen staff not to preheat equipment too soon, to switch off equipment immediately after use and to keep fridge and freezer doors closed when not in use
❒ Keep in mind running costs when purchasing equipment. Pan sensors on hobs and other equipment that automatically switch off can save up to 25% on energy costs
❒ Use the heat – more than 50% of the heat in warm air expelled from kitchens can be recovered
❒ Maintain and clean kitchen extractor hoods and ventilation units
❒ Use sub-meters to show staff how much energy is being used and to allow for budget charging and allocation.

Specialist equipment

Hospitals have a large amount of equipment that uses a lot of energy. Good housekeeping and careful purchasing can keep consumption to a minimum:
❒ Portable medical equipment can use more energy but this can be minimised by choosing the most efficient equipment, asking staff to turn it off after use and considering local solutions to deal with heat gains from such equipment
❒ Refrigeration equipment should be defrosted and maintained regularly, while temperature settings should be at the correct levels
❒ Use building management system to highlight unexpected use of medical gases and provide local medical gas systems to reduce the energy used in distribution
❒ Make sterilisation and infection departments more energy-efficient by using heat recovery, insulating equipment and metering each major washer and steriliser
❒ Excess heat from laundries can be re-used, while heat exchangers should be used on all types of machine. Consider combined heat and power, and sub-meter the laundry to show how much energy is being used.

Buildings

Typically, two-thirds of a hospital's heat is lost, so the following steps should be taken to minimise this:
❒ Maintain the building, keeping an eye on where heat can be lost, such as gaps in walls or windows, have a regular schedule for checking areas where heat is lost, regularly check for damp and check and maintain insulation
❒ Use curtains and blinds to keep in heat when it is cold and make rooms cooler when it is hot outside
❒ Consider triple glazing, particularly on north-facing or exposed sides of buildings
❒ 25% of heat can escape through an uninsulated roof, so install more insulation during refurbishment.

Combined heat and power

Combined heat and power (CHP) is the simultaneous generation of heat and power in a single process, usually by burning fossil fuels to generate electricity. The heat generated in producing the electricity is recovered and used for space heating and hot water. Hospitals are suited to CHP because of their year-round requirements for electricity and hot water. It can reduce energy bills by 20% to 30%. Fuel input is exempt from the climate change levy and a CHP scheme may qualify for enhanced capital allowances.

The Carbon Trust says hospitals without CHP should consider the following:
❒ The best time to install CHP is when the heating plant is being replaced
❒ A detailed cost calculation is needed
❒ If there is insufficient demand, a CHP scheme could be feasible if heat could be exported to a neighbouring building
❒ Options should be explored for third-party funds.

The Carbon Trust adds that hospitals with CHP schemes should consider the following:
❒ CHP systems must be maintained regularly as part of a planned shutdown – consider the cost implications of the timing and duration of such a shutdown
❒ Monitor the CHP system's performance
❒ Monitoring data can be used to demonstrate compliance with the quality standards to qualify for the CHP climate change levy exemption.

A combined heat and power scheme can reduce energy bills by 20% to 30% and may qualify for enhanced capital allowances