

Taking the temperature

Towards an NHS response to global warming



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Executive summary

Climate change matters. If left unchecked, it will lead to rising sea levels and more extreme and unpredictable weather conditions around the world. The increasing likelihood of more frequent and severe droughts and flooding threaten not only direct loss of lives and livelihoods but also a variety of wider health and social consequences.

In the UK a combination of drier, warmer summers and milder, wetter winters is predicted. There will also be an increase in both the number and extent of extreme events such as floods, heatwaves, droughts and storms. The impacts and costs of such changes in weather patterns will be felt across the whole of society.

The most recent findings from the Department of Health and Health Protection Agency draft report *Health Effects of Climate Change in the UK* confirms and adds detail to concerns that increasing extremes of weather threaten to put severe strain on public health:¹

- more people will be hospitalised as a result of major emergencies
- more frequent and severe heatwaves, could result in an increase in heat-related deaths
- cases of skin cancer and cataracts are likely to increase by 5,000 and 2,000 per year respectively
- cases of food poisoning could increase by 10,000 per year
- a population under climatic stress is more likely to be prone to mental health problems.

The NHS faces a dual challenge. As the leading agency responsible for public health, it needs to invest in preventive healthcare to strengthen the resilience of the population and in treatment for the victims of a warmer, more variable climate.

As one of the world's biggest and most resource-hungry public sector institutions, it needs to act urgently to reduce the significant contribution that its own carbon emissions are making to global warming.

The 2003 energy white paper committed the UK to reducing carbon dioxide (CO₂) emissions to 20 per cent below 1990 levels by 2010 and 60 per cent below 1990 levels by 2050. The latest research suggests that the NHS is a long way from reducing its energy consumption quickly enough to meet these targets.

The sheer scale of the NHS, with 1 million patient contacts every 36 hours, means the organisation has a considerable carbon footprint:

- energy use in NHS healthcare facilities costs £400 million annually and results in a net emission of around 1 million tonnes of carbon
- 5 per cent of all the UK's emissions from road transport are attributable to NHS-related journeys. Staff, patients and visitors travelled almost 25 billion passenger kilometres for NHS-related purposes in 2001, of which 83 per cent were by car or van
- one in every 100 tonnes of domestic waste generated in the UK comes from the NHS, with the vast majority going to landfill.

But this very scale also offers huge potential to make a positive impact:

- if healthcare trusts meet their target to cut primary energy consumption by 15 per cent between 2000 and 2010, the NHS will save £50 million per year on its current energy bills – equivalent to one small community hospital or 7,000 heart bypass operations

- if the 166 acute hospital trusts in England eliminated the estimated 90 kilotonnes of CO₂ emitted each year when idle computers and screens are left on unnecessarily, the carbon emissions saved would be equivalent to those generated by flying over 26,000 people from London to New York and back
- better building design could not only cut energy costs by a quarter but could also increase the productivity of the NHS's 1.3 million-strong workforce by between 6 and 16 per cent
- if domestic and clinical waste were correctly segregated and just 40 per cent recycled, additional emissions savings would be similar to those produced by driving an average-sized car around the equator more than 550 times.

Despite a plethora of headline targets for emissions and energy use, there is a need for detailed strategies to address climate change in an integrated way across the NHS – with ambition to match the scale of the issue.

NHS organisations will want to take a longer-term view and recognise the potential for climate change mitigation and adaptation strategies to deliver multiple health, environmental, social and economic benefits. Procuring hospital food from local producers, for example, not only reduces the carbon emissions associated with air and road freight but also contributes to community well-being and cohesion by boosting the local economy.

There are plenty of examples of good practice across the UK.

- Energy-saving projects such as the installation of a boiler economiser at Glasgow Royal Infirmary, 485 photovoltaic panels at Bronllys Hospital in Powys and a combined heat and power plant at Hartlepool Hospital. As well as cutting carbon emissions, these three schemes alone have delivered total savings of £126,400 per year.
- A two-thirds cut in carbon emissions from road freight and a boost to patient recovery, the local economy and the environment through the sourcing of more fresh, local and organic food by the Royal Cornwall Hospitals Trust.
- A 98 per cent patient satisfaction rate at the new Gateway Surgical Centre in Newham, where carbon-conscious design has reduced energy consumption and holistic planning has led to integration with five local bus routes.
- Creation of a corporate citizenship committee by Gloucestershire Hospitals Foundation NHS Trust, bringing together all the key players in local procurement, transport, facilities management, employment and other areas. The benefits of partnership have included an energy-efficient A&E department, a pilot park-and-ride scheme for staff and patients and 30 per cent local procurement of food.

Taking the temperature concludes with ten key questions where health service managers can take action to put the NHS response to climate change on track.

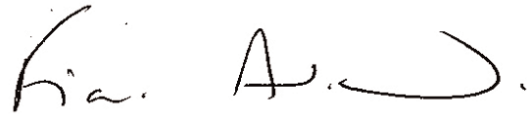
Foreword

Climate change is now recognised as one of the most significant challenges facing the world. As one of the largest organisations in Europe, the NHS can make a significant contribution to the UK's efforts to reduce greenhouse gas emissions and prepare for the major impact that climate change will have. Many of these effects will directly affect the health of the population, particularly the least advantaged in society, through changing the pattern of disease and creating a more challenging and unpredictable environment.

This report makes a strong case for why NHS organisations need to reduce emissions and prepare for the inevitable effects of climate change. Not only is this the right thing to be doing, there is also an economic and public health business case for change and we must make sure that we do not construct perverse incentives that may undermine this.

I am very encouraged by the way NHS organisations are responding to this and the wider sustainable development agenda. The NHS is well placed to provide leadership and to demonstrate what can be achieved in progress towards environmental sustainability. This report shows that there is already much to build on.

The Department is also working to co-ordinate the different strands of work on the wider sustainability agenda and we look forward to working with the health service to learn from the good practice that is going on and to use this to help other organisations and sectors.

A handwritten signature in black ink, appearing to read 'Fiona Adshead'.

Dr Fiona Adshead
Deputy Chief Medical Officer
Director General for Health Improvement

The threat of climate change

“Climate change-related exposures are likely to affect the health status of millions of people”

Intergovernmental Panel on Climate Change, Fourth Assessment Report, 2007

The reality that our climate is changing significantly, and that greenhouse gas emissions are to blame, is now the consensus view among climate scientists.

The scale of the problem

The most authoritative science on the subject of climate change is published by the Intergovernmental Panel on Climate Change (IPCC). Its latest report, published in April 2007², states that it is now too late to avert some degree of climate change.

Retreating glaciers, longer growing seasons, shifts in species ranges and health impacts due to the 2003 heatwave are all cited as examples of climate change already causing disruption in northern Europe. Future warming will magnify these and other impacts, such as large-scale coastal flooding.

Huge volumes of carbon dioxide³ have been released into the earth’s atmosphere since 1850. Global atmospheric concentrations of CO₂ are now at a record high, far exceeding the natural range over the past 650,000 years. While the science of climate change is still developing, the IPCC makes it clear that we are fast approaching an atmospheric concentration of CO₂ that could result in catastrophic climate change.

Sir Nicholas Stern, former chief economist of the World Bank, warned in 2006 in a report commissioned by the Treasury that the impact

“All the things that are good for sustainable development have, directly or indirectly, a positive impact on human health or efficiency savings”

Anna Coote, lead health commissioner, Sustainable Development Commission

on the global economy will be devastating if global warming continues unabated.

In order to prevent dangerous climate change the UK Government has adopted a target of a 60 per cent reduction in CO₂ emissions from 1990 levels by 2050⁴. As a result of improved understanding and climate modelling, however, the most up-to-date science suggests that it is very likely that a reduction of 80 to 90 per cent below 1990 levels may be necessary⁵. This suggests that climate mitigation and adaptation strategies need to be flexible, in case the rate of annual emissions reduction needs to be increased in the future.

Climate change and the UK

The highest recorded temperature in the UK was 38.5°C (101.3°F) in 2003. Climate scientists predict that such extreme temperatures could become the norm during the summer by 2050, with peaks in excess of 40°C.

The general trends predicted for the UK are drier, warmer summers; milder, wetter winters; and an increase in both the number and extent of extreme events such as floods, heatwaves, droughts and storms. For example, by the middle of the century it is predicted that severe droughts like the one experienced in 1995 may occur in one year in three. The impacts and costs of such changes in weather patterns will be felt across the whole of society.

The implications for human health and the NHS

The NHS faces a number of challenges, for example, an ageing population and increasing consumer pressure. The impacts of climate change will be a significant additional pressure. The NHS needs to gear up its capacity to deal with a potential increase in health problems in a warmer, more variable climate. It also needs to plot a course that will enable it to continue to improve the general health of the UK population. A healthier population will be more adaptable to a changing climate and more capable of dealing with climate extremes.

Health and the wider environment

Climate change mitigation and adaptation strategies are a good example of taking a more holistic view of health and well-being. Procuring hospital food from local producers, for example, not only reduces the carbon emissions and costs associated with air and road freight but also contributes to community well-being and cohesion (by boosting the local economy).

The impact of climate change on human health

The World Health Organisation (WHO) recently estimated that the global burden of disease due to climate change in terms of deaths and disability adjusted life years (DALYs). They calculated that around 150,000 deaths and 5.5 million DALYs were being lost per year⁶. However, the WHO is updating its estimates and suggesting that both figures could double in the next 25 years. These figures could be underestimates, however, due to difficulties in predicting additional deaths from extreme events, such as heatwaves, and social responses to climate change like migration, linked to changes in the range of insect-carried diseases like malaria, yellow and dengue fever. Above all,

this emphasises the need for building the capacity to adapt into a country's health service.

In 2003, the major heatwave in Europe caused more than 35,000 premature deaths, including 14,000 in France alone⁷. A French ministry of health report on the response of the public health system found a "lack of anticipation, organisation and co-ordination". In response, Health Minister Jean-François Mattei announced \$748 million in extra funding for hospital emergency services.

In the UK an additional 2,000 heat-related deaths a year by 2050 are predicted, and this may be a conservative estimate. Data on recent trends that show little change in heat-related death is a poor indicator. Statistics suffer from uncertainty in death certification and changes in public health trends over this time. Increases in heart disease, obesity and other chronic diseases over the period now mean that a higher proportion of the population will be susceptible to heat-related deaths. The latest UK estimates suggest that a severe heatwave, with a 1 in 40 chance of occurring in the imminent future could cause around 3000 immediate deaths and 6,350 heat-related deaths.

Other likely health impacts of climate change in the UK can be summarised as follows:

Food poisoning: Cases of food poisoning are likely to increase significantly, by perhaps 10,000 cases per year. With the cost of treatment and to the economy estimated to be around £79⁸ to £220⁹ per case, the additional cost to the economy could reach up to £2 million annually.

Insect-borne disease: While malaria outbreaks in the UK are likely to be rare, we face a range of other insect-related problems. For example, an increase in flies which then spread diarrhoeal diseases – the so-called 'buffet factor' and an increase in fleas which thrive in warm conditions.

Respiratory disease: Unrelated to climate change, the effects of general air pollutants on health could decline if current trends continue, but under global warming the damaging effects of surface ozone during the summer are likely to increase. The chemical reactions producing ozone from air pollution are temperature dependent, as are natural sources of ozone (ie from plants¹⁰). The impact of such ozone increases could result in a 15 - 53 per cent increase in deaths and hospital admissions from respiratory diseases related to air pollution each year¹¹.

Cancer and cataracts: Cases of skin cancer are likely to increase by perhaps 5,000 cases per year and cataracts by 2,000 cases per year in the UK by 2050¹².

Accident and trauma: As well as injuries and infectious diseases, serious flooding can result in increased anxiety and depression linked to physical and economic insecurity, especially in the elderly. Those whose homes were flooded in Lewes (East Sussex) in 2000 experienced a four-fold increase in psychological distress compared to those whose homes were not affected¹³. Stress of this nature is associated with increased risk of hypertension, heart diseases and diabetes¹⁴.

Water and sanitation: Flood waters may also create a health hazard from chemical or sewage pollution if industrial, waste-storage and treatment plants are inundated. Drinking water supplies will be affected by increased rainfall (over shorter periods), which lead to increased numbers of bacteria in surface water, increased water temperature leading in an increase in algal blooms in reservoirs and a decrease in the efficiency of chemical coagulation – a major method of removal of microbes in drinking water¹⁵.

Mould: Milder, more humid winters will lead to more mould growth in housing - already a major cause of respiratory allergies.

Although there may be some positive effects of a warmer climate on health (cold-related deaths, for example, are likely to decline), these benefits are likely to be outweighed by the negative health effects.

Current NHS adaptation strategies for climate change-related events

The *Choosing Health* white paper¹⁶ requires the NHS to act as a good corporate citizen on a range of fronts. As part of this, work is being encouraged at regional and local levels to mitigate and adapt to the projected impacts of climate change.

The key areas being addressed are adapting health and social care infrastructure to be more resilient to the effects of heat, gales and floods; development of local heatwave, gale and flood plans for coping with disasters; and increasing awareness of how people can adapt to changes in climate.

The DH launched its National Heatwave Plan in 2004. This instituted a 'heat-health watch' system for the whole of England from the beginning of June to mid-September each year, with four levels of response and appropriate advice.

International, UK Government and DH climate change targets

The UK's climate change policy is driven by international and national targets:

- an international legally-binding target set in the Kyoto Protocol, which requires a 12.5 per cent reduction in greenhouse gas emissions below 1990 levels over the period 2008 to 2012
- a more ambitious national target set in the 2003 energy white paper, which committed the UK to reducing CO₂ emissions to 20 per cent below 1990 levels by 2010 and 60 per cent below 1990 baseline levels by 2050.

These are likely to become more demanding because of emerging scientific knowledge suggesting that emissions need to be capped at a far lower level than previously thought.

The targets are reinforced by the Draft Climate Change Bill.

Department of Health targets

Energy-use levels are high in NHS healthcare facilities, costing around £400 million annually and resulting in a net emission of around a million tonnes of carbon¹⁷. Based on the Government's target of a 60 per cent reduction in emissions by 2050, the NHS will have to reduce its net emissions by at least 600,000 tonnes of CO₂.

The NHS is currently subject to mandatory climate change-related targets. These were set by the DH in 2001, and are specifically related to energy consumption in buildings.

By 2010 the NHS in England will be called upon to cut primary energy consumption by 15 per cent against year 2000 levels or carbon emissions by 0.15 million tonnes, and there are also specific energy-efficiency standards for all NHS buildings¹⁸. According to one estimate¹⁹, the potential energy savings could save the NHS in England alone around £50 million.

Initially developed for NHS England, these targets have also been adopted by the Welsh Assembly Government in relation to the Welsh NHS. The NHS in Scotland, meanwhile, is committed to a 2 per cent reduction in energy consumption per year²⁰.

A key weakness of the current targets is that they are based on large energy-intensive hospitals that are in constant use. Not only do they fail to reflect best practice performance for these facilities, but they are also applied to clinics, health centres and GP practices for which they are not appropriate. Smaller-scale healthcare facilities should have their own targets tailored to their size, together with their own plans for reducing energy consumption through behavioural change, greener travel and recycling.

According to the Carbon Trust, on average, offices waste £6,000 each year by leaving equipment on over weekends and bank holidays. An average small- or medium-sized firm spends nearly £5,000 a year on energy, of which about £900 may be unnecessary expenditure. Heating accounts for around 60 per cent of this. Just by reducing the temperature by 1 degree can decrease an energy bill by 10 per cent.

Both the NHS in England and Wales²¹ are struggling to meet their energy-reduction targets. The most recently published document on NHS energy performance in England²² indicates that the 15 per cent emissions-reduction target is unlikely to be met. While energy is being used more efficiently within the NHS, with over 70 per cent of NHS trusts meeting the mandatory target of 55-65 GJ/100m³, absolute energy consumption (and therefore emissions) is still rising.

In England consumption has actually increased by over 8 per cent since 1999-2000²³. Although net energy consumption²⁴ across the Welsh NHS fell by 5 per cent between 1999-2000 and 2004-05, primary energy consumption increased by 0.6 per cent²⁵.

If the NHS in England and Wales is to meet energy-consumption targets, year-on-year reductions in energy consumption will need to be between 6 and 8 per cent²⁶.

Meanwhile, Scotland has made good progress. Over the 19-year period to 2004-05, NHS Scotland has reduced energy consumption by around 36 per cent and reduced carbon dioxide emissions by nearly 39 per cent.

The business case for reducing energy consumption

Quite apart from environmental considerations, there is a clear business case for improving energy efficiency and for reducing total consumption in the NHS.

It is becoming more difficult to anticipate energy costs as prices become more volatile, exemplified by increases of 107 and 130 per cent respectively in electricity and gas prices between January 2004 and September 2005.

While energy consumption has increased overall, a number of NHS organisations have achieved improvements as explored in the next part of this report. The impact of energy use on climate change can be reduced significantly by changing energy systems, through on-site renewable schemes, procurement of green electricity and decentralised generation (ie using combined heat and power plants).

Renewable technologies often have high capital costs compared to cost savings, so payback times are much longer. As a result, many NHS renewables schemes cannot be financed without the support of an external grant. At the beginning of 2007, however, the DH set aside a £100 million capital fund for this purpose.

Rising to the challenge

At the national level the NHS has developed a range of strategies that aim to promote sustainable development and better environmental practice. Each regional government office now has a sustainability strategy. A challenge for the new strategic health authorities will be to take on this agenda.

The following section of this report examines specific challenges presented by climate change in six key areas - energy, planning and building, procurement, transport and travel, waste management and employment policy. It highlights examples of innovation and achievement and provides pointers for future mitigation and adaptation strategies across the NHS.

East Midlands Strategic Health Authority – action on climate change across the region

The SHA has two representatives on the East Midlands Regional Assembly. The Assembly and SHA are encouraging all NHS organisations within the region to support the national Nottingham Declaration on climate change. This has 100 per cent sign up by local authorities in the area.

Energy initiatives

Carbon management in the NHS should be relatively straightforward. Fuel bills for electricity, gas and liquid fuels for transport can be easily equated with CO₂ emissions. Measuring the performance of various NHS facilities in reducing their carbon emissions will be a particularly useful tool for gauging their success in climate change mitigation.

The Scottish experience

The energy savings achieved in Scotland have largely been secured by improvements in energy efficiency and evolving energy systems.

Using funds from the Central Energy Efficiency Fund (CEEF), the Queen Margaret Hospital in Dunfermline installed variable speed drives to Heating, Ventilation and Air Conditioning Plant. The savings resulted in a payback of the capital cost in less than six months. Lifetime savings of carbon are expected to be in excess of 1,272 tonnes – equivalent to taking approximately 500 cars off the road.

NHS Greater Glasgow and Clyde also benefited from the CEEF. They have a range of energy-saving measures on various hospital sites. The estimated carbon savings over the lifetime of the equipment installed is around 35,000 tones.

Energy consumption and behaviour change

People do not necessarily make the connection between energy costs and their own individual actions. So a particular challenge when it comes to energy consumption is promoting positive behaviour change among staff. 10 per cent of emissions in buildings could be reduced simply by changing staff attitudes to energy conservation²⁷. Staff should be encouraged to switch off unused appliances at the end of each day, in addition to carrying out basic energy audits on a regular basis. Given that the NHS is one of the largest employers in the world, there is considerable scope for changes in staff behaviour to influence energy consumption behaviours in wider society. One way to achieve this is by covering sustainability issues and the NHS climate change targets in management training and staff inductions.

Humber Mental Health Teaching NHS Trust – energy awareness campaign

'Save Energy – Save the Environment' is a key element of the trust's wider environmental strategy and has been part funded by the Carbon Trust. The campaign is communicated to staff through the trust's intranet pages go4green, plus other channels like the staff newsletter and the training of 50 local energy representatives. It aims to reduce energy costs by £50,000 per year (based on 05/06 costs) through good housekeeping, which includes:

- turning off unwanted lights, PCs and equipment
- turning down radiators and heating
- ensuring all doors and windows are closed properly
- turning off water taps after use and reporting any drips.

Partnerships with the Carbon Trust

The Carbon Trust²⁸ is a key organisation operating in the arena of energy management. In 2006 the trust launched the pilot phase of its NHS Carbon Management Scheme (NHSCM).

The NHSCM provides NHS organisations with support and guidance to raise awareness of and commitment to energy issues. In the six months in which the pilot ran, the total CO₂ savings identified for the ten healthcare institutions involved was around 64,000 tonnes per year – equivalent to the emissions produced from driving an average family car over 8,500 times around the equator. The cost saving associated with this was around £7 million.

Another newly-launched initiative is the Carbon Trust's NHS network, which gives energy and estate managers the opportunity to share energy-efficiency best practices and ideas with colleagues across NHS organisations.

Guy's and St Thomas's NHS Foundation Trust

Guy's and St Thomas' NHS Foundation Trust has two large central London sites, with an annual energy bill of around £10 million and annual emissions of more than 67,000 tonnes of carbon dioxide. With the support of the Carbon Trust, Guy's and St Thomas' aims to:

- raise staff awareness to make significant energy, cost and CO₂ savings
- reduce emissions by as much as a fifth.

The measures could help save the hospital £2.95 million per year in energy costs and reduce carbon dioxide emissions by more than 16,000 tonnes.

Energy-saving recommendations include fitting boiler controls, upgrading the hospitals' heating and ventilation systems and installing a Combined Heat and Power (CHP) unit.

Decentralised energy systems, renewables and combined heat and power plants

The way in which energy supplied to homes and offices is produced and distributed is a significant barrier to reducing CO₂ emissions.

Centralised electricity generation is inefficient, with around two-thirds of the original energy from the fuel source²⁹ expelled as heat. Further losses are incurred in the distribution of electricity.

Co-generation using CHP, although typically using natural gas rather than renewable sources, is one path to improving the efficiency of energy systems. CHP units generate heat and power simultaneously in a single process. If waste heat is utilised and distribution losses are minimised in a CHP decentralised energy system, total efficiency can be increased to 90 per cent. However, some trusts have installed CHP but have experienced difficulty in making them economic because of fluctuations in the price of natural gas. The NHS will want to see whether CHP systems could be the norm in all new large-scale NHS facilities.

There is potential for smaller-scale PCT sites too. A single micro CHP, a technology still in development in its commercial form, could save between 5 and 10 tonnes of CO₂ per year on a small-scale NHS primary care site³⁰.

Decentralised renewable energy systems reduce transmission losses as well as providing a cleaner source of energy. A decentralised renewable energy system could include photo-voltaic panels, small hydro schemes, on-site wind power and localised geothermal production³¹.

Successful CHP and decentralised renewables schemes

Dalkia Utilities Services developed a new energy centre at the Hartlepool Hospital as part of a PFI contract³² with North Tees and Hartlepool NHS Trust. This included the installation, operation and management of a medium-scale CHP (1.4MWe³³). The surplus electricity generated will be exported to other trust properties. Since 'good quality' CHP units are exempt from the Climate Change Levy (0.43p per kWh), all sites using the CHP power will benefit from an exemption, and the trust estimates that it will generate savings of around £130,000 per annum.

Powys Local Health Board secured funding for 485 photo-voltaic solar panels at Bronllys Hospital. This installation will provide 45,000 kWh of electricity per annum (6 per cent of the hospital's needs), with a likely saving of around £4,000 each year³⁴.

Antrim Hospital installed a 660kW wind turbine in 2005. The total project cost was around £495,000, of which £140,000 has been clawed back in savings made during the first two years of operation. CO₂ emissions have been reduced by just over 1,000 tonnes – the equivalent of taking around 400 cars off the road each year. Current savings suggest a payback period of around 6.9 years, with the potential of reducing this to 4.6 years through the sale of Renewable Obligation Certificates.

Water management

In 2001 the NHS in England and Wales consumed an estimated 49.8 billion litres of water and generated approximately 42.6 billion litres of sewage.

According to the Building Research Establishment (BRE), the energy-intensive nature of water supply and treatment means that this can be equated to around 11,500 tonnes of carbon dioxide per year.

The amount of energy needed for water treatment is likely to increase as standards increase and as distribution and treatment systems are modernised and extended. The NHS therefore has a responsibility to minimise water wastage.

Grey water³⁵ recycling systems can be part of the design solution, for example, re-using water from sinks and washing machines. According to one study, these schemes can yield water savings of approximately one third³⁶.

Sustainable planning and building

A lot of money has been invested in new health buildings and the NHS is in a good position to make substantial long-term reductions through more sustainable design. However, this requires commissioning by the client.

Any substantial building in the NHS is governed by the European Union's Energy Performance of Buildings Directive³⁷, which sets mandatory energy/carbon efficiency targets for all member states up to March 2010³⁸.

The influence of existing policy initiatives

NHS Estates' guidance on the built environment includes a software package called the NHS Environmental Assessment Tool (NEAT). NEAT estimates the negative impact of buildings on the environment through day-to-day operations. It can be applied to new developments, refurbishments and existing buildings to establish a rating of buildings performance. All new buildings are required to achieve a NEAT rating of excellent and all refurbishments a rating of very good.

A recently published Health Technical Memorandum³⁹ provides minimum energy-performance standards for all NHS buildings and service contracts, and emphasises that healthcare organisations should have an energy and carbon management policy endorsed by the chief executive and supported by an energy champion who sits on the board⁴⁰.

Future proofing building design

The NHS aims to ensure that buildings remain fit for purpose over time. Global warming has added further complexity to the challenge of sustainable construction. While buildings should have minimal impact on the natural environment, it is also necessary to ensure that they are designed to withstand changes to the environment with the onset of climate change:

- rainfall variability
- subsidence
- wind damage
- warmer external temperatures and the increased the demand for air conditioning.

The value of well-designed spaces

One way in which planners can make hospital buildings better places is to pay close attention to where they are sited, in terms both of the pleasantness of the surroundings and accessibility to other local community facilities.

Good building design can improve patient recovery and workforce productivity. Workforce productivity gains of 6 to 16 per cent have been identified in buildings with an energy-efficient design⁴¹. Improvements in the quality of work and a reduction in absenteeism have also been reported⁴².

The NHS Estates Consortium has looked at future design of hospitals and other healthcare buildings and has made recommendations for how they can be greener. It suggests that a saving in energy costs of at least 25 per cent could be made simply by designing things differently. The report *Claiming the Health Dividend*⁴³ outlines an eight-point framework for the design and construction of sustainable buildings that should be considered by architects, building contractors and facilities managers (see box, below).

Examples of good practice

The new Gateway Surgical Centre, part of the Newham University Hospital NHS Trust, won the Health Service Journal's Good Corporate Citizenship Award in 2006. The centre used sustainable building design, and the new development was integrated with five local bus routes. The trust has managed to reduce its carbon emissions while creating a better healing environment, with a 98 per cent patient satisfaction rate.

The Plowright Surgery building in Swaffham uses only a third of the energy compared to a target set by the DH for new build. The building has been specifically designed to maximise passive heating and cooling, and construction materials were selected for their low embodied energy and environmentally-benign properties⁴⁴.

Framework for the design and construction of sustainable buildings

- **location** – the re-use of already developed land or brownfield sites is preferred to claiming undeveloped land from the natural environment
- **the relationship between a building and its site** – natural features of the site can be used to provide, for example, storm water management
- **the orientation of a building** – using natural sunlight and shade can reduce the need for mechanical heating and cooling
- **resource efficiency** – using land, building materials and design to save money and reduce energy and water consumption
- **accessibility and mobility** – the location and design should encourage active transport, and should be linked into green travel plans
- **waste minimisation** – at every stage of the design, build and operation phase of the development, the creation of waste should be minimised
- **community involvement** – working with the local community and supporting the local economy by using local supplies and labour
- **whole-life costing** – social, financial and environmental costs and benefits should be taken into account.

Improving the energy efficiency of existing buildings

Upgrading existing buildings with energy-saving devices could have a significant impact on energy consumption and subsequently on carbon emissions. Improvements worth undertaking include changes to the building fabric (such as insulation) and additions that increase operational efficiency (such as motion-sensor lighting and building management systems).

Upgrades like these have the potential to reduce emissions from NHS buildings by 8 to 10 per cent, resulting in significant cost savings - as demonstrated by the NHS Scotland examples on p10.

The evidence suggests that where possible energy efficient refurbishments should be encouraged over demolition and re-build – as being much more carbon efficient.

The NHS Good Corporate Citizenship self-assessment model

Developed by the Sustainable Development Commission, the self-assessment model was launched in February 2006. 151 NHS bodies have already registered to use the model and it has also captured the attention of other sectors, with 134 non-NHS bodies also registered.

Green procurement

The NHS's demand for food, goods and services makes up around 10 per cent of some UK regional economies.

Procurement is an area where the NHS can flex its financial muscle both to boost the local economy and to curb the carbon emissions created by transporting

supplies over long distances. The purchasing power of the NHS is vast, estimated at around £17 billion a year, and the Government has declared that it wants the NHS to be a leader in sustainable procurement across EU member states by 2009⁴⁵.

The DH's consultation paper *Tackling Health Inequalities* points to the contribution that NHS procurement can make through 'its investment in staff and capital, the purchase of services and the development and regeneration of local economies'.

Although the NHS can - to a certain extent - choose to buy from local or national suppliers, their choices are often limited. They need to keep within the framework set by European laws designed to safeguard fair competition, and are often committed to large contracts brokered by the NHS Purchasing and Supply Agency (NHS PASA) to achieve economies of scale and ensure consistent quality of supplies⁴⁶.

Local food for local people

The NHS is the largest purchaser of food in the UK, with enormous scope to embrace a more sustainable procurement model through supply contracts with local producers.

The food industry has a formidable carbon footprint (the amount of carbon emitted over the lifecycle of a product from production, transport, disposal). 95 per cent of the fruit and half of the vegetables in the UK are imported. The amount of food being flown into the UK doubled in the 1990s and is predicted to rise further each year⁴⁷. In addition to the greenhouse gases released from the transport of food, there is also the impact of large-scale, intensive agriculture to consider.

By developing local food procurement the NHS can cut emissions, support the local economy and help protect the NHS from potential price shocks, should the price of transport suddenly increase.

By supporting the livelihoods of local food producers, NHS food procurement can help build the economic stability and community cohesion that so often underpin general health and well-being, as every £10 spent on local food can generate £25 for the local economy.

A new approach to food in Cornwall

The Cornwall Food Programme, run by the Royal Cornwall Hospitals Trust in partnership with the Soil Association, is a good example of what sustainable food procurement can achieve.

Since 2001 the menus in three Cornish hospitals have been transformed by serving increasing amounts of fresh, locally produced and organic food to patients, visitors and staff. Over 80 per cent of the trust's food budget is now spent through Cornish companies, and over 40 per cent goes on Cornish produce. The annual 'food miles' travelled by delivery vehicles and the carbon emissions associated with them have been cut by two-thirds⁴⁸.

Transport, travel and physical activity

Road transport accounted for 25 per cent of all UK carbon dioxide emissions in 2004, up from 22 per cent in 1990. It is the only sector where emissions are expected to be higher in 2020 than in 1990. Additionally, the inexorable growth of car travel is contributing to high levels of air pollution and respiratory diseases such as asthma.

An enlightened approach to transport and travel has the potential to make a significant contribution, both to reducing the carbon footprint of the NHS and to promoting better health. By operating transport more efficiently and using low-carbon vehicles and fuels, trusts can reduce emissions, congestion and pollution. By developing

green travel plans that enable staff, patients and visitors to cut their car use, the NHS can give a significant boost to healthy physical activity.

The national NHS policy directive encouraging treatment closer to home may result in less journeys into hospital and shorter journeys in the community.

Physical activity and health

The cost to society of inactivity is estimated to be around £8.3 billion per year - £5.4 billion from sickness absence, £1 billion from premature mortality and £1.7 billion in direct health care costs to the NHS⁴⁹. Yet a 10 per cent increase in adult physical activity could save 6,000 lives and £500 million each year⁵⁰.

The DH report *Choosing Health*⁵¹ offers guidance to the NHS and local authorities on developing initiatives to encourage increased physical activity through walking and cycling. Among the ideas it commends are:

- promoting the National Cycle Network, which connects well with a number of NHS health facilities
- projects that encourage and equip children to walk or cycle to school in reasonable safety - one in three children would prefer to bike to school but only 2 per cent currently do
- extending rights of way as part of local transport plans
- following the lead of sustainable travel towns such as Darlington, where significant funding is invested in promoting active and public transport
- motivating people to become more active through the use of pedometers
- appointing regional physical activity co-ordinators
- forging links with schemes such as the British Heart Foundation's 'walking the way to health'.

Good practice and challenges

The sustainable transport charity Sustrans surveyed work in progress across the NHS in England⁵², and found a number of examples of high-quality, integrated travel planning. Most of these were focused on staff travel but some of the best also involved improving access for patients and visitors, and more efficient patient transport.

NHS staff have concerns about being able to get to work at unsocial hours so initiatives need to be co-ordinated with public transport providers.

Good practice in travel planning: Addenbrookes Hospital

Through a number of initiatives, car use at Addenbrookes Hospital has fallen from 60 per cent in 1999 to 38 per cent in 2006, and 8 per cent of this is car share.

Improved bus services have doubled bus commuting by staff (25 per cent), while 1,300 cycle parking spaces and improved cycle facilities have encouraged 25 per cent of staff to commute by bike. Additionally, a park-and-ride scheme commissioned and managed by the NHS aims to reduce car traffic in the vicinity of the hospital.

Overcoming obstacles to health improvement through transport initiatives

In order to encourage more sustainable travel, NHS organisations need to develop partnerships with local transport authorities. This will help to ensure that new and existing sites develop transport links that are tailored to the needs of the local population using NHS sites.

East of England Ambulance Service and Norfolk County Council

The two organisations looked at how much common activity existed between health and social services transport requirements. By centralising the booking and planning systems, they were able to see available spare seats on already-scheduled transport.

This was initially done to get the best use of public expenditure, and the Norfolk integrated transport partnership predicts savings for 2007/2008 of £100,000. The added benefit is less vehicle journeys so fuel usage and emissions are reduced.

This form of centralised planning has a hugely positive impact on the environment, with the information on routes and journey numbers being used to review both fleet size and the types of vehicles. The use of smaller vehicles is good as more alternative fuelled vehicles are available in this sector, with one vehicle being used with multiple occupants instead of a number of cars with one passenger.

Waste management

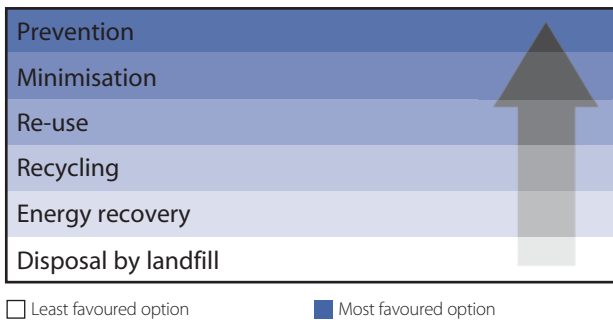
Once, the sign of a good waste service was 'out of sight, out of mind'. Now it is recognised that this is unsustainable. By reducing waste, the NHS can help reduce energy consumption, save money and minimise the health hazards associated with landfill and incineration.

The large majority of NHS hospital waste goes to landfill⁵³, although there is currently a drive to increase the number of incinerators in the UK - especially Energy from Waste plants. While both landfill and incineration produce greenhouse gas emissions, incineration is often thought to be more

favourable than landfill because it avoids the production of methane, a gas that is 23 times as damaging as carbon dioxide in terms of the greenhouse effect.

Incineration does, however, release carbon dioxide and also emits other potentially toxic particulates and gas. The resulting ash is highly toxic and is subject to energy-intensive and costly hazardous-waste procedures.

Given all these problems, the best approach is to reduce the waste produced, re-use, and recycle or compost as much as possible. Only when this cannot be achieved should energy recovery from waste and disposal (as a last resort) come into play. This waste hierarchy is the basis of government waste strategies since the mid-1990s.



Recycling

An increase in the recycling of waste would have a considerable impact on the carbon footprint of the NHS.

In 2001, just 1.8 per cent of domestic waste (paper, bottles, cans and kitchen waste) was recycled by the NHS in England and Wales. Four years on a report published by London Remade suggested that the rate had not changed⁵⁴.

At the point of generation waste has to be transported and disposed of, releasing greenhouse

gases. However, the manufacture of goods from recycled energy generally requires considerably less energy than virgin materials. As a result, recycling is effective at reducing greenhouse gas emissions.

Even if a recycling target of only 40 to 60 per cent were to be achieved by the NHS, the emissions savings delivered would be between 16,500 and 23,000 tonnes of CO₂ per year.

While different methods of waste disposal have strong implications for the extent of greenhouse gas emissions, the costs associated with transportation of waste are a further incentive to reduce the amount produced in the first place.

Cutting carbon emissions through recycling or incineration

nef calculates that recycling all the paper, cardboard, magazines and newspapers produced by the NHS in England and Wales could save up to 42,000 tonnes of CO₂.

This is equivalent to the savings made by replacing over half a million 100W incandescent light bulbs with 20W energy-saving bulbs, or taking around 17,000 cars off the road.

Current policy and obstacles to progress

There is a plethora of environmental legislation concerning waste management. The majority of legislation is concerned with the toxic nature of waste, and does not consider its climate change impact.

A key policy action for NHS will be to include a life-cycle analysis where all stages of the waste cycle are considered from procurement, transport

and final disposal in all waste management strategies, to ensure that waste is being managed in the most sustainable way, with minimal carbon emissions. In addition, a life-cycle analysis should be included in purchasing and supplies decisions to reduce the amount of waste produced.

The NHS Environmental Assessment Tool (NEAT) includes a section on waste to help trusts identify environmental impacts and develop an appropriate plan of action.

The report *Claiming the Health Dividend*⁵⁵ identifies a number of problems associated with enforcing a waste strategy. One challenge relates to proper waste segregation, particularly in hospitals. Domestic waste is too often deposited in clinical waste bags to be disposed of at a higher cost via a more energy-intensive process.

Clinical waste disposal is around six-and-a-half times as expensive as domestic waste disposal. According to one estimate⁵⁶, putting a paper towel in a clinical waste bag costs £1 compared to 15p for disposal in a domestic bin.

Innovative waste initiatives

A waste audit by Whipps Cross University Hospital NHS Trust revealed that 70 per cent of waste in clinical waste bags was actually domestic waste. The facilities-led Trust Environmental Action Group sought the help of London Remade, a not-for-profit organisation, with staff awareness raising and training. On one hospital ward, staff now use small yellow bags at the bedside, so only necessary clinical waste is disposed of. Repeating this in all clinical areas could save the trust £100,000.

The average printer cartridge is responsible for around 2.5 kg of CO₂e in its manufacture. Scaled

up to reflect total printer cartridges used in NHS England, this is approximately equal to 30,000 tonnes of CO₂e. Conscious of this environmental impact, the Hertfordshire Partnership teamed up with Environmental Business Products (EBP) to recycle all the empty printer cartridges from its offices and units.

Barnsley Hospital Foundation NHS Trust has saved around £29,000 per year by recycling or re-using paper, furniture and clinical waste. The savings made covered the salary of a recycling officer who has since being appointed to help identify further savings.

According to the Kings Fund, around 17 million hospital meals are disposed of each year, equivalent to £18 million in food costs⁵⁷. Eastbourne District General Hospital reduced the amount of food waste from 19 per cent to 4 per cent by simply by experimenting with the catering system, for example changing ordering times or asking patients what they like to eat.

Employment policy

The NHS is the largest public sector organisation in Europe, spending over £69 billion on delivering its services in 2004-05⁵⁸. The colossal scope of its operations means that it employs over 1.3 million people⁵⁹.

Providing employment on this scale represents a significant weapon in the armoury the NHS can draw upon to help combat climate change.

- NHS organisations are major employers in their communities. The local employment they offer can contribute enormously to the surrounding economy and to community cohesion and well-being.
- There is huge potential within the employment relationship to influence behaviour in the wider community. Through training and personal development, NHS staff can be encouraged to change their behaviour around energy conservation and recycling and to help change attitudes among those around them.

Working in partnership and using local area agreements

The closer the examination of the fine points of climate change mitigation and adaptation in different areas of NHS operations, the clearer it becomes that there are significant overlaps that demand an overarching strategy.

Local government and NHS organisations will need to work together as leaders within local communities to tackle the issue. Local area agreements will be a useful tool to make this happen and the Local Government Bill will make local area agreements a much more significant part of the local planning machinery, and PCTs will have a statutory duty to participate.

The health and scrutiny powers extended to local authorities under the Health and Social Care Act 2001 may also help bring health and environmental planning closer together. The legislation gives a committee of councillors the authority to oversee the improvement of health in the widest sense, building on the power of local authorities to promote social, environmental and economic well-being.

Gloucestershire Hospitals Foundation NHS Trust – a joined-up approach to decarbonising the NHS

Gloucestershire Hospitals Foundation NHS Trust has developed a corporate citizenship committee. The leaders from all six priority areas in the good corporate citizenship model are represented, from procurement and transport to facilities and employment, alongside two foundation trust governors representing the public and staff.

This committee has become a powerful means of networking and identifying good practice. It also helps the trust build relationships with other concerned organisations, such as local strategic partnerships and Jobcentre Plus.

The trust now has a pilot park-and-ride scheme for staff and patients, and there are plans for a more extensive park-and-ride and a shuttle bus service between sites. The A&E department at the Gloucestershire Royal Hospital has been designed with energy efficiency in mind, with deflectors at the windows to ensure rooms do not overheat in the summer and a grey water recycling scheme. The trust now sources around 30 per cent of food locally, and wants to reach a target of around 35 per cent in the next two years.

Ten questions to ask

There are ten key questions that NHS boards can ask that will make a difference.

1 **Leadership:** Has your board discussed the climate change agenda?

Public services tend to be most successful in developing progressive approaches to climate change mitigation when there is strong leadership at the top of the organisation.

2 **Strategy:** Does your organisation and your local authority have a climate change strategy, an action plan and the capacity to adapt?

Global warming will lead to social and economic upheaval as well as greater climatic volatility. To respond quickly and effectively to a more unpredictable world the NHS will need the capacity to adapt. There is a need to shift the emphasis of climate change initiatives from quick wins to a longer-term vision. One way forward is to have a long-term climate change strategy and action plan, which covers mitigation and health improvement and has separate targets for different areas of operation such as procurement, administration and maintenance.

3 **Targets:** Is your organisation meeting the mandatory targets for reduction in energy consumption and increasing the energy efficiency of buildings?

NHS organisations are required to deliver a minimum 60 per cent reduction in greenhouse gas emissions by 2050. They are also bound by targets for increasing the energy efficiency of buildings. The best way to meet such targets is for trusts to assess carefully where they currently stand, allocate resources accordingly and set their own year-on-year reduction goals.

4 **Partnership:** Are you working collaboratively on tackling climate change with local organisations?

Local authorities take the lead in the provision of public transport, for example, and there is plenty to be gained from integrated planning in this and other spheres. Local strategic partnerships are an opportunity to bring together community leaders.

5 **Energy:** How much did your organisation spend on energy last year, and what proportion of 'green' electricity was procured?

Addressing climate change is about more than just reducing emissions. It is also about placing a higher value on energy and reducing overall consumption. An energy audit, assessing the extent to which computers and lights are left on unnecessarily, is a good place to start.

6 **Buildings:** Have you used the NHS Environmental Assessment Tool (NEAT) to assess the impact of your trust's estate on the environment?

The majority of NHS carbon emissions come from buildings but a sustained and extensive capital investment programme offers the opportunity for many trusts to make the built environment more energy efficient. All new buildings are required to achieve a NEAT rating of excellent and all refurbishments a rating of very good.

7 **Procurement:** How many of the goods and services you purchase are sourced locally?

Has your organisation assessed the financial and environmental benefits it could secure if it used local suppliers more? Local procurement plans that are ambitious but appropriate for your location are a step towards reducing carbon emissions.

8 **Transport:** Have you reviewed your green transport plan?

Transport is an area where action to curb emissions for the sake of the environment can also have significant health benefits. Reducing car use cuts air pollution and gets more people cycling, walking and enjoying the open air.

9 **Waste:** Can your waste plan do more?

A waste plan and specialist staff will help your organisation to adopt a comprehensive approach to reducing, re-using and recycling as much as possible. As with energy, start with an audit to assess current recycling rates and waste segregation.

10 **Staff:** How are they involved?

The NHS employs more than 1.3 million people, with huge collective potential to cut carbon emissions through changes in behaviour at home and in the workplace. NHS unions support the green agenda so discussion with local representatives will help with engagement. Education and training programmes will encourage employees to make changes such as walking, cycling and recycling more, using energy-efficient light bulbs and switching off lights and equipment when not in use. Staff champions and building action on sustainability into performance management can be a good ways to help cultural change take root.

References

- 1 Health Protection Agency (2007) *Health Effects of Climate Change in the UK: an update of the Department of Health Report 2001/2002*
- 2 IPCC (2007) *Climate Change 2007: Impacts, Adaptation and Vulnerability*
- 3 Seventy-seven per cent of the UK's greenhouse gas emissions are CO₂
- 4 Op. Cit. UK Climate Change Programme (2006)
- 5 Meinshausen, M. (2006), *What does a 2°C target mean for greenhouse gas concentrations? A brief analysis based on multi-gas emission pathways and several climate sensitivity uncertainty estimates* (Avoiding dangerous climate change, in H.J. Schellnhuber et al. (eds.), Cambridge, Cambridge University Press, pp.265 – 280).
- 6 WHO (2002). *The world health report 2002: reducing risks and promoting health life* (WHO, Geneva)
- 7 Bulletin of the World Health Organisation 2003, 81(10)
- 8 Food Standards Agency (2001). *Strategic Plan 2001-2006*. London: FSA p9-10
- 9 Jenny Roberts (1995), 'The socio-economic costs of foodborne infection', unpublished paper to Oxford Brookes University conference Foodborne disease: consequences and prevention, St Catherine's College Oxford, April
- 10 Bell, M.L. Goldberg, R., Hogrefe, C., Kinney, P.L., Knowlton, K., Lynn, B., Rosenthal, J., Rosenweig, C. and Patz, J.A. (2007) Climate change, ambient ozone and health in 50 US cities. *Climate Change* 82:61-76
- 11 Health Protection Agency (2007) *Health Effects of Climate Change in the UK: an update of the Department of Health Report 2001/2002*
- 12 Department of Health (2001) *Health Effects of Climate Change in the UK*
- 13 Reacher, M., McKenzie, K., Lane, C., Nichols, T., Kedge, I., Iverson, A., Hepple, P., Walter, T., Laxton, C., & Simpson, J. (2004). Health impacts of flooding in Lewes: a comparison of reported gastrointestinal and other illness and mental health in flooded and non-flooded households. *Communicable Disease and Public Health*, 7, 56-63
- 14 Weisler RH, Barbee JG and Townsend MH (2006) Mental Health and Recovery in the Gulf Coast after Hurricanes Katrina and Rita *Journal of American Medical Association* 296, 585-588
- 15 Health Protection Agency (2007) *Health Effects of Climate Change in the UK: an update of the Department of Health Report 2001/2002*
- 16 Department of Health (2004) *Choosing health: making health choices easier* (HMSO)
- 17 This excludes the wider carbon footprint, which includes transport (supplies and people) and waste.
- 18 Energy-efficiency targets for all new capital development and all major redevelopments or refurbishments are 35-55 GJ/100m³/yr⁻¹, and 55-65 GJ/100m³/yr⁻¹ for all existing facilities.
- 19 C. Hall (2007), Public Service Review: Health Issue 10 - *Thursday, February 08, 2007*
- 20 NHS Scotland targets are working from a baseline of 1990 levels, whereas trusts in England and Wales are currently monitoring their progress against a 1999-2000 baseline.
- 21 Wales Audit Office (2005) *NHS Energy Management in Wales*
- 22 Ibid
- 23 Department of Health (2006) *Statistics on energy performance and carbon and CO₂ emissions*.
- 24 Includes energy generated on site
- 25 Ibid
- 26 The latest energy-efficiency figures from NHS estates in England and Wales suggest that buildings are beginning to use energy more efficiently. For example, around 70 per cent of NHS trusts were ranked within the two highest categories for energy performance. Overall, however, energy consumption is still increasing.
- 27 Greater London Authority (2007) *Action today to protect tomorrow: The Mayor's climate change action plan*.
- 28 <http://www.thecarbontrust.co.uk/carbon/nhs/>
- 29 For example coal, gas, oil or nuclear power
- 30 The Carbon Trust provides information on grants and incentives to point the health sector towards financial and practical help available to implement CHP schemes.
- 31 Ground source heat pumps
- 32 PFI is one of a range of government policies designed to increase private-sector involvement in the provision of public services. Risks are transferred to the private sector if they are more able to deal with those risks. In the case where the public service is more able to deal with risks, such as a service where demand is not high, the service must remain within the public sector.
- 33 mega watt equivalent
- 34 Wales Audit Office Survey of NHS trusts in Wales.
- 35 Grey water recycling refers to water used in sinks, baths and showers. Grey water then is reused in toilets, washing machine and outside taps.

- 36 Dixon, A., Butler, D. and Fewkes, A. (1999). Water saving potential of domestic water reuse systems using grey water and rain water in combination. *Water Science and Technology* 39, 2532.
- 37 2002/91/EC - the requirements of this directive are overseen and executed in England under Part L of non-domestic building regulations.
- 38 Buildings with a total useful floor area over 1,000 m² are subject to minimum energy-performance requirements. This includes new-build and refurbished NHS healthcare facilities. Buildings over 1,000m² that provide a public service are required to display an energy certificate, in a similar format to those used in the labelling of white goods.
- 39 HTM 07-02: EnCO₂de – ‘making energy work in healthcare’
- 40 The memorandum’s other recommendations include a five-step approach to energy management developed by the Carbon Trust; provision of a project-design checklist that should be used during the design, construction and hand-over phase of all capital projects; and a site-wide energy plan identifying how the energy needs of the site are to be met.
- 41 Rocky Mountain Institute (2000) *Green Development: Integrating ecology and real estate*
- 42 Ibid.
- 43 King’s Fund (2002) *Claiming the health dividend* (edited by A. Coote)
- 44 http://www.shine-network.org.uk/?p=case_studies&aid=10 (accessed April, 2007)
- 45 Securing the Future 2005
- 46 NHS PASA is keen to promote ‘whole-life’ costing in the evaluation of tenders. The idea of this is that trusts should take into account not only the price of a product, but also the long-term running and maintenance costs, as well as the costs incurred through transport, consumption of energy and generation of waste. NHS PASA’s sustainable procurement strategy, launched in 2006, suggests a range of tools and ideas to help health-service managers. A survey in 2002 showed, however, that the majority of NHS buyers had not embraced this approach.
- 47 AEA Technology Environment (2005) *The Validity of Food Miles as an Indicator of Sustainable Development: Final Report* (Produced for the Department of Environment Food and Rural Affairs) (<http://statistics.defra.gov.uk/esg/reports/foodmiles/final.pdf> accessed April, 2007)
- 48 *A Fresh Approach to Hospital Food*, Soil Association, 2007
- 49 Op. Cit. Pretty et al. (2003)
- 50 Op. Cit. Pretty et al (2003)
- 51 Op. Cit. Department of Health (2004)
- 52 Sustrans (2005), *Safe Routes to Healthcare* (Sustrans Information Sheet FH05)
- 53 Op. Cit. King’s Fund (2002)
- 54 Best Foot Forward (2003) *Material Health: A mass balance and ecological footprint analysis of the NHS in England and Wales*; & http://www.londonremade.com/media_news_detail.asp?nid=155
- 55 Op. Cit. King’s Fund (2002)
- 56 <http://www.whippsx.nhs.uk/news/2006/11483114251304.html>
- 57 This figure increases to £144 million if food preparation waste and staff costs are also included.
- 58 Resource Budget Departmental Expenditure Limits: 2000-1 to 2007-8, HM Treasury, March 2006
- 59 Chief Executive’s Report to the NHS (2006)

Further information

To find out more about the issues covered in this report, please contact Rachel Maybank at the NHS Confederation on 020 7074 3305 or at **rachel.maybank@nhsconfed.org**

For more information about NHS Employers' work to maximise the potential within the NHS workforce to help tackle climate change, please contact Steven Weeks at NHS Employers on 020 7074 3213 or at **steven.weeks@nhsemployers.org**

More information about the Carbon Trust can be found at **www.carbontrust.co.uk**

The DH and the Health Protection Agency updated draft report of the Health Effects of Climate Change in the UK
http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsStatistics/DH_074439

The Mayor of London has launched his Climate Change Action Plan and more information can be found at **www.london.gov.uk**

The Sustainable Development Commission is the Government's independent watchdog on sustainable development. The Healthy Futures Programme is funded by the DH and more information is available at **www.sd-commission.org.uk**

Further information about UNISON's work on climate change can be found at **www.unison.org.uk/green**

Sponsor viewpoint

Arup is pleased to support this report. We congratulate the NHS Confederation on tackling this challenging and often contentious issue.

Over the last few years, society's expectations with respect to environmental sustainability have increased markedly and the NHS is rightly responding. However, there is also a duty to do this in a financially responsible way. The challenges faced by the NHS should not be under-estimated, but we believe passionately that by the intelligent application of new technologies and skills,

becoming more sustainable can be a positive force for change, productivity and profitability in the workplace.

Arup has brought expertise in business consulting, engineering and technology to the NHS for a number of years. This gives us an excellent understanding of the practical challenges that managers and staff now confront and we look forward to developing our partnership with the NHS to address these.

ARUP

Taking the temperature

As climate change increases and global warming continues to worsen, the NHS faces a dual challenge. It needs to respond to the increasing extremes of weather and the strain on public health. As one of the world's biggest and most resource-hungry public services, it needs to act to reduce the significant contribution its own carbon emissions are making to global warming.

This report examines the implications of climate change for human health and the NHS, the current targets and how NHS organisations are rising to the challenge. *Taking the temperature* concludes with ten questions which boards can ask that will make a difference.

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