



# “Saving Carbon, Improving Health”

Brighton and Sussex University Hospitals NHS Trust  
Carbon Management Plan 2011 to 2015



*(Thermal image of the Royal Sussex County Hospital)*

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## **Cover photograph**

*The cover photograph was taken with a thermal image camera and demonstrates the heat energy being emitted from buildings. The lighter areas indicate a large amount of heat energy and/or a poorly insulated building.*

*The Royal Alexandra Children's Hospital is readily identified by the darkness of its roof, which indicates a high level of insulation. However, this does not necessarily mean that the building is using low levels of energy; in fact the light area of the roof shows a lot of heat being emitted from the plant room exhausts.*

*The overall impression from the photograph has to be the amount of energy the Hospital is using as it sits glowing in contrast to the surrounding houses. Whilst one would expect a hospital to use relatively high amounts of energy, we cannot ignore our responsibility to minimise the negative impact of carbon emissions upon the environment and residents of Brighton and Sussex. It is vital we seize the opportunity to address this forthwith.*



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## Foreword from Duncan Selbie

In February 2011 the Board of Brighton and Sussex University Hospitals approved our Carbon Management Plan for the next five years which sets out how we will meet our obligation to reduce our carbon (CO<sub>2</sub>) emissions, the amount of waste we produce and our overall consumption of energy and water. Our annual carbon emissions (from utilities, water, transport, clinical and domestic waste) currently amounts to 25,737 tonnes of CO<sub>2</sub> a year which equates to an annual bill of about £4.5 million. There is definitely more we can and should be doing to reduce our carbon emissions and a great deal of good we could do with the potential financial savings this will release.

We are already taking forward a number of projects which are having a positive impact on our energy consumption, waste management and capacity to recycle and in 2010/11 our consumption of both gas and electricity was down on the previous year by 4 and 2 per cent respectively. Working with the Carbon Trust, we are committed to maintaining this momentum and by engaging all our staff, and wherever possible patients, in making the necessary changes to achieve a reduction of at least 25% in CO<sub>2</sub> emissions from our direct activities over the next five years. This needs to be everyone's responsibility and part of the hospital's DNA.

**Duncan Selbie**  
**Chief Executive**  
**Brighton and Sussex University Hospitals NHS Trust**



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## Foreword from the Carbon Trust

Cutting carbon emissions as part of the fight against climate change should be a key priority for NHS Trusts - it's all about getting your own house in order and leading by example. The UK government has identified the NHS sector as key to delivering carbon reduction across the UK in line with the Climate Change Act targets, and the NHS Carbon Management programme is designed in response to this. It assists NHS Trusts in saving money on energy and putting it to good use in patient care, whilst making a positive contribution to the environment by lowering carbon emissions.

Brighton and Sussex University Hospitals NHS Trust partnered with the Carbon Trust on this ambitious programme in 2010 in order to realise substantial carbon and cost savings. This Carbon Management Plan commits the BSUH to a target of reducing CO<sub>2</sub> by 25% by 2015 and underpins potential financial savings to the organisation of around £900,000 per year by that date.

There are those that can and those that do. NHS Trusts can contribute significantly to reducing CO<sub>2</sub> emissions. The Carbon Trust is very proud to support Brighton and Sussex University Hospitals NHS Trust in their ongoing implementation of carbon management.

Richard Rugg  
Head of Public Sector, Carbon Trust



## Executive Summary

### *Where are we now?*

Man-made carbon dioxide (CO<sub>2</sub>) and other greenhouse gas emissions (carbon emissions) are believed by the UK government and the majority of the scientific community engaged in the climate field to be a major contributory factor in the increase in global temperature seen since the Industrial Revolution.

Public sector leadership is critical to the achievement of the Government's climate change objectives, such as the long term goal to reduce CO<sub>2</sub> emissions by 80% by 2050 in the Climate Change Bill.

Our annual carbon emissions, (from utilities, water, clinical and domestic waste, and transport), currently amounts to 25,737 tonnes of CO<sub>2</sub>. Our annual bill from these emissions equates to about £4.5 million each year.

In addition, from April 2013 we will be subject to the Carbon Reduction Commitment Energy Efficiency Scheme (CRC), which is the UK's mandatory climate change and energy saving scheme. CRC is basically a tax on carbon emissions from utilities. It is expected to cost the Trust about £300k a year but will be reduced as we lower our carbon emissions.

There are 3 main reasons why BSUH should take positive steps to reduce its carbon emissions:

1. To minimise the negative impact of climate change on the environment and health.
2. To achieve financial benefits gained from reducing carbon emissions.
3. To meet our legal obligations with regard to carbon management.

### *Where do we want to be?*

The vision for our Carbon Management Plan is:

**To become a leading low carbon organisation within Sussex, meeting the needs of our patients by providing high quality care with excellent treatment outcomes, whilst ensuring a sustainable future for all.**

Our target and objective is as follows:

- **A reduction in CO<sub>2</sub> emissions from our direct activities by 25% by 2014/2015 from 2008/2009 levels.**
- **To embed carbon management into every process, policy and procedure across our entire organisation. To raise the profile of carbon management with all stakeholders and embed a process of engagement and culture change within the Trust to enable instinctive carbon management by all.**

The potential financial savings to BSUH is around £1.7 million per year by 2015, when inflation and a background increase in emissions is taken into account

However, although we can reduce our energy and carbon emissions in future years, energy prices are still expected to rise year-on-year. This means that we are unlikely to see a corresponding reduction in our expenditure, so we are therefore putting a case for "cost avoidance" rather than "cost reduction", which may not be as easy to demonstrate, but is equally as important.



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## ***How do we get there?***

To a large extent the financial case has already been accepted by BSUH, and we are currently investing significantly in the engineering infrastructure. This is already starting to see a positive impact with energy consumption falling for the first time on record. The current out-turn forecast for 2010/2011 is that gas consumption will fall 4% and electricity by 2% compared with 2009/2010.

Other notable progress has been made through our Green Travel Plan and improved waste management and recycling.

Until now progress on carbon reduction has, in the main, been made by our Facilities and Estates Department. This is an obvious place to start as this is where the initial “quick wins” are achieved. However, there is a limit to what can be accomplished through engineering solutions alone.

We can make initial reductions through these projects, but we can make massive long term savings through successfully engaging with every member of staff and embedding carbon management in to every process, policy and procedure across our entire organisation. We now need to raise the profile of carbon management with all stakeholders and embed a process of engagement and culture change within the Trust to enable instinctive carbon management by all.

This Carbon Management Plan therefore proposes the follow actions:

### **1. Make carbon management a Trust priority.**

Add our “vision” to become “a leading low carbon organisation within Sussex” as an additional Trust priority in the annual document “Our Priorities”.

An absolute key element of the Plan is the need for carbon management to be seen as a corporate goal. If the Chief Executive, the Management Board and Board of Directors are not actively supporting our reduction of carbon emissions and energy consumption, then it will not be seen as an important priority by staff and we will fail to deliver our “vision”.

### **2. Appoint a Sustainability Manager**

To appoint a full time Sustainability Manager whose sole remit will be to ensure the effective delivery of the Plan.

### **3. Staff induction and mandatory training**

To include carbon management as part of the staff induction programme followed by annual updates through mandatory training.

### **4. Job descriptions**

To add specific carbon responsibilities to job descriptions for key individuals, with a general responsibility for all other staff.

### **5. Objectives**

To include carbon reduction objectives within the appraisal system as part of performance management. For some staff this could be the delivery of specific carbon saving projects, however we can also include a section within the “Performance and Development Review: Self Assessment Form” that asks everyone to think of ways in which they contribute.

### **6. Awareness campaign**

To re-launch the Energy and Carbon Awareness campaign.

### **7. Website**

To develop an energy and carbon page on the Trust’s website.



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#### **8. Sustainable Procurement Action Plan**

To produce a “Sustainable Procurement Action Plan” to develop policies to inform purchase decisions.

#### **9. Sustainable Building Design and Construction Policy**

To produce a “Sustainable Building Design and Construction Policy” to ensure designers are briefed to incorporate the Trust’s sustainable requirements for low carbon buildings.

#### **10. 3Ts design**

To ensure that the 3Ts development and St Mary’s Hall are delivered with the lowest carbon impact as reasonably practicable.

#### **11. Business planning**

To ensure that the cost of energy and carbon emissions are considered as part of our business planning process such as: corporate strategies, business cases, and decisions made by the “Product Selection Group” and the “Medical Devices Equipment Group”.

#### **12. Invest to save**

To continue investing in low carbon technology for our Estate.

Projects have already been identified that will achieve an initial carbon reduction of 5,253 tonnes of CO<sub>2</sub> (82% of our target). The investment required for these projects is £1.6m, however the annual savings will equate to about £900k by 2013 based on current prices. Feasibilities are being undertaken to identify further projects that will achieve our target, for which additional investment will be required.



## 1.0 Introduction

Brighton and Sussex University Hospitals NHS Trust (BSUH) was accepted on to the Carbon Trust's "NHS Carbon Management Programme" for 2010 which began in May of that year.

The idea of the programme was to systematically guide Trusts, helping them to analyse their carbon footprint, calculate the value-at-stake and strategically identify opportunities to reduce carbon emissions. The outcome is a fully costed plan to make the business case for cutting carbon.

Most Councils have already been through the programme and since it was extended to the NHS, approximately a third of the 366 Trusts have either completed or are currently working on the programme.

The basis of the approach to the programme is in five steps:



The BSUH Board of Directors has been kept up to date with progress of the programme through the following documents: -

- June 2010 – Board paper on the details of Carbon Management Programme
- August 2010 – Carbon Management Programme, Project Plan
- November 2010 – Business Case for Carbon Reduction

The programme culminates after 10 months with the presentation of this document to the Board of Directors.

- February 2011 – "Saving Carbon, Improving Health", Carbon Management Plan 2011 to 2015.

The purpose of the Carbon Management Plan is to set out how the Trust will meet its obligations under Government policy with regard to carbon reduction but to also outline how it will deliver an agreed and robust cost management plan for energy consumption.

Once the Board has approved the Plan we will have completed Stage 4 and the 10 month support from the Carbon Trust will have ended.

At this point we will have achieved:

- An analysis of the Trust's carbon footprint by measuring our "direct" emissions, (energy, water, waste and transport).
- A calculation of the financial impact to the Trust
- An assessment of the opportunities to reduce carbon emissions
- A programme for implementing reduction opportunities



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Stage 5 (the implementation) will follow and that is when the real work begins. Through implementing the projects outlined in the Plan, the Trust will endeavour to achieve a reduction in CO2 emissions from our direct activities by 25% by 2014/2015 from 2008/2009 levels. To achieve this, every individual and every department within the Trust will need to be engaged.

This is not to say that the Trust has been idle in tackling its obligations in reducing carbon emissions as it has already achieved progress in important areas:

- Since the introduction of the Trust's Green Travel Plan, there has been a significant reduction in vehicle travel. The Plan has been in existence for a number of years and although new schemes are under consideration, it is not anticipated that these will further add significantly to the savings already achieved.
- Carbon emissions due to the Trust's waste going to landfill or incineration has seen a reduction of nearly 25% since the introduction of the recycling scheme. The further reduction of another 25% is a serious possibility.
- Over the past couple of years our Pharmacy team have managed to increase the recycling of medicines returned from the wards. It is estimated that pharmaceutical waste sent for incineration has been reduced by about 600kg per year.
- A number of Estates projects are currently in progress, or have recently been completed, involving the reduction of energy consumption by refurbishing, updating or installing new modern controls to our electrical, heating and ventilation systems. Even with a year-on-year background increase in hospital activity and the associated increase in energy use, there is already evidence to suggest that electrical consumption has begun to fall.



## 2.0 Carbon Management Strategy

### 2.1 Context and drivers for carbon management

#### Global climate change

Man-made CO<sub>2</sub> and other greenhouse gas emissions, known as carbon emissions for short, are believed by the UK government and the majority of the scientific community engaged in the climate field to be a major contributory factor in the increase in global temperature seen since the Industrial Revolution.

Climate change has substantial potential health effects. These include heat stress related to heat waves; injuries related to extreme weather events such as storms, fires and floods; infectious disease outbreaks due to changing patterns of mosquito borne and water borne diseases; poor nutrition from reduced food availability and affordability.

#### UK nationally

Whilst there are still some sceptics the evidence is very strong and the preventative principle has persuaded successive governments to commit to reducing emissions by 80% by 2050 as the UK's contribution to minimising the impact of climate change this century. Government policy to achieve this target will certainly drive up the price of carbon.

#### Public Sector and the NHS

As the World's 4<sup>th</sup> largest employer with 1.3m staff, (behind The Peoples Liberation Army China 2.3m, Wal-Mart Stores 1.8m and Indian State Railways 1.4m). The NHS is a significant emitter of carbon both directly as a user of energy and indirectly as a consumer of goods and services and so will not be immune from these increased costs.

The case for carbon reduction is strengthened by the financial constraints that the NHS faces. With little real growth in NHS expenditure and increased demand for services, there is a significant incentive to reduce energy and therefore carbon, to release cash for frontline services. A recovering world economy, limitations on energy supply and a more challenging regime in terms of carbon taxation, will drive energy prices above general inflation for the foreseeable future. The reduction in carbon should not just apply to the Trust's direct energy consumption if we are to achieve cost efficiencies, but also to the supply chain of our suppliers of goods and services.

The recent White Paper "Equality and Excellence – Liberating the NHS", specifically addresses carbon and energy efficiency. It states *.. "Further efficiencies can, and need to, be made from improving energy efficiency and developing more sustainable forms of delivery across the NHS, for example through working with the Carbon Trust and similar bodies on carbon reduction programmes that reduce energy consumption and expenditure."*

Public sector leadership is critical to the achievement of the Government's climate change objectives, such as the long term goal to reduce CO<sub>2</sub> emissions by 80% by 2050 in the Climate Change Bill. This has created a number of legislative drivers for public bodies including the "Climate Change Act", "Display Energy Certificates" and the "Carbon Reduction Commitment".

The NHS Sustainable Development Unit (SDU) in turn produced the strategy "Saving Carbon, Improving Health" which included a foreword from David Nicholson (NHS Chief Executive). The NHS has therefore pledged to become one of England's leading sustainable and low carbon organisations.



## Health impact of climate change in the UK

The Department of Health produced a report in 2001/2002 with an update in 2008 on the “Health impact of climate change in the UK”. The following is an extract.

*“How we respond to climate change, both globally and in the UK, is an issue of public concern. To date, the main focus has been on the likely environmental and economic outcomes. However, there is growing recognition that there may be significant impacts from climate change on human health.*

*While the UK national assessment acknowledged the uncertainties surrounding predictions of likely effects of climate change, it identified a number of potential health impacts by the 2050s:*

- *Extremes of temperature - heat-related deaths could increase to around 2,800 cases per year. This is likely to be offset by milder winters leading to a fall in cold related winter deaths of up to 20,000 cases per year.*
- *Flooding – it is predicted that there will be an increased frequency of severe coastal and river floods, both of which can have severe impacts on health. Analysis of more recent river flooding in the UK shows that mental health problems are the most important health impact among flood victims due to experience of personal and economic loss and stress.*
- *UV exposure – levels of UV radiation reaching the earth’s surface may increase due to sunnier summers, a decline in cloud cover and ozone depletion (which reduces the capacity of the ozone layer to absorb UV). Whether this will lead to increased UV exposure depends on people’s behaviour. Overall, the DoH assessment predicted an extra 5,000 cases of skin cancer and 2,000 of cataract per year by 2050.*
- *Vector-borne diseases – various diseases transmitted by mosquitoes or ticks are climate-sensitive and can increase or be introduced due to climate change. Malaria might be re-established in the UK. The health impacts of this are likely to be localised, but more cases could be imported among travellers returning to the UK. The emergence of tick-borne encephalitis is unlikely; the impact of climate change on the incidence of Lyme disease is difficult to predict. Monitoring will also need to look for the emergence of other vector-borne diseases, such as West Nile Fever.*
- *Food poisoning - higher temperatures in summer could cause an estimated 10,000 extra cases of salmonella infection per year.*
- *Water-borne disease – climate change might increase levels of cryptosporidium and campylobacter in water. Secure sanitation systems should safeguard supplies of drinking water, but possible contamination of stormwater outflows could carry disease into basements and nearby rivers, affecting the health of residents and river users.*
- *Storms – any increase in the frequency of severe winter storms could lead to an increase in personal injuries from flying debris and falling trees.*
- *Air pollution - a reduction in the cold, calm winter weather associated with winter air pollution episodes together with reduced emissions of key pollutants including particles, oxides of nitrogen and sulphur dioxide could lead to a reduction (up to 50%) in the adverse health effects of winter air pollution. A small overall increase in the number of summer ozone episodes coupled with a longer-term increase in background levels of ozone could cause a rise in the number of premature deaths.”*

A six-month Government investigation recently concluded in 2010. According to the environment audit committee, minute sooty particles, emitted largely from the burning of diesel and other fuels and inhaled deeply into the lungs, shortens lives by seven to eight months. In pollution hotspots like areas of central London and other cities, the particles could be cutting vulnerable people’s lives short by as much as nine years.

Brighton is not immune to this problem and Brighton and Hove City Council has set up an “Air Quality Management Area” which extends from Portslade to the Marina and incorporates the Royal Sussex County Hospital.



The Council continually monitors the air quality and issues warnings when the air quality is forecast to be poor enough to give possible problems. BSUH can help the Council by doing all it can to minimise hospital traffic generated by staff, patients, visitors and goods deliveries, (e.g. a park & ride scheme outside the Air Quality Management Area).

### **Brighton and Sussex University Hospitals NHS Trust**

The Carbon Management Plan supports the Trust's published "Our Priorities 2010/2011" with regard to, "Building for the Future" and "Financial Sustainability".

The Trust faces a number of strategic challenges that will have an impact on carbon emissions:

- **3Ts Development and St Mary's Hall**

With regard to the 3Ts redevelopment of the Royal Sussex County Hospital, a sustainability brief has been developed and handed to the project team, outlining the Trust's stringent energy and environmental requirements. The Department of Health also requires that all new builds achieve an "Excellent" rating under BREEAM, (BRE Environmental Assessment Method), which sets the standard for best practice in sustainable design. The design team for St Mary's Hall (which is initially to be used as a decant for 3Ts), has been given a similar sustainability brief.

- **Foundation Trust Application and Cost Reduction**

The Plan will act as a driving force in reducing energy costs and helping achieve the necessary financial stability required for Foundation Trust status. Good carbon management offers the opportunity of achieving genuine efficiencies and cost savings without having to make a single cut to patient services or staff numbers.

- **Quality, Innovation, Productivity and Prevention (QIPP) Agenda**

To meet the current financial challenge to the NHS, organisations must focus on sustaining quality, improving services and meeting rising demand. Although this is set against a background of shrinking resources, the efficiencies and savings derived from all aspects of carbon management will help support this agenda.



In addition, space management is an essential tool in optimising the utilisation of the estate. Better analysis of space and operational costs will provide essential information to the Finance Department for “Service Line Costing”. This, together with improvements in the monitoring of energy for individual buildings will also inform the Estate Strategy with regard to the rationalisation of the Trust’s estate.

- **Good Corporate Citizen**

Finally and not to be under-estimated is the need for BSUH to be seen as a leader in the local community with regard to sustainability. Climate Change if left unchecked is expected to have significant impacts on public health, and we need to be seen to be taking positive action.

## 2.2 Our low carbon vision

**To become a leading low carbon organisation within Sussex, meeting the needs of our patients by providing high quality care with excellent treatment outcomes, whilst ensuring a sustainable future for all.**

## 2.3 Strategic themes

The following themes encompass the majority of activity that will move the Trust towards our vision.

- **Policy alignment and optimisation of existing systems**

In ensuring that carbon reduction is embedded throughout the management of the Trust, rather than create a host of new policies, procedures, meetings and governance processes, it is intended to examine and adapt what is already in place.

- **Communication and engagement**

Raising awareness and changing attitudes and behaviour amongst all staff so that carbon reduction becomes an every day habit.

- **Invest to save projects**

Carbon reduction equates to financial savings. Therefore we will continue to develop business cases to invest in opportunities to reduce energy consumption, for example: through improvements to buildings, engineering plant and information technology, medical equipment etc.

## 2.4 Targets and objectives

- **A reduction in CO2 emissions from our direct activities by 25% by 2014/2015 from 2008/2009 levels.**
- **To embed carbon management into every process, policy and procedure across our entire organisation. To raise the profile of carbon management with all stakeholders and embed a process of engagement and culture change within the Trust to enable instinctive carbon management by all.**



## 3.0 Emissions Baseline and Projections

### 3.1 Scope

Brighton and Sussex University Hospitals NHS Trust occupies over 90 properties with a total area of 150,511m<sup>2</sup>. The Trust's "direct" emissions are over 25 thousand tonnes of carbon dioxide per year. To put this into perspective, our total emissions are equivalent to the emissions from over 4 thousand homes.

"Direct" emissions include:

- electricity
- gas
- oil
- water
- waste
- staff/patient transport.

We only measure our "direct" emissions because calculating all our "indirect" emissions of our procurement activities would be extremely difficult and time consuming. However, we are acutely aware of the indirect impact on carbon emission released through our procurement of goods and services. In fact these have a far greater impact than our direct emissions.

The NHS Sustainable Development Unit's publication, "Saving Carbon and Improving Health" indicates that the NHS as a whole has a carbon footprint of 18 million tonnes CO<sub>2</sub> per year. This is composed of:

- Building Energy (22%),
- Travel (18%)
- Procurement (60%), split as follows:

Pharmaceuticals	22%
Medical instruments/equipment	9%
Business services	5%
Paper products	5%
NHS Freight transport	4%
Other manufactured products	3%
Manufactured fuels/chemicals/gases	3%
Food and Catering	2%
Construction	2%
Information and Communication	2%
Water and sanitation	1%
Waste products and recycling	1%
Other procurement	1%

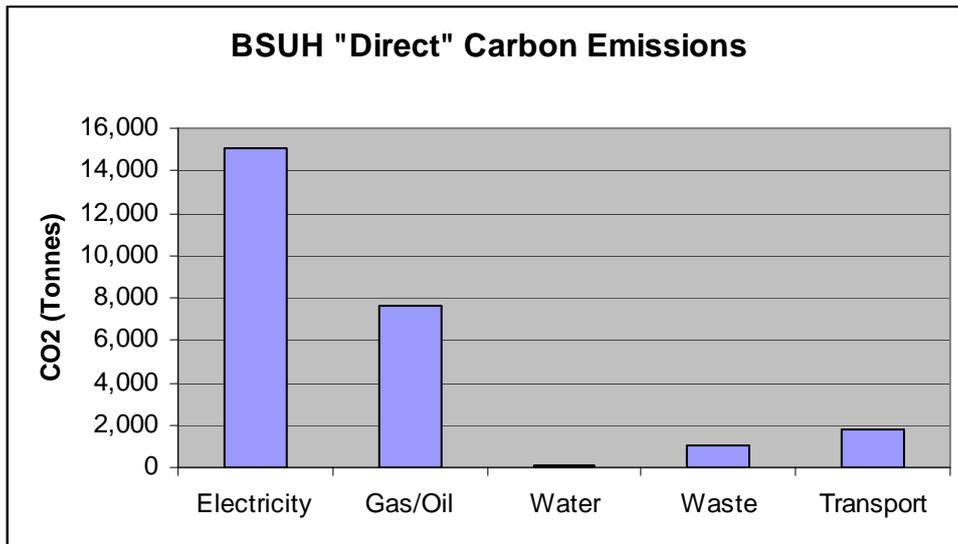
Although we do not measure the carbon impact of the manufacturing process, the goods we purchase will have an impact on our emissions and costs, so we need ensure that we consider energy performance, packaging, waste and whole life costings as part of our procurement decisions.

Consideration of procurement is addressed in a later section, however, this Plan largely deals with the management of "direct" emissions.

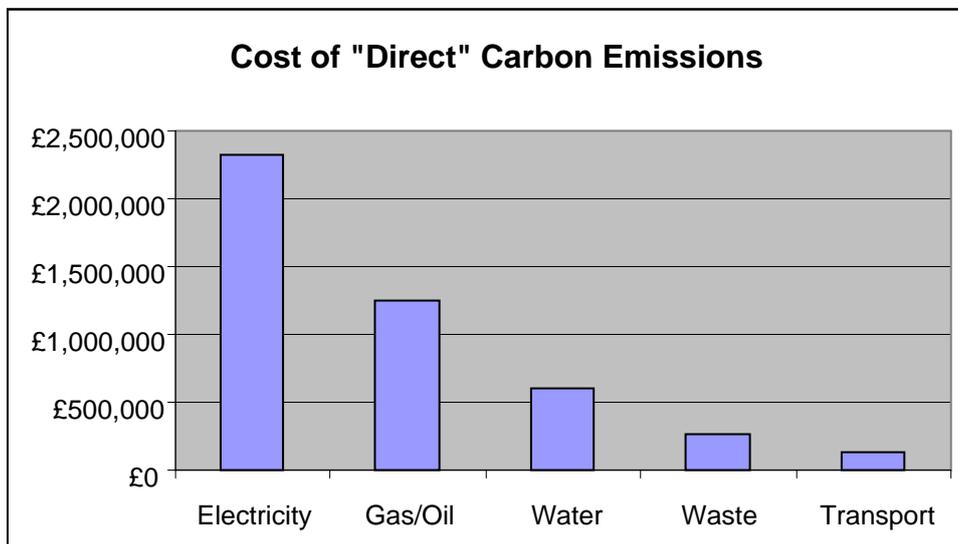


### 3.2 Baseline

In 2008/2009 our direct emissions were 25,558 tonnes of CO<sub>2</sub> which is split as follows:



Our annual bill from these emissions equates to about £4.5 million each year:



In addition, from April 2013 we will be subject to the Carbon Reduction Commitment Energy Efficiency Scheme (CRC), which is the UK's mandatory climate change and energy saving scheme. CRC is basically a tax on carbon emissions from utilities. It is expected to cost the Trust about £300k a year but will be reduced as we lower our carbon emissions.

Therefore a reduction in carbon emissions is equivalent to significant cost savings.



### 3.3 Projections and Value at Stake

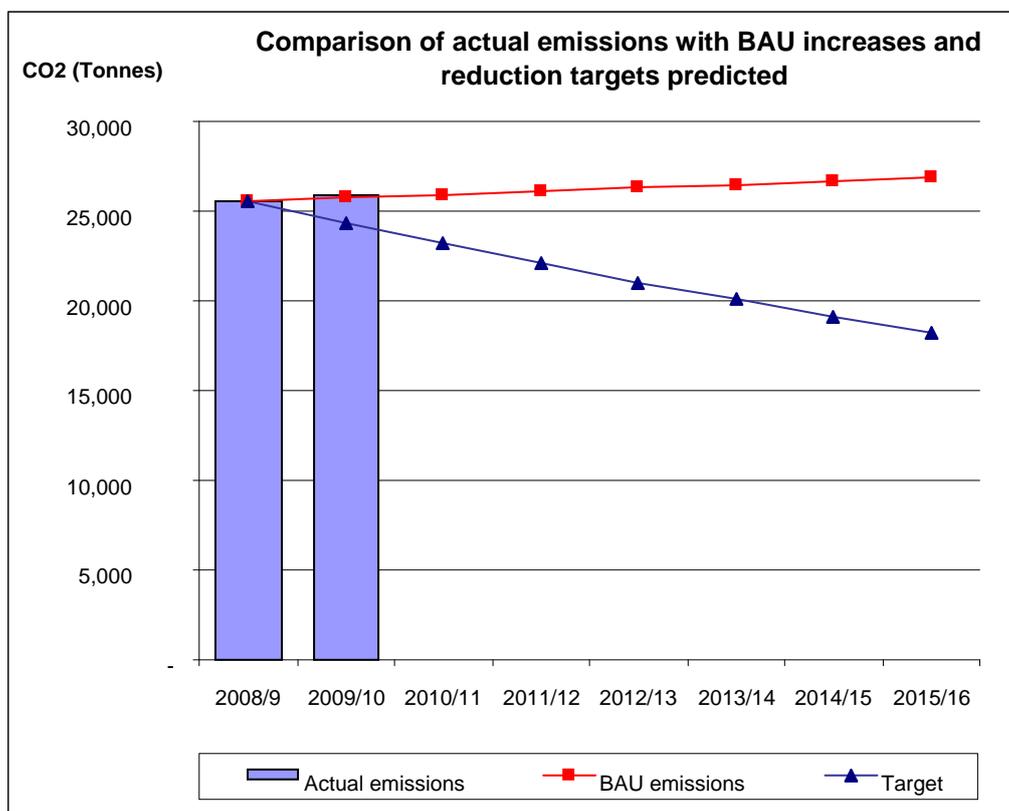
For the purposes of this Plan we have set a target reduction of 25% in direct emissions from the 2008/2009 baseline year.

Any increase in hospital activity has a direct correlation to an increase in energy use, the quantity of goods procured, waste produced and hence the Trust’s carbon footprint.

Everybody who works in the Trust is very much aware of the year-by-year increase in activity and the demands this places on our resources. Our hospitals have never been busier with 3 session days in theatres and Saturday working becoming a regular occurrence. Our beds seem to be constantly full and clinics overflowing.

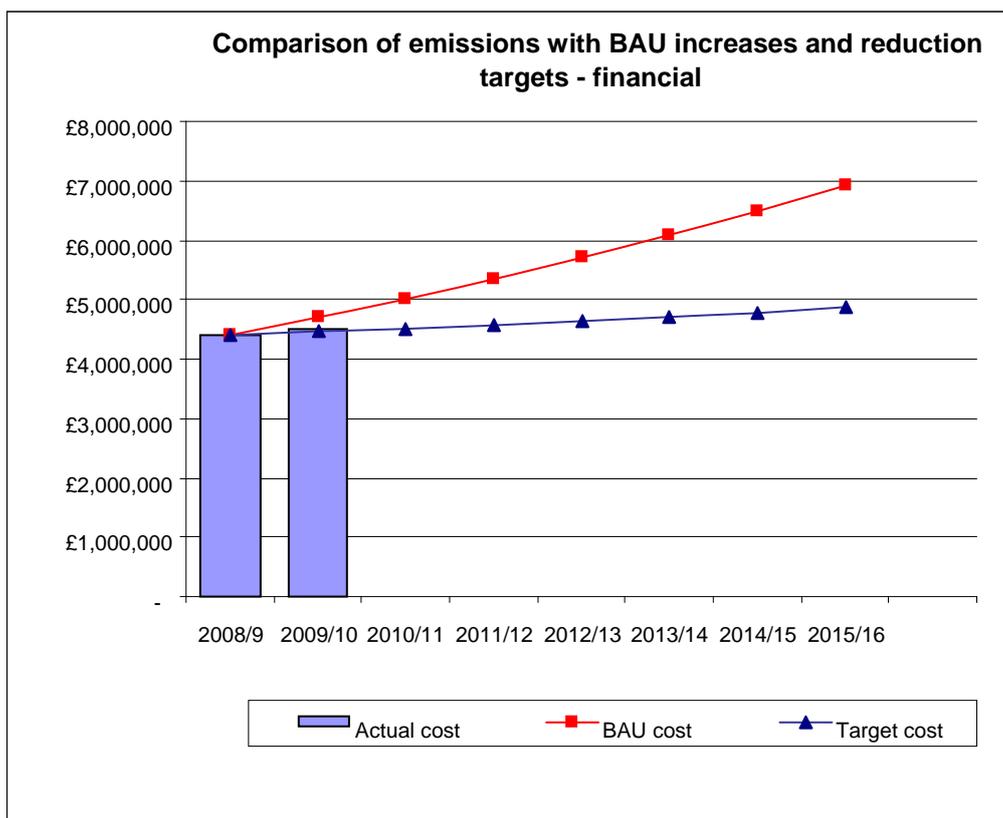
The advances in equipment used in the treatment of patients have also had an effect. The range of equipment that surrounds a patient bed today would be unrecognisable from that of 10 years ago, and of course most beds are now electric. This means that we have to stop any growth in emissions before we can start to achieve this target. We have accounted for a background growth rate of 0.7% per annum, however this paper demonstrates that we can no longer continue to grow in an unsustainable manner. Ample consideration must be given to the impact this growth has on our carbon footprint and the wider impact on the environment.

The 25% target relative to where we would be should we take no action is therefore nearer 29%. This can be shown graphically as in the figure below. The red line forecasts what will happen to our carbon emissions should we take no action, i.e. “business as usual” (BAU). The blue line indicates our reduction target.





When inflation is included the potential savings or “value at stake” (VAS) can be seen. If the target savings in emissions are achieved, the financial savings by 2014/15 will have risen to £1.7million per year, and cumulatively this amounts to £5.7m. This is shown graphically in the figure below:



Year	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
Total Value at Stake (£)	£242,444	£500,159	£774,205	£1,065,723	£1,375,936	£1,706,157
Cumulative value at stake (£)	£242,444	£742,603	£1,516,808	£2,582,532	£3,958,468	£5,664,625

The key message that must be taken from this graph is that although we can reduce our energy and carbon emissions in future years, energy prices are still expected to rise year-on-year. This means that we unlikely to see a corresponding reduction in our expenditure, so we are therefore putting a case for “cost avoidance” rather than “cost reduction”, which may not be as easy to demonstrate, but is equally as important.



## 4.0 Carbon Management Projects

### 4.1 Projects currently funded:

Ref	Project	Lead	Cost		Annual Savings		Pay back (yrs)	% of Target	Start Year
			Initial Cap/Rev	Annual Revenue	Revenue	CO <sub>2</sub> Tonnes			
1	PRH Main Building Remedials & re-commissioning controls & re-heater batteries in the remaining areas of the building	Dawn Moss	£90,617	£0	£15,980	98.0	5.7	1.5%	2010
2	PRH Main Building Re-Heater Batteries	Dawn Moss	£20,000	£0	£11,340	69.5	1.8	1.1%	2010
3	PRH & RSCH Multiple Buildings Coordinate & Controls Integration of the Variable Speed Drives	Dawn Moss	£0	£0	£127,775	695.3	0.0	10.9%	2010
4	PRH & RSCH Site-wide Audit & timeclock controls to DX units	Dawn Moss	£0	£0	£25,000	136.0	0.0	2.1%	2010
7	RSCH Sussex Kidney Controls Re-commissioning	Dawn Moss	£15,500	£0	£13,215	81.0	1.2	1.3%	2011
8	RSCH Millennium Building Controls Assessments & Remedials (Recuperator controls)	Dawn Moss	£0	£0	£75,000	459.9	0.0	7.2%	2010
10	RSCH Boiler House Heavy oil removal	Bob Mills	£0	£0	£39,422	214.5	0.0	3.4%	2010
16	RSCH AEB Controls remedial & re-commissioning and plant energy economising changes	Dawn Moss	£5,000	£0	£8,550	52.4	0.6	0.8%	2010
17	RSCH Sussex Eye Controls remedial & re-commissioning and plant energy economising changes	Dawn Moss	£10,000	£0	£7,500	46.0	1.3	0.7%	2011
18	RSCH Barry Building Correct faults with heating and reset set points	Bob Mills	£5,000	£0	£23,332	143.1	0.2	2.2%	2011
20	PRH & RSCH Waste. Improve segregation and increase recycling. 25% carbon reduction target.	Martin McLachlan	£1,000	£0	£22,702	211.4	TBC	3.2%	2011
21	Provide intranet based energy reporting through installation of "Meterweb"	Dawn Moss	£2,000	£0	N/A	N/A	N/A	0%	2011
38	Sussex Eye. Lighting upgrading project	Russell Middleton	£12,300	£0	£10,510	57.2	1.2	0.9%	2010
	<b>SUB TOTAL</b>		<b>£161,417</b>	<b>£0</b>	<b>£380,328</b>	<b>2264.3</b>		<b>35.4%</b>	



## 4.2 Proposals for future projects

Business cases currently being prepared:

Ref	Project	Lead	Cost		Annual Savings		Pay back (yrs)	% of Target	Start Year
			Initial Cap/Rev	Annual Revenue	Revenue	CO <sub>2</sub> Tonnes			
5	RSCH AEB Voltage Optimisation	Barry Kearton	£16,000	£0	£4,594	25.0	3.5	0.4%	2011
6	RSCH Operating theatre run-round coils	Dawn Moss	TBC	TBC	TBC	TBC	TBC	TBC	2011
9	RSCH Pathology Environmental controls recommissioning	TBC	£25,000	£0	£54,900	298.8	0.5	4.7%	2011
11	PRH Site-wide Main boiler house shutdown & replacement with summer thermal load facility	Dawn Moss	£75,000	£0	£90,000	551.9	0.8	8.6%	2011
12	PRH & RSCH Site-wide energy & carbon awareness campaign. 4% carbon reduction target.	TBC	£20,000	£0	£188,492	1059.9	0.1	14.8%	2011
13	RSCH Level 6 Energy recovery from chilled water	TBC	£140,000	£0	£33,690	206.6	4.2	3.2%	2011
14	RSCH Sussex House & Annexe Boiler & building controls & Remedials	TBC	£8,000	£0	£13,710	84.1	0.6	1.3%	2011
15	RSCH Thomas Kemp RSCH operating theatre set-back controls - verification and re-commissioning	TBC	£25,000	£0	£7,000	38.1	3.6	0.6%	2011
19	PRH Replace existing boilers with CHP	Barry Kearton	£1,082,000	£0	£146,873	837.0	7.4	13.1%	2012
<b>SUB TOTAL</b>			<b>£1,391,000</b>	<b>£0</b>	<b>£518,767</b>	<b>2988.9</b>		<b>46.7%</b>	

<b>GRAND TOTAL</b>			<b>£1,552,417</b>	<b>£0</b>	<b>£899,095</b>	<b>5,253.1</b>		<b>82.2%</b>	
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**Please note:**

With the exception of Item 20 (waste), all projects listed in 4.1 and 4.2 have been independently reviewed by external energy consultants to ensure that the cost estimates, savings and CO<sub>2</sub> reductions indicated are reasonable and achievable.



**Feasibility studies to be undertaken:**

Ref	Project	Lead	Cost		Annual Savings		Pay back (yrs)	% of Target	Start Year
			Initial Cap/Rev	Annual Revenue	Revenue	CO <sub>2</sub> Tonnes			
30	PRH. Elimination of multiplexing in the controls (remaining vestiges)	TBC	TBC	TBC	TBC	TBC	TBC	TBC	2012
31	PRH. Operating Theatre Suite - Replacement of Johnson Controls & re-implementation	TBC	TBC	TBC	TBC	TBC	TBC	TBC	2012
33	PRH. Install plate heat exchanges	TBC	TBC	TBC	TBC	TBC	TBC	TBC	2012
34	PRH & RSCH. Fit timers to Zip Boilers	TBC	TBC	TBC	TBC	TBC	TBC	TBC	2012
35	PRH & RSCH. Additional sub-metering	TBC	TBC	TBC	TBC	TBC	TBC	TBC	2011
36	PRH & RSCH. Quadraseal draft elimination works	TBC	TBC	TBC	TBC	TBC	TBC	TBC	2012
37	CIRU. Environmental controls recommissioning	TBC	TBC	TBC	TBC	TBC	TBC	TBC	2012
39	Thomas Kemp Tower. Perimeter heating system alterations	TBC	TBC	TBC	TBC	TBC	TBC	TBC	2013
40	AEB. Reduce to one calorifier	TBC	TBC	TBC	TBC	TBC	TBC	TBC	2011
41	Sussex House. Water boiler & time clock controls to DX units	TBC	TBC	TBC	TBC	TBC	TBC	TBC	2012
42	PRH & RSCH. Upgrade insulation to exposed pipework	TBC	TBC	TBC	TBC	TBC	TBC	TBC	2012
43	RSCH OPD. Build new external plant room and fit new boiler	TBC	TBC	TBC	TBC	TBC	TBC	TBC	2012
44	Sussex House. Zoning of heating circulation system	TBC	TBC	TBC	TBC	TBC	TBC	TBC	2013
45	RSCH Overhaul BMS system	Dawn Moss	£60,000	TBC	TBC	TBC	TBC	TBC	2011
46	Thomas Kemp Tower. Install digital burner controls to boilers.	TBC	£30,000	TBC	TBC	TBC	TBC	TBC	2011
47	SSD. High efficiency steam generators.	TBC	TBC	TBC	TBC	TBC	TBC	TBC	TBC
48	SSD. Recycling of RO reject water.	TBC	TBC	TBC	TBC	TBC	TBC	TBC	TBC



### 4.3 3Ts Development

The 1<sup>st</sup> phase of 3Ts is unlikely to be delivered before April 2015 which is outside the timeframe for our Carbon Management Plan. The carbon impact of the design is a key consideration, however at this stage it has yet to be fully evaluated. Therefore, for the purposes of this Plan the 3Ts implications have not been incorporated. However, it is clear that the 3Ts design will have a massive impact on the Trust's future carbon emissions and the completed development will have a total floor area roughly twice the size of the buildings it replaces. Therefore the approach to carbon management within the design is of immense importance to the Trust.

Appendix B contains a summary of the "3Ts Carbon Management Proposals"

### 4.4 Waste management

Carbon emissions due to the Trust's waste going to landfill or incineration has seen a reduction of nearly 25% since the introduction of the recycling scheme. The further reduction of another 25% is a serious possibility and the Waste Management Team has set themselves the following targets to be achieved by the end of March 2012.

#### Recycling

We currently recycle plastic, glass, paper, ink cartridges, aluminium cans and cardboard. We will increase recycling by 25%. This will be achieved by increasing audits in all areas to check that correct segregation is followed and improving awareness and training to help staff understand their responsibilities. In addition, we will be working closely with all our waste contractors to find new and innovative ways for re-use or recycling.

#### Clinical waste

Clinical waste is sent for incineration or autoclaving before going to landfill. We will review all areas within the Trust that use Yellow Bags and reduce by 25%. This will be achieved by increasing audits in all areas to check that correct segregation is followed and improving awareness and training to help staff understand their responsibilities.

#### Battery recycling

Most batteries are currently disposed of through the domestic waste stream. We will review all areas within the Trust that use batteries and increased recycling by 90%. This will be achieved with a small initial capital outlay for containers and partnering a company who will collect the batteries for free.

#### Mattresses

Up to recently, all mattresses were being sent to disposal by incineration. However, non-contaminated mattresses can be sent to "Deep Landfill". With improved awareness training, staff will be able to identify which method of disposal should be utilised. In 2010 we sent 320 mattresses for incineration and this year we anticipate diverting 90% to Deep Landfill.

#### Wood

All wood is currently compacted and/or sent to landfill. We will intend to segregate wood from other waste and send for re-use or recycling.

#### Pallets, containers & packaging

Waste Management and Procurement Teams are currently discussing how we can oblige suppliers to remove their pallets, containers, packaging etc for re-use, rather than leaving for the Trust to dispose of the items.



## 4.5 Space Management

Next to our staff, buildings are our most valuable asset. However, the more buildings we have, the greater our carbon emissions and operational costs. Therefore it is essential that we utilise space in the most efficient way possible.

The Trust has just approved the purchase of space management software that will enable us to: improve utilisation of space, help cost avoidance due to reduced demand, explore the opportunities for estate rationalisation through property disposals, provide accurate financial analysis of operational costs for service line apportionment and provide a comprehensive management reporting facility.

The initial implementation should be complete towards the end of this summer.

## 4.6 Information Technology

The Trust's Health Informatics Strategy (June 2010) sets out a clear direction for investment and supports the strategic direction of the Trust. Information technology is an important tool in supporting the push to become a low carbon organisation. There are a number of IT projects being developed that will help with this goal:

Project	Implementation
<ul style="list-style-type: none"> <li>Electronic patient records &amp; image storage (EPR) - will reduce paper and requirements for storage.</li> </ul>	2011 to 2014
<ul style="list-style-type: none"> <li>Consolidation of server rooms - will reduce electricity costs.</li> </ul>	2012 to 2014
<ul style="list-style-type: none"> <li>Data management systems - will reduce demand for server space.</li> </ul>	2012 to 2014
<ul style="list-style-type: none"> <li>"Telehealth" - where patients can be monitored from home instead of travelling into hospital. This has already started in Renal and other areas will follow with the introduction of EPR.</li> </ul>	2010 onwards
<ul style="list-style-type: none"> <li>New Data Centre - as part of the 3Ts programme, this would be significantly more energy efficient and offer the potential for recycling the heat produced.</li> </ul>	2013 to 2014
<ul style="list-style-type: none"> <li>Video and audio conferencing via P.C.s - to reduce the need for business travel. Technology in place 9 to 18 months but needs business case.</li> </ul>	TBC
<ul style="list-style-type: none"> <li>PC power management - to automatically shut down computers left on and save electricity. Technology in place 18 months but needs business case.</li> </ul>	TBC
<ul style="list-style-type: none"> <li>Remote working - to allow flexible working where staff can work from home will reduce car travel, free up parking spaces for patients and reduce the demand on space. This is already supported but requires a Trust Policy for wider implementation.</li> </ul>	TBC
<ul style="list-style-type: none"> <li>Lap-tops or tablets for those who regularly attend meetings - to reduce amount of paper printed off. Could be implemented 9 to 18 months but needs business case.</li> </ul>	TBC

Many of these IT projects will also have the added benefit of helping to reduce the demand for space.



## 4.7 Green Travel Plan

Since the introduction of the Trust's Green Travel Plan, there has been a significant reduction in vehicle travel whilst delivering significant savings. The 40x inter-site bus service alone currently caters for 14,000 staff and 500 patient journeys each month.

Recent projects implemented include:

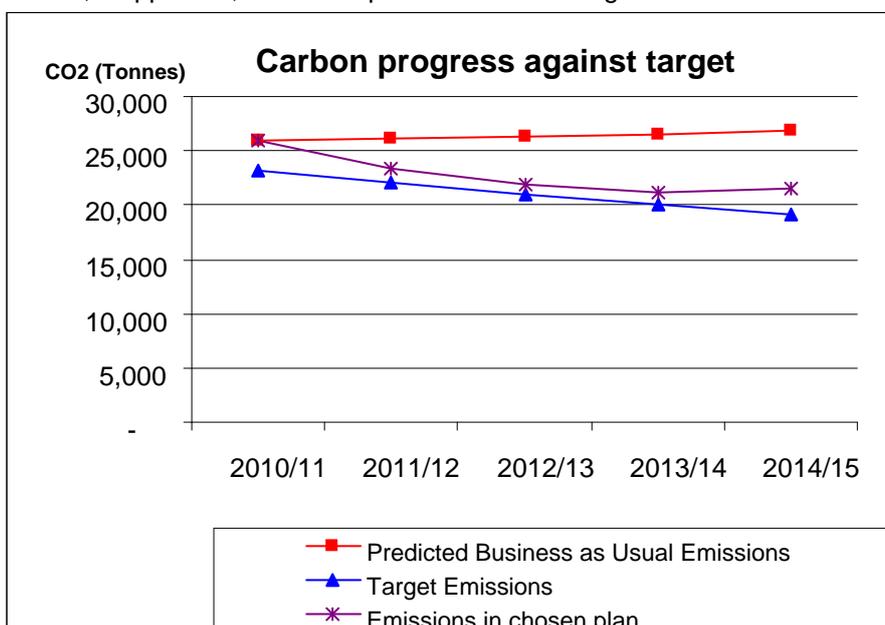
- Amalgamation of all courier services to save journeys. This has involved increasing the frequency of "pick ups" and using motorbikes instead of vans.
- Introduction of cycle-loan scheme. Although over 200 bikes sold, the number of motorists that have moved to bikes is unknown, however at an average price of £500, the Trust has saved National Insurance/Tax contributions in the region of £20k a year.
- Introduction of bus-pass scheme for staff.

Further schemes under consideration include:

- Increasing the frequency and duration of the inter-site 40x bus service.
- Increasing the current number of cycle parking facilities from around 80 on the RSCH site to approximately 220
- Encouraging a wider uptake of the existing of Liftshare scheme though the introduction of dedicated parking bays.
- Amending the policy for pool cars use to encourage wider use by staff.
- Introducing a 'sliding scale' permit charge for staff permits, aligned with CO<sub>2</sub> output (or engine size for older vehicles) to reward the use of more efficient vehicles.

## 4.8 Projected Achievement towards Target

The graph below shows that the existing funded projects should save 5,253 tonnes of CO<sub>2</sub>, which equates to 82% of our target emission savings of 6,390 by 2015. However, the unquantified projects previously described, if approved, should help us achieve our target in full.





## 5.0 Carbon Management Plan Financing

### 5.1 Assumptions

In calculating the estimated costs and savings, the following assumptions have been made:

- There will be a background growth in carbon emissions of 0.7% per annum.
- There will be a continuous growth in the cost of fuel.
- The relocation of staff to St Mary's will be balanced against the closure of the buildings vacated.
- That the 3Ts Development will not be completed before March 2015
- The energy costs from the 3Ts construction activities will be included within the capital funding.
- The Trust is able to provide the requisite funding for the listed projects.
- That the appointment of a Sustainability Manager is approved.

### 5.2 Benefits / savings – quantified and un-quantified

The current forecast for annual savings in term of cost and tonnes of CO2 are summarised below:

Savings forecast	2010/11	2011/12	2012/13	2013/14	2014/15
Annual cost saving	£0	£485,775	£752,222	£899,096	£899,096
Annual tonnes CO2 saving	0	2870	4416	5253	5253
% of 25% target achieved	0%	45%	69%	82%	82%

(NB: these figures do not take into account the background increase in carbon emissions or projected cost inflation.)

There are also unquantified benefits:

- That we can demonstrate our commitment in meeting our obligations regarding climate change and the health of the community we serve.
- That staff can become directly involved in identifying efficiencies required by the QIPP agenda.
- With the Trust being required to tender for more services in future, being able to demonstrate our environmental credentials is a key factor in the adjudication of bids.

### 5.3 Additional resources

Annual operational costs (revenue) are not expected to increase significantly due to the projects outlined. However, there is a strong case for employing a full-time Sustainability Manager as later described in 7.3. This is likely to be a Band 7 post (£38,075), but the cost of employment is expected to be more than offset by the successful delivery of the Plan.



## 5.4 Financial costs and sources of funding

Funding for projects will be from both capital and revenue. Smaller projects with short pay-backs can be funded through in-year savings achieved from the energy budget, which is the case with many of the projects already in progress. Larger schemes with longer pay-backs will require capital allocations.

It is not anticipated that there will be a significant requirement for an increase in revenue streams, with the exception of the appointment of a Sustainability Manager.

The key financial metrics are summarised below.

Cost forecast	2010/11	2011/12	2012/13	2013/14	2014/15
Total annual capital cost	£127,917	£342,500	£1,082,000	£0	£0
Total annual revenue cost	£0	£0	£0	£0	£0
<b>Total costs</b>	<b>£127,917</b>	<b>£342,500</b>	<b>£1,082,000</b>	<b>£0</b>	<b>£0</b>
<b>Net cumulative savings</b>	<b>- 127,917</b>	<b>143,275</b>	<b>- 329,777</b>	<b>899,095</b>	<b>899,095</b>

(NB: these figures do not take into account the background increase in carbon emissions or projected cost inflation.)



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## 6.0 Actions to Embed Carbon Management in BSUH

### 6.1 Corporate Strategy – embedding CO<sub>2</sub> saving across the organisation

An absolute key element of the CMP is the need for carbon management to be seen as a corporate goal. If the Chief Executive, the Management Board and Board of Directors are not talking about reducing our carbon emissions and energy consumption, then it will not be seen as an important priority by staff and we will fail to deliver our “vision” to become “a leading low carbon organisation within Sussex”.

It is therefore proposed that our vision is included as an additional Trust priority in the annual document; “Our Priorities”.

Consideration was given to include it within the “building for the future” priority, however that could give the impression that it was just an Estates and Facilities responsibility which is a view that we have been trying to dispel. We need to ensure that carbon management is accepted as being the responsibility of everyone who works for BSUH.

### 6.2 Responsibility – being clear that saving CO<sub>2</sub> is everyone’s job

To help embed carbon management and succeed in getting Trust wide commitment, not only is clear leadership essential from the Chief Executive, Management Board and Board of Directors, but individuals also need to become personally responsible.

The “Awareness and Engagement Campaign” described in 6.4 will help to engage staff and provide guidance on how they can contribute.

It is also proposed to add specific carbon responsibilities to job descriptions for key individuals, with a general responsibility for all other staff.

Objectives should also be included within the appraisal system as part of performance management. For some staff this could be the delivery of specific carbon saving projects, however we can also include a section within the “Performance and Development Review: Self Assessment Form” that asks everyone to think of ways in which they contribute.

### 6.3 Data Management – measuring the difference, measuring the benefit

In recent years the Trust has invested in a monitoring and targeting system for electricity and gas. This has involved the installation of meters across the two sites to enable real-time reporting of energy use. The system automatically monitors key energy streams and compares them to best previous performance, thus quickly identifying abnormally high energy use for investigation. Benchmarking is also used to help identify where further improvements can be made.

In addition, a bolt-on application has just been purchased called “Meterweb”. It is browser based so available to anyone on the Trust’s network with the appropriate permissions. The package has a fully configurable 'dashboard' presentation that can report on metered energy use for individual areas or departments together with the carbon implication and cost. Inter-department league tables can also be produced.

It is proposed that the overall carbon reduction performance of the Trust will be reported annually to the Board of Directors and regularly updated on the Trust web-site to show progress against target.



## 6.4 Communication and Training – ensuring everyone is aware

This is where we can make a really significant difference by embedding carbon management within the entire organisation through changing daily habits and getting people to consider carbon management as part of everyday decisions. This may be from turning a light off, switching off equipment when not in use, considering the energy implications when purchase of goods, or when making business decisions.

We can make initial reductions through projects led by our Facilities and Estates Teams but we can make massive long term savings through successfully engaging with every member of staff. Thankfully most people are already genuinely concerned about climate change but perhaps need more guidance on how they can contribute.

### Energy and Carbon Awareness Campaign

Two years ago we launched an Energy Awareness Campaign and an Energy Website. More than 50 Energy Champions were also recruited. However, despite this raising the profile of the carbon agenda within the Trust, the campaign has clearly flagged of late and needs re-invigorating. The establishment of a network of energy/carbon champions across departments to build engagement at the local level can double the effectiveness and longevity of an awareness campaign.

In hindsight, the campaign was big on enthusiasm and effort, but perhaps lacked a clear strategy and plan. Therefore we will work with the Trust's Communication Team to produce an initial 12 month Communication Plan. It will initially focus on 3 topics:

- electricity use
- recycling
- alternative transport

***“Switch it off, recycle, take the bus, walk or bicycle!”***

Awareness campaigns obviously have varying success but an effective one can deliver savings of up to 10% carbon emissions. We have set an initial target of 4% which could equate to over £180k savings.

### Website

We will further develop and maintain the existing energy section on the Trust's website and expand it to incorporate all environmental and carbon issues i.e. energy, waste and recycling, transport and sustainable procurement. The site will report on the Trust's green credentials and on progress towards our vision. It will also give advice to staff and public on what they can do to reduce carbon emissions at home as well as at work.

The page is currently lost deep within the Trust's website. It is therefore proposed to have a link on the “home” page of both the internal and external site, so that staff, the general public, doctors and commissioners can immediately see that we are serious about our obligations towards our environment, climate change and the health of the community we serve.

### Human Resources and Training

To ensure that carbon management is embedded within the organisation and part of everyone's job, we have included the following HR work streams:

- **Staff Induction and Mandatory Training**  
To include carbon management as part of the Staff Induction Programme followed by annual updates through Mandatory Training.



- **Job Descriptions**

It is proposed to add specific carbon responsibilities to job descriptions for key individuals, with a general responsibility for all other staff.

- **Objectives and appraisals**

Objectives should also be included within the appraisal system as part of performance management. For some staff this could be the delivery of specific carbon saving projects, however we can also include a section within the “Performance and Development Review: Self Assessment Form” that asks everyone to think of ways in which they contribute.

In addition, remote working, which allows staff to work from home or other locations, will reduce car travel, free up parking spaces for patients and reduce the demand on space. This is already supported by IT but requires an HR Trust Policy for wider implementation.

The table below when used with the larger table in Appendix A represents where we believe we are currently in terms of embedding carbon management across the Trust.

POLICY	RESPONSIBILITY	DATA MANAGEMENT	COMMUNICATION & TRAINING	FINANCE & INVESTMENT	PROCUREMENT	MONITORING & EVALUATION
1 No policy No Climate Change reference	2 CM is part time responsibility of an individual Some energy champions but no departmental champions	3 Collation of CO <sub>2</sub> emissions for limited scope i.e. buildings only	1 No communication or training	3 Ad hoc financing for CM related projects	1 No green consideration No life cycle costing	2 Ad hoc reviews of CM actions and progress

We aspire to achieve levels 4 and 5 on the matrix, (1 = worst 5 = best), and our CMP will reflect how we will achieve this.

There is a great short film by the British Medical Journal on NHS & Climate Change, which describes the impact of climate change on health and examples of how staff can contribute in lowering carbon emissions.

<http://www.bmj.com/site/video/climate.xhtml>

## 6.5 Policy and Procedure Alignment

In ensuring that carbon reduction is embedded throughout the management of the Trust, rather than create a host of new policies, procedures, meetings and governance processes, it is intended to examine and adapt what is already in place:

### Procurement of goods and services

Through our buying power we can ensure that our suppliers take carbon reduction and sustainability seriously. We therefore propose produce a “Sustainable Procurement Action Plan” including the following actions:

- Develop a “Sustainable Procurement Policy”
- Develop a “Whole Life Costing” tool to ensure that energy, carbon and other environmental costs are properly considered by the Trust in significant buying decisions.



- Review current ordering practices, patterns and habits to improve the efficiency of the supply chain including reducing the production of waste.
- Produce guidance to ensure that those that have devolved responsibility for procurement are adequately briefed on the Trust's sustainable procurement objectives.

### Capital development

With the investment the Trust is committing to improve the energy performance of its existing buildings, it is essential that we don't miss out on opportunities for improvements when carrying out larger projects such as refurbishments or new builds. We therefore need to ensure that we incorporate our sustainable aspirations in design briefs. There are already set requirements for NHS building design (BREEAM), and the Building Regulations also contain a requirement for the conservation of fuel and power. However, these requirements do not cover all construction activities and do not always go as far as is possible.

We therefore propose to produce a "Sustainable Building Design and Construction Policy" which can be applied to all construction projects, no matter how small. This will also include guidance on the standardisation of equipment.

### Business planning and business cases

The impact on energy use and carbon emissions is not always the first consideration when making clinical or business activity decisions. It is acknowledged that patient care should and will always take precedence. However, information on the carbon impact should be considered and mitigated wherever possible as part of our business planning process such as corporate strategies and business cases.

For example:

- the energy cost of running additional theatre sessions or clinics during weekday evenings, or, opening up the department/building at the weekend
- considering the comparative energy and "whole life costs" of replacing a piece of medical equipment when you have more than one choice
- the location of a patient service and the impact on transport

It is therefore proposed that business cases will incorporate a section to cover the cost of energy and carbon emissions.

Furthermore, there are 2 key procurement groups that will be asked to consider the carbon and energy impact when taking decisions:

- "Product Selection Group"
- "Medical Devices Equipment Group"

### 3Ts Development

Regular meetings are taking place between the 3Ts development team and the Trust to ensure that policies and procedures that are related to carbon and energy use are considered and incorporated into the proposals contained within this Plan.



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## 7.0 Programme Management of the CM Programme

### 7.1 Strategic ownership and oversight

The Carbon Management Group will continue to meet monthly to review progress and consider future opportunities. Every project that comes out of the Group will be supported by a business case. However, rather than set up another governance route, it is proposed that projects will be tracked through the existing Project Management Office (PMO) arrangement.

PMO already has regular meetings in place for the range across most departments, and carbon management sits comfortably with the objectives of PMO i.e. a reduction in carbon emissions also equates to financial savings.

### 7.2 The Carbon Management Team

Project Sponsor: Duane Passman (Director of 3Ts, Estates and Facilities)  
Project Lead: Simon Meredith (Head of Property Management Services)  
Sustainability Manager: To be confirmed

In the event of the Project Sponsor, Project Leader or Sustainability becoming unavailable, responsibilities will pass to their respective deputies. The Project Leader will collaborate closely with senior members of the Estates and Facilities team, to ensure that activities and projects can be taken forward without undue difficulties in the event of unavailability of key personnel at any time.

The Carbon Management Team calls upon representation from across the organisation including Estates, Facilities, Finance, Communications, IT, SSD, Pharmacy, HR etc. A full list of members can be found in Appendix C.

The Project Lead chairs monthly meetings of the Carbon Management “Core” Team to review progress on activities and projects, and, to identify any “blockages” that need to be resolved. There is also an open invitation to everyone from the “Reference Group”, with individual requests for attendance or separate meetings when discussing opportunities for those specific areas.

The Project Sponsor reports directly to the Board of Directors.

### 7.3 The case for a full time Sustainability Manager

As previously described, we are now entering the implementation stage and this is where the real work begins. The push towards good carbon management and sustainability demands a lot of time and effort. We began to obtain quotes for consultant support, however it soon became apparent that money would be better spent in appointing a full time Sustainability Manager whose sole remit will be to ensure the effective delivery of the Plan and to maintain momentum thereafter. The outline job description would be as follows:

- To take a lead role in the implementation, management and delivery of the Carbon Management Plan and associated projects.
- Engage with and support all Trust departments to help identify and deliver further opportunities for carbon reduction and cost saving.
- Manage the energy and carbon awareness campaign
- Align Trust policies to incorporate carbon management & sustainability



- 
- Incorporate sustainability into induction and training
  - Develop and manage a Trust sustainable/environmental web-site
  - Monitor and report on progress

The Band 7 salary would be more than covered by the projected savings from an awareness campaign alone.

## 7.4 Reporting on progress

It is important to regularly provide progress reports, not only to the Board of Directors and Finance, but to staff, our contractors and suppliers, patients, visitors and the general public.

- Progress reports on individual projects will be provided every 2 weeks to PMO.
- The Project Lead will report to PMO every month with an update on overall progress of the Carbon Management Plan.
- Updates on carbon reduction will be made available to staff and the general public through the Trust's website.
- Departmental energy use will be available to staff through the "Meterweb" application.
- The Project Lead will continue to regularly update the Project Sponsor who will in-turn update the Management Board and Board of Directors.
- An annual report will be provided to the Board of Directors highlighting progress against target, including not only carbon and financial savings, but also the less quantifiable benefits such as influencing: public travel habits, staff engagement, supplier green credentials, benchmarking against other Trust's and other wider impacts within the local community.

## Appendix A: Carbon Management Matrix - Embedding

	POLICY	RESPONSIBILITY	DATA MANAGEMENT	COMMUNICATION & TRAINING	FINANCE & INVESTMENT	PROCUREMENT	MONITORING & EVALUATION
5 <b>BEST</b>	<ul style="list-style-type: none"> <li>SMART Targets signed off by Board</li> <li>Carbon reduction target fully costed and underpinned by quantified projects</li> <li>Action plan contains clear goals &amp; regular progress reviews</li> </ul>	<ul style="list-style-type: none"> <li>CM is <b>full-time</b> responsibility of a <b>few</b> people</li> <li>CM integrated in responsibilities of <b>senior</b> managers</li> <li>Chief Exec support</li> <li>Involvement of clinicians</li> <li>Part of <b>all</b> job descriptions</li> </ul>	<ul style="list-style-type: none"> <li><b>Quarterly</b> or better collation of CO<sub>2</sub> emissions for scope 1 and 2</li> <li>Systems being set up for scope 3</li> <li>Data <b>externally</b> verified</li> <li>M&amp;T in place for: <ul style="list-style-type: none"> <li>Buildings</li> <li>Waste</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Key staff given formalised CM: <ul style="list-style-type: none"> <li>Induction and training</li> <li>Incentives</li> <li>Communications</li> </ul> </li> <li>CM matters <b>regularly</b> communicated to: <ul style="list-style-type: none"> <li>Full internal and external community, including patients</li> <li>Key partners</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li><b>Granular &amp; effective</b> financing mechanisms for CM projects</li> <li><b>Finance representation on CM Team</b></li> <li><b>Whole life costing</b> embedded into procedures</li> <li><b>Ring-fenced fund</b> for carbon reduction initiatives</li> </ul>	<ul style="list-style-type: none"> <li><b>Senior</b> purchasers consult &amp; adhere to sustainable procurement policy (e.g. PASA or Forum for the Future guidance)</li> <li>Sustainability integrated in <b>tendering &amp; evaluation</b> criteria</li> <li>Whole life costing</li> <li>Collaborative procurement</li> </ul>	<ul style="list-style-type: none"> <li>Senior management review CM process</li> <li>Core team regularly reviews CM progress and target</li> <li>Plan and progress reports publicly available</li> <li>Visible board level review</li> </ul>
4	<ul style="list-style-type: none"> <li>SMART Targets <b>developed and quantified</b> but not implemented</li> </ul>	<ul style="list-style-type: none"> <li>CM is <b>full-time</b> responsibility of an <b>individual</b></li> <li>CM integrated in to responsibilities of department <b>managers</b>, not all staff</li> </ul>	<ul style="list-style-type: none"> <li><b>Annual</b> collation of CO<sub>2</sub> emissions for: <ul style="list-style-type: none"> <li>Buildings</li> <li>Transport</li> <li>waste</li> </ul> </li> <li>Data <b>internally</b> reviewed</li> </ul>	<ul style="list-style-type: none"> <li>All staff given CM: <ul style="list-style-type: none"> <li><b>Induction</b></li> <li>Communications</li> </ul> </li> <li>CM communicated to: <ul style="list-style-type: none"> <li>External community</li> <li>Key partners</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Regular financing for CM projects</li> <li>Cost estimate complete for most projects</li> <li><b>Some</b> external financing</li> </ul>	<ul style="list-style-type: none"> <li>Environmental demands incorporated in tendering</li> <li>Familiarity with OGC and other best practice</li> <li><b>Whole life costing</b> for all major purchases</li> </ul>	<ul style="list-style-type: none"> <li><b>Core</b> team <b>regularly</b> reviews CM progress: <ul style="list-style-type: none"> <li>Actions</li> <li>Profile &amp; Targets</li> <li>New opportunities quantification</li> </ul> </li> </ul>
3	<ul style="list-style-type: none"> <li><b>Draft</b> policy</li> <li>Climate Change <b>reference</b></li> <li>Carbon target set but not quantified</li> </ul>	<ul style="list-style-type: none"> <li>CM is <b>part-time</b> responsibility of a <b>few</b> people</li> <li>CM responsibility mainly within Estates</li> </ul>	<ul style="list-style-type: none"> <li><b>Collation</b> of CO<sub>2</sub> emissions for limited scope i.e. buildings only</li> </ul>	<ul style="list-style-type: none"> <li><b>Environmental / energy</b> group(s) give ad hoc: <ul style="list-style-type: none"> <li>Training</li> <li>Communications</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li><b>Ad hoc</b> financing for CM projects</li> <li>Limited task management</li> <li>No allocated resource</li> </ul>	<ul style="list-style-type: none"> <li><b>Whole life</b> costing occasionally employed</li> <li>Some <b>pooling</b> of environmental expertise</li> </ul>	<ul style="list-style-type: none"> <li>CM team review aspects including: <ul style="list-style-type: none"> <li>Policies / Strategies</li> <li>Targets</li> <li>Action Plans</li> </ul> </li> </ul>
2	<ul style="list-style-type: none"> <li>No policy or target</li> <li>Carbon reduction <b>aspiration</b></li> </ul>	<ul style="list-style-type: none"> <li>CM is <b>part-time</b> responsibility of an <b>individual</b></li> <li>No departmental champions</li> </ul>	<ul style="list-style-type: none"> <li><b>No</b> CO<sub>2</sub> emissions data compiled</li> <li>Energy data compiled on a regular basis</li> </ul>	<ul style="list-style-type: none"> <li>Regular poster/awareness campaigns</li> <li><b>Staff</b> given ad hoc CM: <ul style="list-style-type: none"> <li>Communications</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Some idea of investment needed to reach target</li> <li>Limited task coordination <b>resources</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Green</b> criteria occasionally considered</li> <li>Products considered in <b>isolation</b></li> </ul>	<ul style="list-style-type: none"> <li>Ad hoc reviews of CM actions progress</li> </ul>
1 <b>Worst</b>	<ul style="list-style-type: none"> <li>No policy</li> <li><b>No</b> climate or carbon reference</li> </ul>	<ul style="list-style-type: none"> <li>No CM responsibility designation</li> </ul>	<ul style="list-style-type: none"> <li>CO<sub>2</sub> emissions not measured</li> <li>Estimated billing</li> </ul>	<ul style="list-style-type: none"> <li>No communication or training</li> </ul>	<ul style="list-style-type: none"> <li>No internal financing or funding for CM related projects</li> </ul>	<ul style="list-style-type: none"> <li>No Green consideration</li> <li>No life cycle costing</li> </ul>	<ul style="list-style-type: none"> <li>No CM monitoring</li> </ul>



## Appendix B: 3Ts Carbon Management Proposals

The 3Ts development will achieve a BREEAM Healthcare rating of 'Excellent'. In order to achieve this result the development will achieve an Energy Performance Certificate (EPC) of 'B' and the building energy performance will be in accordance with 2010 Building Regulations, Part L. Furthermore, as a planning requirement of Brighton and Hove City Council, the development will achieve 60% of the available credits in the energy and water sections of the BREEAM assessment.

In order to develop the energy strategy a comprehensive programme of energy simulation modelling is being undertaken. This simulation exercise will achieve the best balance between air circulation, daylight, solar gain and occupant comfort in order to deliver a low energy solution. High performance facades will be employed in order to most effectively balance thermal performance and daylight in order to deliver this low energy solution.

A high efficiency natural gas fired tri-generation Combined Cooling, Heating and Power (CCHP) solution will be employed to supply energy incorporating CHP and absorption cooling from waste heat. This will meet a significant proportional of the annual electricity, heating and cooling requirement for the development. Additionally, investigations are underway as to whether any waste heat could be exported to the existing estate to reduce energy consumption, and thus carbon emissions, of these areas.

Studies have been undertaken as to the applicability of incorporating PV panels on to the new building and, at present, there are roof areas suitable for the inclusion of this technology. Other renewable energy technologies such as wind, Ground Source Heat Pumps, solar thermal and large-scale biomass/bio-diesel were considered and discounted as inappropriate for the site. For example, large-scale wind is inappropriate owing to the urban nature of the site; large-scale biomass/bio-diesel were discounted owing to storage space and delivery issues; and solar thermal discounted owing to the CCHP providing a significant proportion of the annual hot water load.

Reductions in energy demand will be achieved in a number of ways. Lighting systems will incorporate low energy fittings linked to PIR and daylight sensing controls where appropriate. Lighting systems will also operate on zoned controls such that they can operate to best reflect the usage patterns of the zones. Investigations are also underway as to where LED lighting systems may be appropriate.

In common with lighting systems, heating and cooling systems will also be zoned and metered to reflect the operational and occupational patterns of certain areas. This zoning approach will ensure that when areas are unused, lighting, heating and cooling energy consumption will be reduced.

The development is targeting an energy consumption of 45-50GJ/100m<sup>3</sup>. It should be noted that this figure is indicative and is subject to the inclusion or exclusion of equipment energy loads. Comparisons between hospitals are problematic owing to inconsistencies of the reported performance figures for other hospitals in respect of the reporting of equipment loads. However, it is envisaged that the hospital will compare favourably. The 2009 draft Estates Strategy targets NHS '1<sup>st</sup> percentile' performance and improvements for the whole hospital.

In addition, a comprehensive study is being undertaken as to drive towards an aggressive energy target range for the in-use phase of the development so that in-use energy consumption can be effectively planned and managed. The work will inform the decisions made during the Design, Procurement, Construction and In-use phases so that the impact of them can be referenced to the agreed energy target range. The work will involve informing the basis of design with In-use data not normally available to a design team. The work will also enable the team to plan the design of the engineering systems to reflect the planned usage of the facilities. Life-cycle cost planning and user participation is central to this work.

A large living roof is included within the landscaping scheme. This roof will be accessible to patients, staff and visitors. The planting scheme employed will, where practical, be developed so as to require minimal levels of artificial irrigation so as to reduce water use whilst providing additional ecological



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value in an area where currently little habitat exists. Additionally, the landscape strategy forms part of a planning strategy to reduce the Urban Heat Island (UHI) effect in the area.

Rainwater harvesting and grey water recycling studies are currently being undertaken to understand the potential for incorporating these technologies within the development.

Water demand will be reduced by the inclusion of sensor controlled and water efficient taps and WCs. Equipment will also be specified such that water use is minimised. Water metering will be employed to monitor water use over time. Further, a study is being considered to develop a water management strategy that would enable the hospital management team to achieve in use water reductions. As with the In-use Energy Management plan a target range will be established and monitored.

The development will be progressed with the extensive use of modular, prefabricated components so as to reduce construction waste. The contractor aims to achieve best practice in the limiting and management of construction waste. The incorporation of recycled materials in concrete and cement will also be considered where feasible. The contractor also aims to achieve exemplary performance under the Considerate Contractor Scheme.

In addition, a comprehensive audit will be carried out of the buildings to be demolished such that the maximum material value can be recovered from these buildings. Where appropriate, demolition arisings will be accommodated into the new development. The new development will incorporate a comprehensive operational recycling system to enable waste separation and storage.

Materials will, where feasible, be specified so as to increase the level of recycled and Green Guide to Specification A+ rated materials within the development. Discussions are ongoing as to how the most efficient electrical equipment can be specified and sourced.

A comprehensive green travel plan will be implemented for the development incorporating excellent access to the public transport network and convenient, secure cycle parking and associated facilities.

Finally, an energy efficient Procurement Strategy is being developed to ensure choices about the purchases of equipment both for 3Ts and generally are made taking into consideration their energy performance as a selection criteria.

**BDP/Laing O'Rourke 18/01/2011**



## Appendix C: The Carbon Management Team

ROLE	NAME	POSITION
<b>CORE TEAM</b>		
Project Sponsor	Duane Passman	Director of 3Ts, Estates and Facilities
Project Lead	Simon Meredith	Head of Property Management Services
Carbon Trust Programme Advisor	Cate Lamb	Senior Environment Consultant Sinclair Knight Merz
Project Manager	(TBC)	Sustainability Manager
Energy (& Deputy Project Lead)	Dawn Moss	Energy & Information Manager
Project Administration	Joyce McKenzie	Secretary
Estates	Des Weeden	Assistant Director of Estates
Facilities	Mervyn Shilliday Martin McLachlan	Assistant Director of Facilities Head of Environment Support Services
Transport	Shaun Innes	Head of Transport
Procurement	Melvyn Lake	Deputy Head Procurement & Supplies
IT	Gary Steen Bhavna Sapat	Assistant Director off Health Informatics IT Manager
HR	Linda Hallett	Head of People & Development Service
Communications	Rachel Clinton	Head of Communications
<b>REFERENCE GROUP</b>		
3Ts Design Team	Steve Runicles	BDP Environmental Engineering Director
Facilities & Estates (& Deputy Project Sponsor)	Steve Gallagher	Operational Director, Estates and Facilities
Finance	Jonathan Reid Chris Sethi	Head of Financial Operations Chief Management Accountant
Pathology	Phil Brown	Pathology Services Manager
SSD	Ian Finlayson	Decontamination Manager
PFI Management RACH	Barry Kearton	PFI Estates Manager
Waste	Carl Charles	Environment Support Services Manager
Pharmacy	Duncan Livingstone Suzanne Morgan	Locality Manager Pharmacy Procurement Manager
Capital Development	David Saunders	Deputy Head of Capital Development
Division of Medicine	Bini McCall	Matron
Division of Specialised Services	(TBC)	
Division of Surgery	(TBC)	
Division of Women & Children	(TBC)	
A non-executive with a special interest in carbon management	(TBC)	
Union or Trust Council representation	Anthony Phippard	Union Representative on Trust Council
A patient or service user representative	(TBC)	
South Downs Health NHS Trust	Will Clark	Sustainability Manager