From placing sustainability at the core of healthcare provision to becoming the UK's "greenest" hospital

A courageous, challenging and rewarding five year journey

The commitment to sustainability principles by its board and development of an ambitious Carbon Management Programme (implemented from 2008 onwards) has enabled University Hospital of South Manchester NHS Foundation Trust (UHSM) to mitigate the effects of rising fuel prices, limit energy cost increases, engage positively with its wider community on sustainability issues and reinvest funds in providing improved frontline patient services.

Initiatives completed to date have resulted in the Trust significantly improving operating efficiency and reducing carbon emissions by 26% - saving over 6,000 tonnes of CO2e per annum and saving in excess of £400,000 per annum on fuel bills which has been reinvested in frontline patient services to further benefit the community served by the Trust.

UHSM is today acknowledged as Britain's Greenest Hospital and has more recently been recognised by the United States Green Building Council as the 18th most environmentally friendly hospital in the world (the best ranking achieved by any European hospital).

THE CHALLENGE

University Hospital of South Manchester NHS Foundation Trust (UHSM) recognises that energy consumption is necessary for the provision of health care services, but also realises that it has a responsibility to minimise and reduce energy consumption and costs in order to adequately discharge its statutory and mandatory obligations. To complement this, the Trust's Board Approved Environmental & Energy Policy commits the Trust to 'reducing the impact to the environment from its activities.

As the global demand for fossil fuels outstrips supply and governments around the world attempt to reduce anthropogenic effects on climate change, the moral and financial imperatives for NHS organisations to take a leading role in carbon management are greater than ever.
The Climate Change Act 2008 legally binds the UK to cut our greenhouse gas emissions by 80% by 2050, against a 1990 baseline, and by 34% by 2020, against the same 1990 baseline.
The NHS in England has further set a target of reducing its 2007/08 carbon footprint by 10% by 2015 and consequently energy consumption reduction and energy performance improvement remain extremely important within the NHS.

COMMITMENT TO CARBON REDUCTION

In March 2008, the then Board of Directors approved an ambitious Carbon Management Implementation Plan (CMIP) which put in place a robust strategy to significantly reduce carbon emissions associated with UHSM's consumption of energy. By encouraging good carbon management the Trust was taking positive steps to mitigate the effects of rising fuel prices and to limit energy cost increases.

The plan also assists the Trust in our aspirations to be an excellent 'corporate citizen'.

To begin with work was undertaken to identify and quantify the source of our emissions and then explore what solutions could be implemented to enable the Trust to take positive action while ensuring patient services were not adversely affected.

COMMUNICATION

To be effective required the active involvement of people from across the Trust and so a number of communication channels were opened to encourage input from all. This included the forming of a Carbon Management Team to drive ideas and suggestions of how to cut carbon and turn them into a reality. A suite of both internal and external communications was developed that has been essential during the whole journey in ensuring that patients, staff and visitors were being kept informed and remained involved and engaged.

Excellent staff awareness, driven by an army of 'Energy Champions' encouraging colleagues to use energy efficiently has proven to be just as effective at saving energy as some of the latest technologies.

COST EFFECTIVENESS

The carbon management plan identified a wide range of projects to be implemented at a total cost in excess of £3,000,000. This was funded over the lifetime of the plan with a mixture of Trust budgets and approximately £1.55m funding from the Department of Health Energy Efficiency Fund.
The initiatives that have been completed to date have resulted in the Trust significantly improving efficiency and reducing carbon emissions by 26% - saving over 6,000tonnes of CO2e per annum and saving in excess of £400,000 per annum.

INNOVATION, DIVERSE TECHNOLOGIES, PRODUCT SELECTION AND PARTNERSHIPS

Many of the identified opportunities centred on not only on reducing the hospital's significant heat demand but also on decarbonising the remainder. A programme of improving building fabric was instigated which has seen glazing and insulation dramatically improved across the site which has reduced the overall heating base load.
UHSM then undertook an ambitious scheme of installing Steam Raising Biomass Boilers in place of gas boilers – a first for a UK Hospital. All of the biomass fuel used is

sourced from sustainable sources within 60 miles of the hospital which ensures any negative environmental impact is kept to a minimum. This technology alone has reduced our annual CO2e by over 3,500 tonnes.

The 4MW capacity of the biomass boilers was sized to cover the hospitals base load and as a major Acute Hospital it is important for the Trust to have resilience. Therefore, the auxiliary gas fired steam raising boilers were fitted with economisers and modulators ensuring maximum benefit is obtained from the biomass boilers and when gas is needed to be used it is being done so as efficiently as possible. Further work was undertaken to make more efficient use of the heating which included the introduction of building energy management systems, localised controls and regular steam trap surveys.

Improvements in the overall electrical efficiency of the site have also been realised through a number of schemes undertaken as a result of the Carbon Management Plan. Similar to the approach used for heating, these have improved how electricity is delivered and how electricity is used. Technologies have been implemented to eliminate the inefficiencies associated with both. This has included voltage optimisation technology, widespread installation of variable speed drives and a rolling programme of lighting improvements utilising LED technology along with energy efficient lighting controls such as photocells and passive infra-red sensors.

More recently, the Trust has been successful in attaining further funding from the Department of Health to install a number of 'Super Low Loss Amorphous High Voltage Transformers'. This new technology enables the Trust to realise further savings in the delivery of electricity to the site while also giving an increased control over the voltage delivered. The 7x Super Low Loss Amorphous Transformers recently installed will realise a saving of roughly 1 million kWh each year. Added benefits include reduced electrical stress on equipment which will in turn extend the lifespan and reduce maintenance costs.

Along with the 4MW Biomass Boilers, the Trust has utilised a wide range of renewable technologies including a 220kWt Biomass Boiler, Air source heat pumps, ground source heat pumps and 2 different Solar Photovoltaic Arrays with a combined capacity of 88kWp.

ACHIEVEMENTS AND LOOKING AHEAD

The hospital's combination of new technology, energy saving measures and behaviour change activities are a shining example of a logical approach to retrofit that's eminently replicable across the NHS. Implementing its ambitious Carbon Management Programme has enabled the Trust to take positive steps to mitigate the effects of rising fuel prices and to limit energy cost increases. The initiatives completed to date have improved the Trusts operating efficiency and helped reduce its carbon emissions by 26%, cutting over 6,000tonnes of CO2e and saving in excess of £400,000 per annum on fuel. The cost savings achieved have been reinvested in frontline patient services to further benefit the community served by the Trust.

UHSM has been fortunate enough to be recognised for the achievements throughout the journey, winning the Guardian's Public Sector Sustainability Award and the Ashden Award in 2012. The Trust was also the highest placed Acute NHS Hospital in the Governments final CRC Performance League Table, placing it amongst the top 4% of UK organisations. UHSM has also been recognised as Britain's Greenest Hospital and more recently recognised as the world's 18th most environmentally friendly hospital by the United States Green Building Council.

This recognition assists the Trust to spread the message, share best practice with other NHS organisations and encourage further innovation to realise further carbon savings.

Following the success of the plan, the Trust Board has recently approved the next Carbon Management Plan which aims to build on the successes already achieved, further improve efficiencies, reduce emissions and improve overall sustainability of the service.