

# Partnership approach can pay dividends

While healthcare estates and facilities teams NHS-wide are acutely aware of the need to reduce their facilities' carbon footprint, obtaining the necessary funding to undertake the substantial improvements to buildings, plant, and equipment, that may, in many cases, be essential to achieving this goal, will remain a challenge for many Trusts for some time to come. Nevertheless, the Government has underlined its intention to support the NHS's carbon reduction efforts, having in late January announced a £50 million capital fund for 2013-2014 'to fund new and innovative projects to improve energy efficiency and reduce the carbon footprint of the NHS'. *HEJ* reports on this, and a number of other potential funding streams available, to help NHS organisations contribute to the wider carbon-cutting agenda, and examines how bodies such as the Carbon and Energy Fund, and the Carbon Trust, can help both with funding, and via advice and technical support.

In a letter to all NHS Chief Executives, finance directors, and estates and facilities directors, on 23 January this year, deputy NHS chief executive, David Flory, explained that Parliamentary Under Secretary of State for Health, Dr Dan Poulter MP, had announced a plan to establish a £50 m capital fund in 2013-2014, 'to improve energy efficiency across the NHS, supporting organisations to further achieve energy and carbon reductions as set out in the NHS Carbon Reduction Strategy for England (CRS)'.

David Flory's letter pointed out that, with 6,886 hectares of land, and 28 million m<sup>2</sup> of floor space, the NHS in England has one of Europe's largest estates, while in 2011-2012, the energy it consumed cost a reported £583 million. The letter said: "This makes energy consumption a major consideration for NHS organisations in terms of budgetary availability when focusing on additional cost for frontline patient services." The letter added that the NHS Carbon Reduction Strategy for England (CRS) 2009 had 'set an ambition for the NHS to help drive change towards a low carbon strategy'.

## 'Clear gap' highlighted

From David Flory's letter, and the clear picture of the 'gap' between the carbon and energy reductions the NHS is currently achieving, and those it will need to achieve to meet the Climate Change Act targets for 2015 and 2020, that emerged when the NHS SDU published its consultation document, 'Sustainable Development Strategy for the Health,



*An artist's impression of how the Guy's Tower, seen left, close to London's new The Shard, will look on the completion, later this year, of a project to re-clad it.*

Public Health and Social Care System' (for 2014-2020) (*HEJ* – March 2013) on 29 January this year, there is no doubt that NHS healthcare facilities will need to significantly step up their carbon reduction efforts. But what help is available from the Government and other sources?

## Applying for a share of £50 million fund

David Flory's letter explained that the application process for a 'share' of the £50 m NHS capital investment fund would be published on the DH website (It is now accessible at: [www.gov.uk/government/publications/call-for-expressions-of-](http://www.gov.uk/government/publications/call-for-expressions-of-interest-for-funding-to-improve-energy-efficiency-in-the-nhs)

[interest-for-funding-to-improve-energy-efficiency-in-the-nhs](http://www.gov.uk/government/publications/call-for-expressions-of-interest-for-funding-to-improve-energy-efficiency-in-the-nhs)). The letter also set out a timetable, under which, by July this year, 'the evidence and information gathering' phase of the projects was due to be under way, with the various schemes targeted for completion by 31 March 2014.

## Initial evidence and findings

The timetable stipulates that, by 30 August 2014, participating NHS Trusts should have reported on their project to the DH, after which the Department says it will look at scheduling some 'initial evidence and findings' from the schemes. By March 2015, the Department should have published national best practice

Courtesy of Guy's and St Thomas' NHS Foundation Trust

## Carbon and energy reduction

guidance 'derived from the evidence and findings of the energy efficiency schemes'.

In addition to seeking funding for carbon and energy reduction schemes, many NHS Trusts, and indeed private healthcare providers, will be seeking independent advice on, for example, some of the key technologies that could help them reduce their energy consumption, carbon footprint, and energy bills.

### Carbon Trust work

One organisation well placed to offer such advice and guidance, and to help identify potential funding streams, is the Carbon Trust, which, since its establishment in 2001, has worked with a broad spectrum of public and private sector organisations, reportedly saving them some £4.5 bn in energy costs overall, and cutting their carbon emissions by 47 Mt.

### Public sector targeted

One major Carbon Trust target area is the public sector; its 'technical and change support' has reportedly helped over 3,000 public sector organisations cut their energy bills by over £600 m, while reducing their carbon emissions by over 17 m tonnes over project lifetimes. Each year the Carbon Trust runs collaborative programmes for the public sector, and, in 2011-2012 alone, worked with 94 large public sector bodies on carbon management programmes, 'identifying nearly 300,000 tonnes of CO<sub>2</sub> savings, and achieving energy cost reductions of £56 m a year'. The Trust says its CPD-accredited collaborative programmes 'bring together a number of public sector bodies, taking them through a proven set of steps to help them reduce their carbon emissions and energy bills'.

### Technical support to 'de-risk' carbon reduction

The Carbon Trust can provide technical assistance with carbon reduction and energy efficiency projects from independent and experienced Trust engineers, among whose broad range of services is to help customer organisations calculate their carbon baseline, and quantify and prioritise carbon reduction projects.

### Low carbon behaviour change

The newest Carbon Trust programme 'builds on the latest theory in behaviour change and influencing, to help participants change their organisational culture and engage stakeholders'. The six-month programme will, the Carbon Trust says, 'result in a one- or two-year behaviour change strategy that can save around 10% on carbon emissions and energy bills'. The programme includes free access to the basic version of the Carbon Trust's paid-for 'Empower' employee engagement tool.

Programmes are delivered via



*St Thomas' Hospital in London, founded in 1173, and, since 1871, based at its current site on Westminster Bridge Road, and Guy's Hospital, near London Bridge, established in 1721.*

workshops, webinars, and on-site training. 'Time-saving toolkits, templates, and guidance, are provided, and all participants will have access to ongoing support from a named Carbon Trust project advisor'. In March this year, the Carbon Trust saw the largest number of organisations yet – 140 in all – graduate from its public sector programmes in a single year.

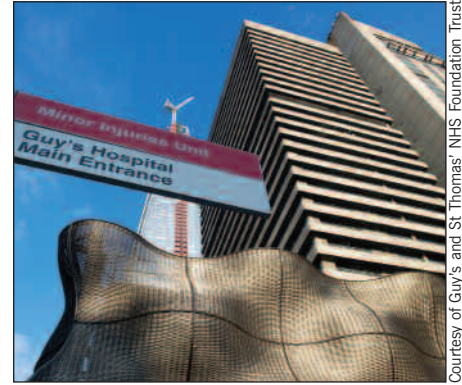
### Carbon footprinting

The Carbon Trust also provides independent carbon footprinting and organisational footprint certification, including via the Carbon Trust Standard, 'a voluntary certification and mark of excellence that enables all organisations to demonstrate their success in cutting their carbon footprint and gain a competitive advantage'. The Trust says: "Achieving the Standard publicly recognises your efforts in reducing carbon emissions, and provides tangible proof to your employees, shareholders, customers, and suppliers, that you are committed to making future reductions. Carbon Trust Certification is widely considered as the world's leading certifier of organisational carbon footprint reduction."

### Achieving the Standard

To achieve the Standard, an organisation must be able to:

- Provide an accurate footprint measurement, including all required emission sources.



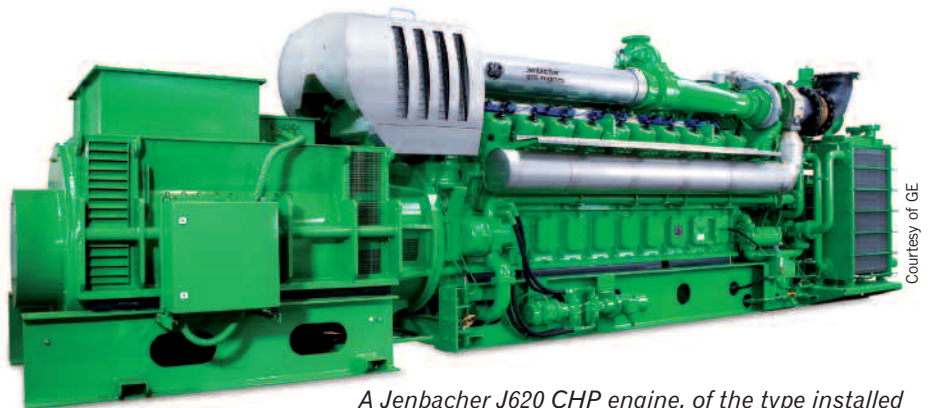
Courtesy of Guy's and St Thomas' NHS Foundation Trust

- Demonstrate an absolute reduction of its footprint, or equivalent relative efficiency improvement.
- Demonstrate good carbon management to the Carbon Trust's standard, including carbon governance, accounting, reduction methods, and targets.

Organisations interested in achieving the Carbon Trust Standard should initially complete the enquiry form, at ([www.carbontrust.com/about-us/contact-us](http://www.carbontrust.com/about-us/contact-us)) or call the Trust, on T: +44 (0)207 832 4655.

### Identifying funding streams

As well as providing technical advice, guidance, footprinting, and certification, the Carbon Trust can also help organisations 'put cost-saving energy efficiency strategies into practice, with leases, loans, finance, and implementation support'. The Trust adds: "We know where energy savings can be made, and how to get energy efficiency strategies up and running. Typically, 20% of a business's annual energy costs are wasted through the use of energy-inefficient equipment. So far we have helped over 35,000 customers introduce £1.6 bn worth of energy-efficient equipment into their businesses, resulting in a £3.7 bn reduction in energy costs. Whether organisations need finance for new equipment, to find high quality suppliers, or to understand how to improve their energy efficiency, we can



*A Jenbacher J620 CHP engine, of the type installed at both the Guy's and St Thomas' hospital sites in 2009.*

Courtesy of GE

provide flexible, impartial, practical help."

Tim Pryce, the Trust's head of Public Sector, adds: "While currently the NHS is probably not doing enough to meet the tough Climate Change Act targets set for 2020, 2025, and 2050, there are some excellent examples of good practice by Trusts, and most now, at the very least, have a good idea of their carbon baseline and footprint."

### Identifying the 'low-hanging fruit'

"If more undertook work to identify, for instance, where boiler or air-conditioning plant may be running unnecessarily, or where steam pipes are leaking, to give just two examples, the NHS could really strongly contribute to cutting overall public sector emissions, giving a lead to other public sector organisations. One of the services we offer is presenting to NHS Trust Boards on the opportunities their organisations actually have to make further carbon and energy savings, and significantly reduce their energy bills."

### Carbon management plans

"To date, we have worked with around 130 NHS Trusts to develop and implement carbon management plans, advising them throughout. Often, Trusts fail to recognise the potential of proven, low-risk projects which could greatly reduce their carbon footprint, and substantially lower their energy bills."

### Guy's and St Thomas'

Guys' and St Thomas' NHS Foundation Trust is a good example of an NHS organisation which has worked closely with the Carbon Trust to significantly reduce its carbon emissions and energy bills. In 2009, the hospital set a goal of reducing its CO<sub>2</sub> emissions by 10% by 2015 – in line with the NHS Sustainable Development Unit's Carbon Reduction Strategy, 'Saving Carbon, Improving Lives'. Thanks, however, to an approach 'combining hi-tech and common sense adjustments' across both its main hospital sites, the Trust has 'avoided' over 40,000 tonnes of carbon emissions since 2009, and reduced its annual energy bills by approximately £2 m.

One of the UK's busiest NHS Foundation Trusts, Guy's and St Thomas' employs around 13,200 staff, and, in 2012/2013, saw and treated 956,000 outpatients, 83,000 inpatients, 74,000 day case patients, and 176,000 A&E attendees, and had 792,000 contacts with patients in



**Tim Pryce, head of Public Sector at the Carbon Trust:**  
*"One of the services we offer is presenting to NHS Trust Boards on the opportunities their organisations actually have to make further carbon and energy savings."*

the community. The Trust operates two large acute hospitals in London, St Thomas' Hospital, founded in 1173, and, since 1871, based at its current site on Westminster Bridge Road, and Guy's Hospital, near London Bridge, established in 1721. It also runs community health services in the London boroughs of Lambeth and Southwark. Its diverse property portfolio includes the world's second tallest hospital building.

### Quick to recognise scope to improve efficiency

According to the Carbon Trust, Guys' and St Thomas' was 'quick to recognise

that steps could be taken to improve the efficiency of its estate'. By 2004, with rising energy bills, it was spending roughly £10 m annually on energy. This, combined with the advent of the CRC Energy Efficiency Scheme, NHS targets to reduce hospitals' overall energy consumption, and the Mayor of London's proposals to make the Capital cut its carbon footprint, provided the incentive to 'strengthen its approach to energy use'.

In 2007 the Trust launched its Earthcare and Environment engagement and awareness campaign, and, over the next 18 months, invested £3 m in energy efficiency projects, including upgrading boilers, insulation, and lighting. In 2009, it installed the NHS's largest combined heat and power

(CHP) capacity, with both the Guy's and St Thomas' sites installing 3 MW Jenbacher J620 CHP engines, supplied by GE Healthcare.

### 'Most significant' project

The Carbon Trust says: "The Trust's most significant project in terms of financial payback has been the installation of the two Jenbacher CHP engines, one at each site." "We looked at alternatives such as wind turbines," explains Alexandra Hammond, the Trust's sustainability manager, "but it quickly became clear that, in terms of both financial, and carbon savings, CHP was the most effective choice."

The Carbon Trust supported Guy's and St Thomas' with feasibility studies carried out by NIFES, which showed that the CHP engines' installation would help the Trust achieve NHS targets. The data was compiled into a business case presented to the Trust's Board in May 2007.

"Fortunately, the Board understands the importance of energy management," explained Alexandra Hammond. "We own our buildings, and plan to be here for a long time, so even on projects where payback isn't instant, it's still worth our while."

### CHP plant's impact

The CHP plant now provides the two hospital sites – Guy's and St Thomas' – with most of their heat and hot water in summer, and approximately half the required heat in winter, as well as covering around half of the Trust's electricity needs. The CHP engines have cut the Trust's annual energy bills by approximately £2 m each year, and reduced its annual carbon footprint by over 11,000 tonnes of CO<sub>2</sub>. As the £10 million



**Alexandra Hammond, sustainability manager at Guy's and St Thomas' NHS Foundation Trust:**  
*"There really is no substitute for staff being involved."*



**Ed Milliband, at the time Secretary of State for Energy and Climate Change, visits St Thomas' Hospital in September 2009 to officially 'open' the new Jenbacher CHP plant there. He is pictured with David Porter, head of engineering at Guy's and St Thomas' NHS Foundation Trust.**

installation was paid for through a grant from the Department of Health's Energy and Sustainability Fund, the Trust has been able to reinvest its savings in its services.

The Carbon Trust says: "Our team of independent energy and environmental consultants helped Guy's and St Thomas' to look at both sites as one project, provide a carbon footprint, review existing activity, and identify potential new measures. The aim was to bring under one umbrella the various plans to reduce carbon emissions in key areas such as procurement, waste, recycling, and buildings." "We would also like to think that the work we have done will help others, as the Carbon Trust promotes and helps with sharing of good practice," says Alexandra Hammond.

### Catering facilities examined

As part of the Carbon Trust's overall review, the efficiency of the Trust's kitchen facilities were also considered – culminating in cooking for the two hospitals now all taking place at St Thomas', with prepared food delivered to Guy's once daily. This means that cooking equipment, which previously ran in tandem at both sites all day, now only operates at one. The Trust has also been able to 'vastly reduce' the refrigeration equipment at Guy's, while catering staff are aiming to upgrade the fridges at the St Thomas' site with more efficient models. This move has also opened up a new revenue stream, since, having gained Safe and Local Supplier Approval (SALSA) accreditation in 2010, the Trust is now able to supply food to other local NHS Trusts.

### Under 'one umbrella'

Alexandra Hammond added: "The work with the Carbon Trust has really helped us cut across divisions, and draw lots of smaller initiatives together under one strategic umbrella into a plan we could present to the Board. The advice we've received has been a useful combination of simple steps implementable now, and long-term measures which, together, will help us achieve tangible cost and carbon savings."



Courtesy of Barts Health NHS Trust



The Barts Health NHS Trust's two large acute hospitals – the 'new' Royal London, which opened in 2012, and St Bartholomew's.

Other energy-saving measures implemented by the Trust have included replacing existing washing machines with 'highly efficient' units that 'require very little water'. Alexandra Hammond said: "Our work has also identified lots of smaller or simple measures. For example, we have also done a lot to improve our lighting – from changing to more energy-efficient bulbs and fittings, to adding various sensors, and looking at the quantity of lighting and hours of use. With around 15 miles of corridors, this formed quite a grand undertaking, but it was worth it." Other activity conducted includes improvements to heating and lighting controls; the extension of existing building management systems to areas not previously covered, and insulation on piping.

### Tower refurbishment project

Another major project for the Trust will be the upgrade to the exterior of the 34-storey Guy's Tower, originally built in 1974. The project, set to conclude later this year, will improve energy efficiency and reduce solar gain – through upgrading of the windows, and the installation of a thermally efficient new surface on part of the building. "We hope to reduce the heat on the South side, as you need masses of air-conditioning to help to regulate the temperature," explains Alexandra Hammond. "At the same time, the North side can be uncomfortably cold, and the new windows will help to keep the temperature comfortable. The Carbon

Management plan was a great way of kicking off efficiency measures. It really mobilised the Trust around efficiency, and we're now seeing the results."

In 2009 Guy's and St Thomas' appointed Alexandra Hammond as sustainability manager, and Joseph Grice as energy manager. "The sustainability manager position was created to make sure everyone is working together, and to continue to encourage this more joined-up approach to efficiency," explains Alexandra Hammond.

The Trust's Earthcare and Environment campaign, which supports over 140 staff volunteers, known as Local Environment Representatives (LERs), is seen as key. "The LERs are our eyes and ears on waste, recycling, water efficiency, and so on," she explains. "There really is no substitute for staff being involved. Patients too for that matter, although obviously we need to be more sensitive about what we can expect from them, but we can offer things like recycling facilities."

### Staff's contribution

She continues: "There are lots of things that staff can do to reduce energy consumption and help lower our carbon footprint, from shutting down printers, to turning off lights. We have about 10,000 PCs in use Trust-wide, and in many cases there is no ownership of them. People tend to 'hot desk', and no-one wants to be responsible for having turned the computer off when someone else needs it urgently. Instead we're looking at having a



Courtesy of Barts Health NHS Trust

Operation TLC has seen 15,000 Barts Health NHS Trust staff encouraged to turn off unused equipment, switch off lights, and close hospital doors. Pictured (left to right) are: Andre Nunes, deputy Nuclear Medicine lead technologist, with an isolator that he identified could be shut down more often when not in use; Emmanuel Patcha, charge nurse, Elderly Orthopaedics; Nigel Rose, senior charge nurse, Paediatric Assessment and Short Stay Unit, with campaign mascot, 'Mr Switch It', and Nahar Khalisadar, senior sister at the Breast Clinic at St Bartholomew's Hospital.

**Table 1: Carbon-saving initiatives undertaken by the Barts and the London NHS Trust (now Barts Health NHS Trust) following the Carbon Trust 2007 Energy Efficiency Review.**

Project description	Investment (£)	Annual savings (£)	Annual CO <sub>2</sub> savings (tonnes)	Payback (months)
Boiler house refurbishment, burner controls, steam traps, insulation, addressing leaks	165,490.00	213,975.00	1,842.00	9.24
Steam trap repair/refurbishment	7,500.00	34,820.00	235.00	2.64
Energy-efficient lighting – Front Block/West Wing/Alex Wing common areas and corridors	62,293.35	28,272.33	14.00	26.40
Variable speed drives/ Economisers	35,000.00	10,412.00	76.00	40.32
AMR	80,000.00	0	0	0
Power optimisation	320,000.00	93,930.00	619.00	40.92
Air conditioning inspection, repairs, and steam leaks	144,400.00	225,848.00	1,354.00	7.68
Chillers	208,000.00	79,157.00	522.00	31.56
Energy-efficient lighting – OPD and OPD annexe common areas and corridors	30,000.00	10,020.95	14.00	35.88
TDS boiler blowdown controls and plate heat exchanger – Royal London Hospital	34,000.00	30,924.00	327.00	13.20
Cycle plant pots	2,990.00	0	0	0
Cycle showers	83,000.00	0	0	0
PC power management software	36,000.00	135,740.00	895.00	3.24
Boiler lagging – flange and valve insulation covers	9,250.00	10,934.00	79.02	10.20
Flue gas economiser	352,000.00	138,248.00	854.00	30.60
<b>Totals</b>	<b>1,569,923.35</b>	<b>1,012,281.28</b>	<b>6,831.02</b>	<b>18.60</b>

centralised shutdown, which would automatically turn the computers to 'hibernation' mode when they're not being used. We are also looking at introducing a 'thin client' programme, removing the need for individual hard drives, and using far less power."

### Automatic meter reading

The Trust is also investing in automatic meter reading, which will help it take its next key step towards recognising where it can further reduce energy; an activity made all the more complex by the nature of the sites. Alexandra Hammond said: "The estate has developed over time, and its systems don't all link up, so it is very hard to measure our energy use. In addition, we have a circular heating system, which is complex to regulate, and to measure where the heat is going. Some areas are already sub-metered, but our next big project is to introduce consistent metering across both sites. The important thing will be to use the information to make a difference."

### Barts and the London

Another Trust to benefit from working with the Carbon Trust, and whose carbon reduction efforts have continued apace in recent years, is the Barts Health NHS Trust (formerly the Barts and The London NHS Trust). As detailed in a case study, 'Energy efficiency opportunities are not a myth', in the green monday report, Energy Efficiency White Paper, published in summer 2011, in 2007 the Barts and The London NHS Trust (the BLT) commissioned the Carbon Trust to review its 'energy efficiency' opportunities. 'On

the back of the opportunities identified in the review', the Trust's Board then created a new role of environmental manager, which Fiona Daly took on. Within two months of arriving, she approached the Board with a 'modest CAPEX request', totalling £15,000, that she promised would be quick to implement, would pay back in under two years, and would be easy to measure

### Over £1 m in annual savings

The Trust has since invested some £1.6 m in around a dozen follow-up initiatives, generating annual savings of over £1 m – a combined payback of 18 months (with the figures externally validated by EC Harris). The measures, and the annual investment, carbon reduction savings, and payback, are shown in Table 1.

### Recent work

Writing about the Barts Health NHS Trust's more recent carbon and energy reduction work for the Trust's 2012-2013 Annual Review, Fiona Daly explained that the Trust – the UK's largest – occupies over 570,000 m<sup>2</sup> of NHS estate at its sites in London, representing 3% of the acute real estate in the NHS, and 1.7% of the estate overall.

### Savings directed back into frontline care

She says: "Improving the efficiency of our built environment, and reducing emissions, have therefore been critical to us achieving both financial and carbon savings. To date we have reduced our emissions by 17%, releasing £2 m, which can be redirected back into frontline

patient care – the equivalent of 94 nurses. This puts the Trust on target to achieve the Climate Change Act reduction of 34% by 2020."

The Trust has an annual energy bill of £12 m, with an additional £2.5 m spent on waste and water. Fiona Daly says: "Our building energy emissions sit just shy of 80,000 tonnes a year – enough to power and heat over 7,000 homes for a year. With the Trust obligated to pay a tax on its carbon emissions, this adds a further £1 million to our utility costs.

### Hosting NHS Sustainability Day

"Over the past year," she continues, "since the former Barts and the London NHS Trust became the Barts Health NHS Trust, we have focused on key elements of carbon and energy reduction across the new organisation." Among the highlights, Fiona Daly says, was hosting this year's NHS Sustainability Day – in which over 100 NHS organisations and private partners across the UK participated, 'creating change and raising awareness'. (HEJ – May 2013).

Across Barts Health itself and its sites a number of activities took place, 'to showcase what can be achieved'. These ranged from children's wards designing recycling stations, to sustainable, locally sourced meals being served in the Trust's restaurants and to patients; showcasing of waste and recycling; demonstration of the use of electrical vehicles to transport goods between sites, and the planting of 30 trees across the organisation. Solar bins were also used, while 'sustainability champions' showcased Operation TLC (see pages 48 and 51 within this article)

actions, and installed draughtproofing to three of the Trust's single-glazed buildings.

### Sustainable waste programme

Fiona Daly adds: "Over the year the Trust has also taken many other carbon-reducing steps, including improving facilities for cyclists, and implementing and delivering an integrated sustainable waste programme; driving compliance, and reducing emissions from road miles by 5,000 tonnes, in turn saving us £300,000 to date. We are also setting ambitious targets to remove all waste from landfill, and increase recovery and recycling rates across all our hospital sites. We currently recover or recycle almost half our waste, and will look to increase this to around 60% over the next three years."

### Opening of the 'new' Royal London

With 2012's opening of the 'new' Royal London Hospital (*HEJ* – May 2012), which has both a significantly larger floor area, and more highly specialised equipment, than its predecessor, the Barts Health NHS Trust has also seen an increase in consumption across all utilities. In response, it has established a 'consortium energy group', which Fiona Daly explains is 'exploring ways in which we can ensure that the facility can be enhanced to make it more energy-efficient'.

She adds: "With rising fuel prices projected to continue, the Trust is also seeking to establish significant investment in energy efficiency measures and infrastructure improvements through an Energy Performance Contract (EPC) model." Fiona Daly says this will enable it to improve the efficiency and resilience of its building stock, while reducing both cost and carbon emissions, ensuring that it achieves the legislative (Climate Change Act) target of a 34% reduction by 2020 (on a 1990 baseline).

### Replicated across the portfolio

"Over the next three years we will continue to invest in our estate," she adds, "and ensure that existing measures are replicated across the whole portfolio. Future investment will be focused on improving infrastructure and resilience, and delivering ambitious carbon reduction savings."

As Fiona Daly said in the 'green monday' White Paper, 'one of the biggest challenges of effective carbon reduction work is getting people to change their behaviour'.

### Changing behaviour

Since last December, in a project which shows what can be achieved, the Barts Health NHS Trust calculates it has reduced its energy bills by £100,000 through a 'behaviour change' project



Courtesy of Barts Health NHS Trust

**A poster used at 'Barts' during NHS Sustainability Day 2013, encouraging staff to come forward with their own energy and carbon reduction ideas.**

dubbed 'Operation TLC', run at its two largest hospitals – St Bartholomew's Hospital, West Smithfield, and the Royal London Hospital in Whitechapel. The 'inspiration', practical support, and funding, came from a public-private/NGO partnership between Barts Health NHS Trust, GE, Skanska, and environmental charity, Global Action Plan. While staff actions started in earnest last December, the 'partnership' had actually been working with the Trust for over a year to plan and design the programme. (Results and estimated savings come from data collected by the partnership based on behavioural audits, patient experience surveys, and energy data, and were independently evaluated by the Clinical Research Centre at Queen Mary University, London).

### Three key actions

Reaching 15,000 Barts Health NHS Trust employees, including nurses, doctors, and support staff, and using 'behaviour change approaches' such as 'highly targeted education efforts, social norming, and staff advocacy', the programme encouraged staff to undertake three key actions – turning off unused equipment, switching off lights, and closing hospital doors. The result was a 40% reduction in lights left on in wards, while ensuring that staff closed 'crucial doors' allowed for better temperature regulation and increased patient safety, privacy, and dignity. Patients in pilot wards also



Courtesy of Barts Health NHS Trust

**Fiona Daly, environmental manager at the Barts Health NHS Trust: "Operation TLC has delivered improved patient care at the core of our business, while empowering our entire workforce to take action on energy usage and climate change."**

reported improved experience through better sleep, reporting a third fewer incidences of sleep disruption, and 25% fewer 'privacy disruptions' than in non-pilot wards.

The Trust has estimated that rolling out the programme across all its six hospitals could save it a further £400,000, while it believes the use of similar 'nudge' techniques across all UK NHS Trusts could save as much as £35 million.

### Payback in under 12 months

Global Action Plan says: "It is forecast that the programme should pay for itself in less than a year, representing a greater ROI than many other energy efficiency investments." Fiona Daly says of the project, meanwhile: "Operation TLC has delivered improved patient care at the core of our business, while empowering our entire workforce to take action on energy usage and climate change. It has been a truly inspiring project, and one I hope other NHS Trusts will be inspired to follow."

### Carbon and Energy Fund

One of the best-known procurement frameworks for NHS Trusts and other public healthcare organisations seeking funding for carbon and energy reduction schemes is the Carbon and Energy Fund (or CEF), a '£300 million + fund' described as 'the natural successor to the NHS Energy and Sustainability Fund', which exists 'to fund and support carbon and energy projects in the NHS that meet a certain level of carbon savings per £1,000 of investment required' (*HEJ* – April 2011).

The CEF explains: "Hospitals presently pay suppliers for energy, and are liable for increasing carbon tax. The payments made are higher than they need be, as much energy is wasted through poor efficiencies of old plant. The CEF offers a 'new for old' strategy that pays for itself through efficiency gains. The CEF aims to provide Trusts with a contract that guarantees an agreed level of savings when compared with their existing energy and carbon liabilities."

### Payments over a fixed term

The CEF continues: "The contract allows for payments over a fixed term (typically 15 years) to a specialist contractor selected from the established NHS framework, with all performance and payments throughout the

term monitored and audited by the Fund. The payments are offset by guaranteed savings, and, in most cases, exceed the costs. The CEF contract is an NHS Specific standardised, but sophisticated energy services performance contract, and is free to members of the CEF. After a short mini-competition and four bids, the project team chooses the best company to work with. The contract the Trust signs will identify the agreed and fixed level of guaranteed savings, and the payment to the contractor, which includes all costs to the Trust, including fees. In return, the contractor will provide the required infrastructure upgrade, and deliver the carbon and energy savings."

### A 'live' example

On its website, the CEF explains that 'the easiest way to understand the economics of a project under the fund is to consider a live example'. This is shown, in some detail, in a table in the section: 'How it (the Fund) works', which summarises the feasibility from a real project, and presents three funding options; see [www.carbonandenergyfund.net/content.php?page=how\\_it\\_works](http://www.carbonandenergyfund.net/content.php?page=how_it_works)

The CEF says in the accompanying text: "Every project using the CEF has the choice of using its own funding, that of the contractor (which includes Salix, grants, or other sources), or that of the CEF. We are delighted if Trusts choose to fund projects themselves, as it leaves more of the Fund capital for projects that don't have other options. Irrespective of funding source, however, the CEF still lets members use its expertise, framework, contract, and payment and audit mechanisms, for their projects."

### Released 'in tranches'

To date projects under the CEF have been released in tranches each approximately 7 to 9 months apart, each starting when the previous tranche goes to contract – which the CEF says represents 'a saving of over a



*Staff from the paediatrics theatres at the Royal London who won an iPad – which they dedicated to the Children's Recovery Area – in an energy reduction campaign run at the hospital during 2012.*

year compared with a standalone OJEU process'. The CEF says: "The reason for having tranches is to ensure that the Fund, and the specialist contractors, can all cope with the increased number of projects in the most efficient way."

Tranches and dates so far have been as follows:

- July 2011 – The funding for the first five participating Trusts was released, followed by two more in October 2011.
- February 2012 – Funding for the second tranche of 10 Trusts was released.
- November 2012 – Funding for the third tranche of projects started to be released.
- July this year – The fourth tranche of funding, which may be used by the Government to also pilot some non-NHS projects, was released.

After tranche 4 there is expected to be a tranche of funding for up to 15 Trusts every 7/9 months 'for as long as there is demand in the NHS'.

### OJEU-compliant process

The CEF funding process is based on the CEF's own OJEU-compliant process, and the steps that need to be completed for a Trust to get a scheme under way are set out on the CEF's website, in the section entitled 'About the Fund', at [www.tinyurl.com/q9zajwe](http://www.tinyurl.com/q9zajwe)

### Practical completion

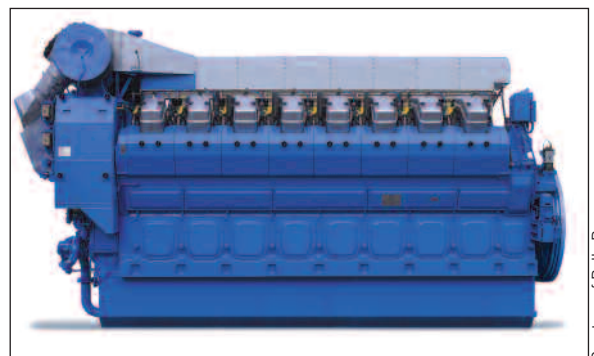
The explanation on the CEF website states: "Only when the installation has been proven to meet standards, and to perform technically and financially, will practical completion be approved, after which the operational phase begins. After practical completion, the Trust will start its payments (the first made to anyone in the project), and the guaranteed savings will start. At the end of the year, based on regularly taken and monitored energy readings, the Fund will review the project over the whole year, and certify the level of savings

generated. If the savings equal, or exceed, the guaranteed savings, then all is well, while, should they fall below the guaranteed level, the contractor will 'write the cheque for the shortfall'. The Fund will also support the Trust in dealing with any contractual or performance issues that arise within the contract term."

### No fees charged

The CEF adds: "The CEF charges no fees. We supply project management, specialised technical, legal, procurement, financial, and balance sheet support, our contract, our framework, and cradle-to-grave project support to members, for free. All we ask is that Trusts only use us if they genuinely wish to upgrade their carbon and energy infrastructure at no net cost to themselves, and that, if they do so, that the contract includes, within its costs, a contribution to our legitimate costs.

"There is no commitment until the Trust Board agrees to appoint a preferred bidder, and all project costs are included within the bid presented to the Trust Board, and covered by guaranteed savings. The Trust needs pay for nothing (apart from a couple of days of legal due-diligence time) until the project is procured, installed, and proven to be generating the guaranteed savings. No other procurement route for the NHS can make this offer."



*MITIE is to develop and operate a new 'sustainable energy innovation centre' for the Addenbrooke's and Rosie hospitals in Cambridge (left). The centre is scheduled to incorporate a 7.5 MW Rolls-Royce Bergen CHP plant (right).*

Clive Natrass, Carbon and Energy Fund CEO, adds, however: "With the second tranche of projects running late, in some cases because the NHS Trusts concerned were very slow at obtaining internal approvals, we have, however, recently introduced a scheme whereby Trusts prepay us a percentage (one-sixth per month) of our costs from Board approval onwards, and we then repay this prepayment on contract closure."



**Clive Natrass, Carbon and Energy Fund CEO.**

### Joining the Fund

Trusts wishing to express interest in joining the fund, or to be added to the Fund update list, should email: [EOI@carbonandenergyfund.net](mailto:EOI@carbonandenergyfund.net). More information is available at: [www.carbonandenergyfund.net](http://www.carbonandenergyfund.net)

### Energy innovation centre a 'landmark' project

One project that clearly demonstrates the benefits of entering into partnership with the Carbon and Energy Fund is taking place at the world-famous Addenbrooke's and Rosie Hospitals, operated by the Cambridge University Hospitals NHS Foundation Trust. In 2010, the CEF initiated, and agreed to manage, the development, procurement, investment, construction, and operation, of a new 'sustainable energy innovation centre' for the Trust. Last May outsourced FM specialist, MITIE, was awarded preferred bidder status to develop the new energy centre, and to operate it over a 25-year contract term, while in March this year it was formally announced that MITIE would develop and operate the facility, which it is expected will save the Trust around £20 m in energy costs, and 25,000 tonnes of CO<sub>2</sub>, annually. Grid electricity and gas consumption will, it is predicted, be reduced by over 50%. The centre will provide low carbon heating, hot water, and electricity, for the Addenbrooke's and Rosie hospitals, and will be designed with the potential to provide energy to future

developments on the Cambridge Biomedical Campus. Aviva Investors, which described the deal as 'a landmark transaction', and the UK Green Investment Bank, will provide approximately £36 m in funding for the centre's development.

### Heat recovery

The existing energy centre currently houses CHP plant that is over 20 years' old. The Trust incinerates clinical waste on site,

using it as a fuel source to provide heat and hot water to the campus.

MITIE explains: "Technology has advanced over the decades, and the new energy centre will utilise a number of different energy-efficient technologies, including a new incinerator, and a highly efficient (7.5 MW) Rolls Royce Bergen CHP plant, which will use sustainable woodchip as fuel source."

Also planned – for installation within a new boilerhouse and incinerator building – is a waste heat recovery generator, with gas firing; a clinical waste incinerator; a biomass system; three dual-fuelled steam-raising boilers; a low temperature hot water system to heat part of the site; a new services tugway; associated piping, plant, flues, and electrics; and, as part of the wider project, installation of variable speed drives and voltage optimisation across the site, and a site-wide lighting upgrade. The new energy innovation centre will deliver 'low-carbon, low-cost' energy to Addenbrooke's from 2015, with the potential to supply further NHS developments planned for the Biomedical Campus."

### Royal Berks invests in renewable energy

In another recent CEF-supported carbon management scheme, Reading's 740-bed Royal Berkshire Hospital has taken delivery of a new Cogenco 2 MWe CHP unit (Cogenco is a Dalkia subsidiary). Restricted space saw the 21 tonne CHP

engine very carefully lowered into the existing boiler room. Dalkia's expert operations and projects team inched the CHP into position using a crane, forklift, winches, and rollers.

Dalkia's 15-year 'design, build, fund, operate, and maintain' contract also includes the supply and installation of a 1 MW Danstoker waste heat boiler, hot water mains, and a plant management system (PMS) to control the energy centre. Hospital services were maintained throughout. Downstream energy management, including installing new lighting, improving insulation, optimisation controls, and heating systems, are also included, with the costs repaid through guaranteed performance savings. High efficiency lighting has been supplied by Ecolite.

### Commissioning tests passed

The CHP and waste heat boiler have passed commissioning tests, and the energy centre will become operational after the hospital completes remedial works to the infrastructure. Dalkia will operate and maintain the centre and associated fittings for 15 years.

Supporting the Trust's 'Carbon Implementation Plan' to reduce its carbon footprint by 25% by 2015, Dalkia says the project will achieve annual energy cost savings of over £920,000, and CO<sub>2</sub> savings of 3,800 tonnes.

Clearly, there are many potential benefits for Trusts embarking on major energy and carbon reduction schemes in enlisting expert outside help. On pages 55 to 58 we feature a selection of interesting case studies focusing on further successful energy and carbon-cutting initiatives by healthcare providers, in conjunction with energy and plant suppliers, whether the organisations have 'gone it alone', or indeed (as detailed in this feature) worked hand-in-hand with another organisation providing funding, and/or technical advice and guidance. +

### References

- 1 Green Monday 'Energy Efficiency White Paper', published Summer 2011. [www.tinyurl.com/macbvwa](http://www.tinyurl.com/macbvwa)



*The existing boiler at the Royal Berkshire Hospital, Reading, being removed, prior to Dalkia's installation of equipment including a new Cogenco 2 MWe CHP unit, incorporating a Cummins engine (centre), and a 1 MW Danstoker waste heat boiler (right).*