Healthcare steam systems

Innovations to improve energy efficiency, reduce risk and cut emissions

White Paper

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1.0 Executive Summary

The UK’s National Health Service (NHS) aims to reduce its CO₂e emissions by 80% by 2050, compared to a 1990 baseline. Substantial reductions have already been made between 1990 and 2013, yet a 28% reduction is still required to align with the Climate Change Act target of a 34% reduction by 2020.

Around 15% of the overall carbon footprint for the NHS and public health services is due to the energy consumed by buildings.

Using steam to provide hot water for space heating and domestic duties such as hand washing and cleaning, as well as for sterilisation services, is a significant contributor to the overall energy bill in the UK healthcare sector.

There is huge potential to save thousands of tonnes of emissions per year through the application of existing and innovative steam system technologies. The investments needed are relatively low and even small-scale projects can reap surprisingly high returns. Examples include replacing conventional hot water calorifiers with the latest compact steam-to-hot-water on demand systems, and improving systems to maximise the return of condensate to the boiler feedtank.

There are many opportunities for improving energy efficiency in steam systems. An excellent starting point is to engage a steam system specialist to review the existing installation, make initial improvement recommendations, then analyse and present them with a full lifecycle cost analysis.

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Healthcare animation showcases steam system benefits to hospitals

The energy-saving and other benefits available to the healthcare sector are brought to life in a fly-through animation.

The 140-second animation takes the viewer on a journey between the boiler house and various steam applications in a typical hospital to reveal how UK hospitals are reducing energy consumption, lowering emissions, minimising risk and ensuring compliance with industry guidelines and standards.

The animation can be viewed at: https://www.youtube.com/watch?v=Z7oDITOF_BE

Use a smartphone or tablet to access the animation using this QR Code:

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The NHS reports its greenhouse gas (GHG) emissions in carbon dioxide equivalent (CO₂e). CO₂e encompasses six GHGs: Carbon dioxide; Hydrofluorocarbons; Methane; Nitrous oxide; Perfluorocarbons; Sulphur hexafluoride. Using CO₂e allows different greenhouse gases to be compared on a like-for-like basis relative to one unit of CO₂.
2.0 The NHS targets its energy consumption

In England alone, NHS buildings consume more than £400 million worth of energy every year\(^1\). That energy accounts for around 15% of the overall carbon footprint for the NHS, public health and all local authority commissioned and provided adult social services in England, which is estimated to be 32 million tonnes of carbon dioxide equivalent (MtCO\(_2\)e) in 2012.

The NHS, public health and social care system has set the goal of reducing carbon dioxide equivalent emissions across building energy use, travel and procurement of goods and services by 34% by 2020. Taking into account the reductions already made between 1990 and 2013, there is still a 28% reduction required to align with the Climate Change Act target of a 34% reduction by 2020\(^2\) and to leave the organisation well placed to meet its 50% reduction target by 2025.

The NHS sees energy efficiency as one of three ways to reduce its energy use to contribute to lowering emissions, energy bills and energy demand. The other two principles are reducing unnecessary usage and increasing the amount of low carbon energy. Reducing its energy use is recognised by the NHS as being important to address fluctuating fuel prices, growing global energy demands, reducing greenhouse gas emissions and ensuring a secure energy supply.

Figure 1: The NHS aims to reduce its CO\(_2\)e emissions by 80% by 2050 (source: “Sustainable, Resilient, Healthy People & Places”, Sustainable Development Unit funded by the NHS)

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1 NHS Carbon Reduction Strategy for England, Saving Carbon, Improving Health, the Sustainable Development Unit funded by the NHS.

2 Module: Carbon Hotspots, the Sustainable Development Unit funded by the NHS.
Healthcare facilities are generally intensive energy users compared with many other buildings, because of their specialised requirements for 24-hour working. Steam is used widely in many hospitals to provide hot water, space heating and sterilisation services. There are good reasons for this. Steam is an efficient and controllable heating medium that is proven to be reliable, safe, flexible and sterile.

Innovation in steam plant control and monitoring technology in recent years provides many new ways for hospitals to substantially improve the efficiency of existing systems to help reduce energy consumption and lower carbon emissions. In 2010, the NHS Sustainable Development Unit published a report\(^3\) which estimated that improving the efficiency of heating plant has the potential to save almost 6,400 tonnes of CO\(_2\) emissions across the NHS in England by 2015.

New-build hospitals are also specifying and installing modern steam systems, underlining how steam has advantages over other heating technologies, such as Medium Temperature Hot Water (MTHW).

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\(^3\) NHS England, Marginal Abatement Cost Curve, February 2010.
Case Study: Energy-saving steam project for €340m new-build hospital

Spirax Sarco delivered a project to provide the steam for heating, hot water, humidification and laundry services at a brand new, €340 million, acute hospital for the Enniskillen Trust in Northern Ireland. Spirax Sarco also provided the controls to manage the steam feeding the hospital’s Combined Heat and Power (CHP) plant.

The company carried out the work after being appointed by Mercury Engineering, which was contracted to provide building services for the new facility. “Spirax Sarco was our preferred supplier because they offer good experience and high quality,” said Gerry O’Donnell, Contract Manager with Mercury Engineering. “They did the steam system design and project management, as well as supplying the equipment, so Spirax Sarco was a one-stop shop for us.”

The hospital runs two biomass boilers, which run at 8 bar g and 30 bar g to drive the hospital’s CHP generation plant. There are also two oil-fired steam boilers running at 8 bar g to generate steam for low-temperature hot water for heating, domestic hot water for hand washing, bathing and cleaning, laundry services and humidification.

As well as providing all the peripheral equipment to support the CHP engine, Spirax Sarco designed, fitted and commissioned a total of 11 plant rooms throughout the 315-bed facility, as well as 27 air handling units, boiler controls, heat exchangers and all the associated equipment to establish an efficient energy distribution system that can be controlled from the hospital’s leading-edge Energy Centre.
3.1 Steam or MTHW?
A research paper published in 2013 by the Chartered Institute of Building Services Engineers (CIBSE) stated that: “The investigation concludes that although steam retains a Victorian image, in hospital applications its energy and financial performance costs are comparable, and sometimes better than hot water alternatives.”

The paper’s findings included several advantages of steam heating systems compared to MTHW systems, such as lower installation and maintenance costs due to smaller pipework and no need for system pumps and balancing valves. The report also says: “Temperatures and in turn pressures are easily controllable in a steam system by way of pressure reducing valves and two port control valves rather than three port valves on the MTHW system.”

The report’s authors also concluded that operation and maintenance are vital to ensure the highest performance of both types of system.

3.2 Clean steam for sterilisation
Hospitals rely on clean steam for sterilising surgical instruments and sometimes for humidification. Clean steam is produced from demineralised or reverse osmosis feedwater by a chemical-free clean steam generator complying with the demanding requirements of HTM (Health Technical Memoranda) covering sterilisation in hospitals. This eliminates the risk of contamination and ensures consistent control of critical steam quality attributes such as dryness, superheat and non-condensable gases, all of which could adversely affect the process and equipment.


3.3 Applying innovation to steam systems
Steam systems are capable of being operated with limited supervision and with high energy efficiency. The latest technological developments such as

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Case study: Modernising boiler controls helps Medway Maritime Hospital save energy

Medway Maritime Hospital has shaved 2 to 3% off its main boiler house energy bill with the installation of two automated systems for boiler blowdown from Spirax Sarco.

The automatic TDS (total dissolved solids) systems monitor the build-up of contamination in the boilers and initiate a boiler blowdown when the level of contaminants reaches a preset threshold. Before the installation of the Spirax Sarco systems, staff at the Kent-based hospital carried out periodic blowdown operations on the two boilers by hand.

“With manual blowdown we didn’t know exactly how often to blow down so we had to err on the side of caution,” said the hospital’s Technical Engineer — Environmental, Phil Belton. This meant that the hospital was discarding more hot water than necessary.

“We identified the blowdown operations as one of the areas in the boiler house that could play a part in our carbon reduction operations. After all, we were spending an average of around £40,000 every month on boiler fuel,” said Mr. Belton. “One other main bonus is the freeing up of manpower, it’s a way of semi-automating the boiler house.”

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4 “Is Steam a Modern Heating Medium or a Victorian Hangover?” Session 14, Paper 3, CIBSE Technical Symposium, John Moores University, Liverpool, 11-12 April 2013.
accurate temperature control, advanced water treatment and sophisticated energy utilisation and recovery ensure that steam meets ever-more demanding energy efficiency requirements.

Steam plant offers unrivalled lifespan with up to 30 years of proven operation being common, for low cost of ownership. Throughout this operational life, automatic monitors and controls continuously check the health of the entire system and free up skilled personnel for other beneficial duties such as proactive maintenance.

A range of innovations can be applied to healthcare steam and condensate systems to improve energy efficiency and lower greenhouse gas emissions. In this section we look at the most cost effective.

3.3.1 Heating water using less energy

One of the most common upgrades in hospitals is to replace traditional hot water systems that use steam to heat water in large shell-and-tube calorifiers. These either store the water in the body of the vessel or in additional hot water storage tanks. Storing hot water is inherently inefficient because heat is being lost continually. An additional risk associated with water storage is that of Legionella.

Replacing these calorifiers with steam-heated hot water on-demand systems that use compact plate heat exchangers can deliver energy savings of up to 20%. Further benefits of such an upgrade include much reduced maintenance because calorifiers tend to be large pressure vessels that require regular strip-downs for insurance inspections. They take up valuable floor space and unlike compact plate heat exchanger systems cannot be resized in response to changes in demand, for example, when a ward closes. Plate heat exchangers are easier to control for greater water temperature accuracy than is usually possible with shell-and-tube calorifiers. Eliminating the need to store heated water also removes the risk of Legionella if the system is not managed and maintained carefully.

On-demand steam-to-hot-water systems can be delivered as a complete skid-mounted assembly. This makes installation quick and easy because the complete package only needs to be hooked up to the site’s services and commissioned, saving the time and costs involved in building conventional heating systems on site. Furthermore, the whole package is factory tested and guaranteed to work as specified, eliminating the risk of compatibility problems between components.

The energy-saving benefits of packaged steam-to-hot-water solutions can be further boosted by precise control technology that ensures all the useful energy is extracted from the steam before the resulting condensate is returned to the boiler. For a detailed description of heat transfer, please see the Spirax Sarco Heat Transfer White Paper. http://www.spiraxsarco.com/uk/about/news/news-article.asp?news_id=132
Case Study: Heat exchanger systems help Eastbourne Hospital meet NHS emissions guidance

Two Spirax Sarco EasiHeat™ packaged steam-to-hot-water solutions are providing heating and hot water at Eastbourne District General Hospital’s new Endoscopy Unit, while also helping to meet NHS emissions guidelines. Decentralised gas-fired hot water boilers would not have met the emissions requirements, so instead the EasiHeats were specified, using plant steam from the hospital’s existing boiler house.

“By involving Spirax Sarco in the project’s design and specification phase, we were able to save substantial costs by installing just two EasiHeats. That’s because the EasiHeats’ plate heat exchanger design will allow us to simply add more plates into the frame to expand capacity as demand rises, avoiding the need to buy two extra units,” said Mr Paul Gardiner, Estates Officer at Eastbourne District General Hospital.

The hospital was confident in the reliability and operational cost-saving capabilities of EasiHeats, having previously deployed them to replace calorifiers in the main hospital plant room to eliminate temperature control problems and reduce maintenance.
3.3.2 Closed systems achieve maximum energy recovery

The recovery of condensate and flash steam are two of the best ways to see substantial savings in energy and water costs. Using the heat from condensed steam to preheat boiler feedwater saves energy. However, many boiler houses use a boiler feedtank at atmospheric pressure, and there is a limit to the amount of energy that can be recovered by feeding hot condensate and flash steam in to the tank. Clearly, the water in such a system cannot exceed 100°C.

Furthermore, the boiler feedwater is usually maintained at 85°C or 90°C to avoid cavitation, in which bubbles form and collapse within the low pressure (upstream) side of the boiler feed pump, quickly damaging the pump. In addition, up to half of the recoverable energy in the condensate can be lost as flash steam, which is generated as condensate leaves the pressurised steam system and returns to atmospheric pressure.

An innovative solution that solves all these issues is to install a closed system that recovers the energy from both the condensate and the flash steam. By transferring the recovered energy into the high pressure side of the boiler feed pump, the water entering the boiler can be raised to well above 100°C without causing pump cavitation.

Figure 2: Implementing a closed system to recover the energy from condensate and flash steam can substantially reduce energy consumption
Case Study: Doncaster Royal Infirmary replaces conventional heating and hot water calorifiers

The installation of two Spirax Sarco EasiHeat™ packaged steam-to-hot-water systems by Doncaster Royal Infirmary brings its tally to 12, underlining the hospital’s confidence in the technology’s superior reliability and energy efficiency compared to shell-and-tube calorifiers.

The most recent EasiHeats have replaced calorifiers to deliver Low Temperature Hot Water (LTHW) and Domestic Hot Water (DHW) to some areas of the hospital. With the latest installed units, the 800-bed district general hospital has now re-equipped four of its plant rooms and is looking to do the same in other areas in the near future.

“We have replaced some of our existing calorifiers as part of our investment in energy saving and carbon reduction as funds become available. Since the first four EasiHeat units were installed, they have done exactly what they are supposed to, with not a minute’s bother,” explains Mr Les Durnin, Estates Manager Engineering, at Royal Doncaster Infirmary. “We chose the most energy efficient and reliable solution we could find, and the units have proven to be excellent. Payback is within three to four years.”

Furthermore, being compact, the EasiHeats free up considerable space. “The plant rooms are now cooler, easier to work in and look much neater. The calorifiers were prone to leak and were poorly insulated. You could really feel the heat when you walked into a plant room,” says Mr Durnin.

3.3.3 Save energy and boost system performance with reverse osmosis

A clean water supply is the basic starting point for any efficient steam system. Raw water contains dissolved solids and gases, suspended solids and scum-forming substances that can degrade the performance of steam systems through corrosion, a build-up of deposits and foaming that can interfere with heat transfer and cause waterlogging.

Effective water treatment tackles these problems at source. The traditional approach uses water softening supplemented by chemical treatment. More recently, reverse osmosis (RO) is becoming increasingly popular.

RO provides an alternative to traditional chemical-based water treatments. It removes virtually all salts from the incoming water supply (it may sometimes require some anti-scaling chemicals). RO forces water through a semi-permeable membrane to strip out nearly all the contaminants. The resulting pure water will have had 98-99% of its salts removed.

An RO plant can deliver energy and water savings because it reduces significantly the need for boiler blowdown by decreasing the quantity of Total Dissolved Solids (TDS) in the boiler. RO also reduces the need for boiler treatment chemicals, while reduced scale formation helps minimise ongoing maintenance costs.
In addition, RO avoids many of the issues that need to be tackled with water softeners, such as carbon dioxide corrosion, chloride-induced corrosion, high TDS, and carbonates and bicarbonates that pass through softeners which may cause corrosion.


3.3.4 Sub-cooling condensate can save 10% in energy
A technique that is becoming increasingly beneficial to a healthcare industry faced with the growing need to reduce emissions is that of sub-cooling condensate, which allows steam system users to extract more energy before returning condensate to the boiler. Energy savings of up to 10% in the steam system are possible.

Sub-cooling works by reducing the temperature at which steam traps remove the condensate from the steam line, often by changing the type or rating of the traps. Sub-cooling can also improve the plant's overall steam balance by, for example, eliminating excess flash steam and dealing with choking problems.

However, sub-cooling condensate may not be suitable for every installation because the condensate will be at a lower temperature when it eventually

Case Study: Isle of Man hospital saves £14,500 with flash steam recovery from Spirax Sarco

Noble’s Hospital laundry is saving more than £14,500 a year in energy, water and treatment chemicals, thanks to the installation of a FREME (Flash Recovery Energy Management Equipment) system from Spirax Sarco. Over the 20-year life of the equipment, the resulting fuel savings are expected to prevent the generation of over 1,750 tonnes of CO₂, benefitting the environment as well as the bottom line. The laundry uses steam for washing, drying and ironing.

Before this project, the laundry already aimed to use as much of the condensate from its steam system as possible to preheat water entering the plant’s three boilers, but some of the energy was lost as flash steam as the hot liquid moved from the higher-pressure steam distribution system to the condensate return system, which is at atmospheric pressure.

Deploying the FREME system has enabled Noble’s laundry to raise the temperature of boiler feedwater to up to 125°C without causing cavitation problems. This has led in turn to a reduction in fuel costs of around £12,000 per year. In addition, reducing the requirement to top up the boiler with raw make-up water has resulted in over £2,500 in further savings.

“By implementing the FREME the department has reduced the impact of rising costs of energy, ensuring the laundry provision at the hospital remains as cost efficient as possible,” says Estates Engineering Officer Gary Radcliffe. “The fundamental project achievements are those of water and energy recycling, making the laundry system more energy efficient. The project also achieves an essential reduction in chemical consumption which reduces the impact on the environment.”

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However, sub-cooling condensate may not be suitable for every installation because the condensate will be at a lower temperature when it eventually
returns to the boiler feed system, so any energy-saving benefit must be balanced against the need to augment feedwater heating in the boiler room. With multiple factors to consider, it can be complex to get the right balance and users are advised to seek expert support if they’re trying to decide if sub-cooling is right for their installation.

### 3.3.5 Microturbines generate electricity from steam pressure reduction

Typically, steam systems raise high pressure steam in the boiler, then reduce the pressure before the steam is actually used in an application. Generating and distributing steam at higher pressure increases the thermal storage capacity of the boiler, helping it to cope more efficiently with fluctuating loads, minimising the risks of producing wet steam. Also, smaller bore steam pipes can be used for distribution, resulting in lower capital cost for materials such as the pipes themselves and their flanges, supports, insulation and labour, as well as ancillary equipment.

Conventionally, high pressure steam from the boiler is lowered to a working pressure by using a pressure reducing station comprising a valve and associated controls and ancillaries. An innovative way to reduce this pressure is to pass the steam through a microturbine, which enables operators to use the energy released by that pressure drop to supplement their existing electricity supply.

**Figure 3:** Using a microturbine in parallel with a conventional pressure reducing station to supplement a steam system operator’s electricity supply
Spirax Sarco solutions for reducing healthcare energy consumption and emissions

EasiHeat™ steam-to-hot-water packaged solutions
Spirax EasiHeat for delivering hot water and heating on-demand deliver up to 20% energy savings compared to conventional steam-to-water heating systems.

3.3.6 The low-carbon steam plant room
Many of the innovations described above can be used to upgrade traditional steam plant rooms to what may be called a low-carbon steam plant room. As well as helping healthcare facilities to meet their carbon and energy reduction commitments by eliminating flash steam losses and sub-cooling condensate, the low-carbon steam plant room can also dramatically reduce maintenance requirements and can eliminate the need for regular insurance inspections, meet Health and Safety and reduce Legionella risks.

4.0 Spirax Sarco solutions for reducing healthcare energy consumption and emissions

Spirax Sarco products, packaged solutions and technical support help to maximise the efficiency of hospital steam systems, from the energy centre through steam distribution to the condensate return system. Ensuring that each system is designed and built to match healthcare needs is a core advantage of partnering with Spirax Sarco.

Spirax Sarco offers a variety of innovative solutions to help the healthcare sector lower its energy consumption and cut its greenhouse gas emissions, as well as reducing risks.

4.1 EasiHeat™ steam-to-hot-water packaged solutions
EasiHeat is a ready-to-install solution that uses steam in a compact, plate-and-frame heat exchanger to provide instant hot water for domestic hot water (DHW) and space heating. The resulting supply of hot water is available on-demand, without the need for a buffer vessel or storage tank. The controls are matched to the system, enabling an EasiHeat unit to control output temperatures to within ±1°C.

EasiHeat features optional Spirax Intelligent Monitoring System (SIMS™). SIMS is an advanced communications platform enabling remote monitoring, performance trending and fault diagnostics that makes it easy to save energy and control critical applications. SIMS uses a touchscreen interface to deliver key performance data to operators, such as steam use, fuel consumption and temperature. This helps operators to monitor energy use closely and automatically adjust the system to optimise efficiency. The interface is intuitive and can be used by operators with limited controls experience.

A steam microturbine producing 100 kW of electrical power can generate typical cost savings of more than £75,000.

Spirax EasiHeat can deliver up to 20% energy savings compared to conventional steam-to-water heating systems
4.2 FREME flash steam and energy recovery system
The Spirax Flash Recovery Energy Management Equipment (FREME) creates a completely closed steam system under constant pressure that can recover all the energy from returned condensate and flash steam without wastefully dumping or venting surplus energy from the system. The system feeds the energy from the returned condensate into the high-pressure side of the boiler feed pumps.
FREME is proven to achieve energy savings of up to 26%, delivering an attractive return on investment. Heat and water previously lost from the system can be recovered fully, reducing utility bills, water treatment chemical costs and CO₂ emissions.

4.3 Reverse Osmosis systems reduce boiler fuel costs
Spirax Reverse Osmosis (RO) systems can help steam system operators to cut their boiler fuel costs, reduce the need for boiler treatment chemicals and minimise maintenance costs.

The systems deliver energy and water savings by significantly reducing the need for boiler blowdown. Because RO extracts almost all of the salts and most other contaminants from the incoming water supply, TDS in the boiler are almost completely eliminated; RO is proven to remove up to 99% of TDS. This reduces the need for boiler blowdown, saving both energy and water and enabling steam operators to cut their boiler fuel costs by as much as 3%.

4.4 Spirax Eco-Save™ for extracting up to 10% more energy from steam systems
Spirax Eco-Save is a steam trapping solution that can extract up to a further 10% of energy from a steam system. It incorporates an energy-saving steam trap covered by a 10 year warranty and its stainless steel construction allows for fast and simple maintenance.

4.5 Clean Steam Generators
Spirax Sarco offers a range of clean steam generators from compact modular units, up to large units suitable for central sterilisation facilities. The generators are ideal for hospital sterilisation and comply with the demanding requirements of HTM 2010 and 2031.
4.6 Surveys and system audits
Spirax Sarco offers steam system audits that are tailored to an installation’s requirements, whether that’s energy efficiency, Health and Safety or achieving best practice. Audits range from a check-up for a single plant room to benchmarking an entire steam system, from the water treatment plant right through to condensate return.

Audits identify achievable energy savings with calculated return on investment, highlight Health and Safety shortfalls, detect water treatment issues such as corrosion and scaling, identify system improvements and advise on good engineering practice.

4.7 Maintenance services
Preventative maintenance of steam and fluid systems is proven to help organisations meet Health and Safety requirements, lower energy consumption, maintain steam quality and cut operating costs. Spirax Sarco Service Agreements implement preventative maintenance as well as covering faults, inefficiencies and breakdowns. Typically lasting from one to five years, a Service Agreement can include unplanned service call-out days with rapid response.

4.8 Training services
Well trained personnel are crucial to achieving the most efficient and safest steam system performance. Spirax Sarco provides training for healthcare personnel involved in the design, installation, operation, optimisation and maintenance of steam systems.

Many of the courses are accredited and result in recognised qualifications. All are delivered by highly knowledgeable trainers with years of practical steam system experience behind them.
5.0 Conclusion

Faced with stringent emissions targets, the NHS and the wider UK healthcare sector is maintaining a sharp focus on finding ways to improve its overall energy efficiency, whether that means upgrading existing facilities and operational practices or installing new technologies.

Steam is used widely across the NHS estate to provide hot water, heating and sterilisation services. Steam plant accounts for a significant amount of the sector’s fuel consumption, yet there are many conventional ways and innovative technologies available to improve steam system energy efficiency.

This White Paper outlines some of the options available and gives examples of the potential savings that can be achieved.

However, steam system engineering is a specialist area. Finding new areas for implementing energy saving measures takes dedicated expertise and practical experience of other facilities. A good starting point for getting the most out of any steam system is a simple ‘walk the plant’ assessment by a Spirax Sarco engineer who will quickly spot potential areas for improvement. These may range from a major project to easy-to-implement and relatively low cost improvements that can bring huge savings in fuel bills, maintenance work and carbon emissions – all with a rapid payback.

The initial assessment of opportunities can be followed by a more detailed analysis to highlight the costs involved, the savings to be gained and even support in getting available funding to implement the project.

Find out more
To find out more about Spirax Sarco healthcare solutions:

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Case Study: Spirax Sarco helps Kettering General secure funding for £250k energy-saving project

When Spirax Sarco supplied new, energy-saving heating and hot water systems for Kettering General Hospital, the company also played a critical role in getting government funding for the project. Spirax Sarco calculated that switching from calorifiers to the company’s EasiHeat™ systems would reduce the energy consumed in two of the hospital’s plant rooms by between 6 and 10%, which enabled Kettering to successfully bid for £250k from a government energy funding scheme.

The fund is a Department of Health initiative to promote NHS projects that will reduce carbon emissions by improving energy efficiency. “Spirax Sarco did all the heat saving calculations so we could put a bid in. It saved us a lot of work and made it a really easy process,” said Adrian Coombs, Head of Estates, at Kettering.