

## Flash steam recovery saves Manx hospital £14,500 a year

The laundry at Noble's Hospital on the Isle of Man is saving over £14,500 annually in energy, water, and treatment chemicals, following the installation of a **Spirax Sarco** FREME (Flash Recovery Energy Management Equipment) system.

Over the equipment's 20-year lifetime, Spirax Sarco says the resulting fuel savings are expected to prevent the generation of over 1,750 tonnes of CO<sub>2</sub>.

The laundry previously used as much of the condensate from its steam system as possible to preheat water entering the plant's three boilers, but some energy was lost as flash steam as the hot liquid moved from the higher pressure steam distribution system to the condensate return system. At Noble's laundry, this created visible plumes of flash steam as it was vented to the atmosphere.

Boiler feed temperature was also



limited, because the closer it is to boiling point, the more chance of cavitation as water enters the boiler feed pumps. Despite engineers limiting the incoming water temperature to 85-95°C, the boiler

feed pumps were still experiencing cavitation and premature wear.

The FREME system sees all the usable heat in the condensate returned to the boiler. Returning condensate is passed through a flash steam separation vessel, and the separate flash steam and condensate streams through dedicated plate heat exchangers, where they each heat the boiler feedwater, all on the high-pressure side of the boiler feed pumps, so that the system can safely heat water to over 100°C without boiling and causing pump cavitation.

By enabling the laundry to raise its boiler feedwater temperature to up to 125°C without causing cavitation problems, the system has cut annual fuel costs by around £12,000, while the reduced need to top up the boiler with raw make-up water has saved a further £2,500 annually.

## CHP schemes 'with no upfront investment requirement'

**GE** (which will provide commercial and technical support) has co-launched with Clarke Energy, (installer of 770 CHP engines in the UK to date), fund manager SDCL EE (principal fund manager for the Green Investment Bank), and the NHS Confederation, a new funding scheme, 'Powering Health: Fully Funded CHP Solutions', that the project partners say will enable the delivery of CHP systems for qualifying

UK healthcare clients 'with no upfront investment requirement'.

The Fund will finance the design, installation, and servicing, of bespoke systems and solutions. The scheme partners say: "Under a 7-10 year energy services agreement, the Fund will invest in CHP systems to provide sustainable heat and power, and share in the measured, verified, energy cost savings. At the term's end, all future savings and system

ownership will revert to the client."

Key claimed benefits of the new funding scheme include:

- A services agreement with no upfront investment requirement.
- High efficiency, low carbon heat and power at lower cost.
- Innovative solutions under a performance-based contract.
- Design and operational risks transferred to the Fund.

## NHS Trust's solar panel solution

East of England Ambulance Service NHS Trust will reportedly gain at least £800,000 over the next 20 years – through a combination of Feed-In-Tariff revenue and lower electricity bills – following the installation, by Photon Energy, of solar panels from **Conergy** to the roofs of a number of its control centres.

Conergy, among Europe's largest solar technology suppliers for large-scale projects, says that five solar arrays featuring 200 Conergy P-Series modules generating 50 kW each have been fitted to the roofs of NHS control centres in Braintree, Norwich, Luton, Melbourn, and Welwyn Garden City. These facilities coordinate over 500,000 call-outs annually across Bedfordshire, Cambridgeshire, Essex, Hertfordshire, Norfolk, and Suffolk.

The centres will be able to generate 195,000 kilowatt hours of 'clean' solar electricity a year. Alongside the energy



Courtesy of Photon Energy

savings, the Trust will receive money from the Government's Feed-In-Tariff for renewably-generated electricity, and by selling unused electricity to the National Grid. Conergy adds: "The panels will deliver cost savings and new revenues of £42,000 annually over 20 years, cutting the Trust's carbon emissions by 103 tonnes a year." Payback is expected within five years.

## EPC project under way in Newham

**E.ON** has begun working with Newham University Hospital in East London to improve the Hospital's energy efficiency and reduce its carbon emissions, via a project part of the London Development Agency's RE:FIT programme, which aims to reduce London's carbon emissions by updating public buildings via 'the most effective energy-saving measures'.

E.ON has signed a six-year Energy Performance Contract with the Hospital.

The project's first phase, involving replacing the current 'relatively old and inefficient' air handling units (AHUs), which supply heating, cooling, and ventilation, to wards and theatres, with more energy-efficient units, should cut annual energy consumption by over 940,000 kW hours, achieving payback within seven years, and paring carbon emissions by over 3,000 tonnes.

## Income from your diesel generator

Dale Power Solutions says its Short Term Operating Reserve (STOR) programme creates two potential revenue streams from a customer organisation's standby generating capacity, while reducing its carbon footprint, and saving it energy.

The company said: "Power availability, and the contribution of power to alleviate load spikes in the national grid, represent two of the largest potential revenue opportunities for diesel generator users. When electrical demand 'spikes', it is considerably easier for the national grid to manage the additional demand by calling upon a small-scale local supply, than bringing in a major power station. A consistent payment is made to the supplier – in return for making power generating capacity available to the grid – at the point when their generator is called upon."

Dale Power Solutions emphasises that STOR benefits users 'by providing a new revenue stream utilising an existing asset'. Participating, it says, enables them to:



- 'Earn more money', and reduce their maintenance costs, via a 'no cost, no obligation, no risk' route.
- Guarantee (via back-up and support from Dale Power Solutions) that their generator will 'work when they need it, and earn revenue when they do not'.
- 'Eliminate the need for expensive and time-consuming load bank testing'.
- Improve their 'green' credentials.
- Secure multiple payments for multiple generators.

## Data into 'actionable intelligence'

Schneider Electric, a 'global energy management specialist', says its new Building Analytics software offers building owners and facility managers 'deep insight' into how a building's energy is being used.

Using 'powerful analytics', the software offers end-users reports on energy usage and performance, and building comfort, 'turning data into actionable intelligence'. Schneider Electric explains: "The software uses advanced algorithms and cloud-based capabilities to continuously monitor and analyse real-time data and historical trends from building sensors, control

systems, and utility meters, automatically pulled from the building energy management system. Automated fault detection and diagnostics identify building operational deficiencies, and generate comprehensive customised reports. These identify specific cost and energy-saving opportunities prioritised by impact on energy use, cost savings, and tenant comfort. Diagnostics can also document performance measurement and verification at equipment level, for auditable results of capital investment programmes."

## Taking the strain off boilers

Marshall-Tufflex says its new Commercial Boiler Manager unit 'can cut 20% (subject to boiler use pattern) off' heating and hot water bills, and prolong commercial boiler life, 'without compromising user comfort'.

The system, which is suitable for installation with single and linked pairs of boilers under a common header where boiler output exceeds 30 kW, uses digital microprocessors programmed to reduce unnecessary firing, not only cutting energy bills and CO<sub>2</sub> emissions, but also prolonging the lifespan of boilers, 'simply because they are not working so hard'.

'Compact, and straightforward for a



qualified electrician to install', the system uses 'a unique variable thermal response programme' to manage combi, condensing, and modulating boilers fuelled by gas, oil, or LPG. Electronic sensors fitted to flow and return pipes monitor outgoing and

incoming water temperatures, varying system temperature/firing accordingly, and 'significantly reducing' fuel wastage caused by temperature overshoot, heat saturation of the heat exchanger, flue losses, and unnecessary cycling.

The system can be used with boiler plant managed by a building energy management system.

## NHS Surrey standardises in 20-site upgrade

An NHS Surrey programme to upgrade heating and hot water systems across over 20 sites has seen the organisation standardise on new equipment from Hamworthy Heating.

Gary White, programme manager, Surrey Primary Care Trust (PCT), said: "Replacing ageing boilers and water heaters, we were looking to lower our energy bills and carbon emissions. Our Estates Department wanted to standardise boilers and equipment across the sites. Hamworthy's diverse, energy-efficient product range enabled us to select the most suitable boiler and water heater for each application."

At the 20-bed Molesey Hospital, three existing gas-fired atmospheric boilers were replaced with two Purewell VariHeat 70 kW gas-fired condensing boilers. Two new Dorchester DR-FC Evo 30 direct-fired condensing water heaters (pictured in the plantroom with a Chesil pressurisation unit) provide 'highly efficient hot water generation'.

Hugo Jimenez, senior mechanical designer, MCA Consulting, who specified the equipment, said: "We chose to separate the heating and hot water due to the 24/7 demands placed on the system, and the requirement for critical hot water to reach temperature very quickly."

While the three atmospheric on/off boilers removed from the site gave a 123 kW total output, a 3:1 turndown ratio, and seasonal efficiencies of 78%, comparative figures for the two new condensing boilers are 140 kW, 7:1, and 95%.

Hot water is now provided by the two condensing water heaters with a total continuous output of 1,260 litres/hour, thermal efficiencies of 98%, low NOx levels, and 'superior controls'.



## Sustainability event's racecourse setting

IHEEM President, Greg Markham, will be among speakers at a 'Public Sector Sustainability Conference' being held by energy solutions specialist, and manufacturer of the Powerstar range of voltage optimisation equipment, **EMSc (UK)**, at Epsom Downs Racecourse, Surrey, on 25 September.

The free-to-attend event will provide advice on best practice, and information on how to improve energy efficiency, 'and the importance of doing so'. It follows two

'very successful' sustainability conferences held by EMSc (UK) in the past year for the manufacturing and leisure industries, in Sheffield and London respectively.

Alongside Greg Markham, Dr David Hickie, executive director of the Public Sector Sustainability Association (PSSA), and Paul Burnett, group development director of Imtech, will deliver keynotes. Supporting the guest speakers will be EMSc (UK)'s own public sector business

consultants for Powerstar voltage optimisation 'solutions', Duncan Agnew (NHS), and Terry Shemwell (local authorities)

The event should be of interest to senior personnel including sustainability, energy, and facilities managers, heads of estates, property managers, operations managers, heads of services, directors, and chief executives. Visit [www.ems-uk.org](http://www.ems-uk.org), or T: 0114 2576 200, for more information.



## Has LED lighting's time come?

LED lighting is 'ever evolving, and strengthening its position in the mainstream lighting market'.

So says Gloucestershire-based LED lighting specialist, **Exled**, which says increasing uptake of the 'almost zero maintenance' technology has helped to lower LED manufacturing costs, 'making the initial outlay costs more manageable', and enabling payback 'within around two years, based on the energy savings alone'.

Exled's specifically designed LED

lighting range for healthcare boasts 'exceptional light output', clean area approved fittings, ease of installation, and 'a long lifetime of 50,000 hours'. Emergency back-up systems are also available.

Part of the company's Healthcare Lighting series is the Nova Panel range, offering a wide selection of low energy LED panels in cool and neutral white – 'from a stylish three-light section panel, to a versatile dimmable panel', and extending from IP20 to IP54.

## High heat and power demand met

Ty Penrhos, a three-storey Hafod Care dementia care home in Caerphilly with a particularly high demand for both heat and power, '24/7', is benefiting from two forms of renewable energy supplied by Baxi Commercial.

A 'mini-CHP system' from **Baxi-SenerTec UK** generates electricity, and produces useful heat, while a solar water heating system from **Andrews Water Heaters** pre-heats domestic hot water. Building services were designed by McCann & Partners.

Two Baxi-SenerTec Dachs gas-fired mini-CHP units act as lead boilers for the space heating system; each has an electrical output of 5.5 kW, and a minimum heat output of 12.5 kW.

Using an optional condenser, the Dachs unit can produce up to 15.5 kW of heat. Where heat demand is unreliable, use of a buffer vessel can keep the unit running, and maintain the electricity supply, while avoiding engine wear and tear due to unnecessary shut-downs.

In its first year's operation, the Dachs system had run for 3,544 hours, generating approximately 49,000 kW of heat, and 19,400 kW of electricity. The



heat generated also contributes indirectly to domestic hot water production via the space heating system. The equipment was installed by Whitehead Building Services.

Four evacuated tube SOLARflo solar collectors on the pitched roof supply heat to a 450 litre twin-coil cylinder. These evacuated tube collectors are reportedly 'ideal for larger commercial water heating applications', with 'a higher annual average thermal efficiency than glazed flat plate collectors and, operating at lower ambient temperatures, the ability to provide a higher annual percentage of domestic hot water'.

## Innovation in 'clean, green, energy'

Capstone microturbine CHP and CCHP solutions "reduce energy costs, ensure power availability, and have 'a near-zero emissions profile'," says **Turner EPS**, Capstone Turbine Corporation's UK distributor.

Capstone microturbines 'have just one moving part, no gearbox or other mechanicals, and use no lubricants or hazardous materials'. To produce 120 kW of hot water using 65 kW of electricity in a CHP application, they require 230 kW of fuel. To achieve the same electricity and hot water outputs, Turner EPS says some traditional energy sources use 'up to 33% more fuel'.

Many organisations have reportedly boosted energy efficiency and cut power costs using Capstone microturbines in CHP (or cogeneration) or CCHP (or trigeneration) applications.

The company said: "As microturbines generate electricity, they produce exhaust heat. With CHP and CCHP, the waste heat is captured, rather than released to the atmosphere. This thermal power is then, for example, used to heat the building, provide warm water for the laundry, or heat swimming pool water. In a CCHP application, an absorption chiller is added. Steam can also be produced as a bi-product of the microturbine exhaust, through the absorption chiller."

Capstone is to supply two C200 microturbines to the Splošna bolnišnica Novo Mesto, a general hospital in Slovenia. Rooftop-mounted, they will operate in a CCHP application at the 377-bed regional hospital. The natural gas-fuelled, grid-connected microturbines will provide electricity, heating, and domestic hot water.



## 'Intelligent' technology cuts energy use at Charing Cross Hospital

**Trend Control Systems** says that, for many healthcare estates managers, the most effective way to control their energy use could be 'right under their noses – using building energy management systems (BEMS)'.

For example, London's Charing Cross Hospital has achieved 'significant annual gas and electricity savings' through energy-saving initiatives based on three key 'rapid payback action strands' – improved monitoring and optimisation of heating and ventilation using a Trend BEMS, installing variable speed drives (VSDs) on 70 air circulation fans, and steps to reduce the electricity used by lighting.

The Hospital recently upgraded its existing Trend BEMS, simultaneously installing energy meters in all main plant rooms, which are now monitored via the BEMS. The resulting data allowed the Estates Department to identify and cut energy wastage 'substantially'.

Trend explains: "While the Hospital operates '24/7', some areas are not used overnight. Using the BEMS, estates staff examined all parts of the buildings, and could then match heating times closely with periods of occupation."



Installing VSDs with high efficiency motors on circulation fans also saved substantial energy. The fans previously operated only at maximum speed, but now the BEMS monitors air circulation demand in each area, and then commands the VSDs to adjust fan motor speeds accordingly.

The Trend BEMS is now also controlling the hospital's cooling towers and main chiller plant. Chillers switch off when the outside air temperature falls below 15°C, and then harness 'free cooling' provided by the outside air.

The Hospital is aiming 'to match lighting with needs'. Lighting switches off in many areas when unoccupied, while in others, occupancy sensors activate lights when staff enter. Many lamps have been replaced with 'intelligent' light fittings.