

Opportunity and frustration

BERR's Renewable Heat Consultation is a welcome recognition of the role that heat pumps can play in the new energy world that we are entering.

I suppose we will look back on this period as a major re-alignment of attitudes towards the creation and use of energy, and perhaps not be too surprised at the confusion and flurry of opinions that we are witnessing. But it has been hard to see the wood for the biomass (trees) in the welter of consultations, initiatives, misguided advice and foot stamping by unrealistic interest groups. HPA has participated in at least 16 consultations in the last 8 months with lots more on the way. We have also helped to create the MCS scheme, worked on part L committees and written a series of articles published alongside *Heat Pump News* to raise the profile of heat pumps.

All this is not only to further the interests of heat pumps — it is as much to keep peoples' feet firmly on the ground. We are not a political lobby group, but a technically orientated association determined to accurately project the merits of our technology. We hope that everyone seeking information on heat pumps will come to us for reliable and technically correct information.

We have had good success on ground source systems. HPA efforts, with those of our partner GSHPA, have achieved recognition of the true nature of the product as highly efficient, reliable and low carbon. Air source heat pumps, a complementary technology, are in the process of achieving the same level of recognition. It is our job to progress that knowledge of both technologies at a time when the country is trying to learn quickly about new products. Look at the applications in this and other *Heat Pump News* or on the website if you'd like more guidance.

One of the biggest problems we currently face is the dissemination of information from government bodies. With such a fast pace this may seem inevitable, but now is the time for a big effort from, most notably, BERR, DEFRA and CLG to coordinate their definitions, schemes and advice to users and local authorities so they are better able to understand and promote local energy efficiency and renewables.

As for 'Renewables', the BERR consultation goes a long way to ending the discussions about what is a renewable technology. It's not actually ↗

School pool project is energy champion



A school pool project that has seen its annual running costs reduce by 61% following the installation of a Calorex heat recovery and dehumidification system is the inaugural winner of a new environmental excellence award, presented by the UK pool industry.

Despite increases in energy fuel costs, Oundle School in Northamptonshire has seen running costs on its pool drop from £22k to £11k per annum with total kW/hr usage figures reduced by one third. Associated CO₂ emissions were also reduced from 422 to 224 tonnes per annum, a reduction of over 45%.

Heating and ventilation specialist, EPS, was presented with the Peter Geekie Award by the Swimming Pool and Allied Trade Association (SPATA), at the industry's annual awards ceremony, for achieving the savings, despite the use of more hot water while at the same time improving conditions in the pool and changing room areas.

"For each kW of electrical energy used to operate a Calorex dehumidification unit up to 3.5 kW of energy is recovered — the only humidity control system which recovers more energy than it uses," said John Scott, of Basildon based EPS, specialists in wet leisure environmental control systems. "It is a triple winner that saves energy and reduces running costs with minimum capital outlay."

EPS installed a Calorex HRD and a new return air duct to allow air to be re-circulated. Energy-efficient HRD systems remove moisture from the atmosphere, collect its latent energy and re-use it to assist water and air heating, creating a self-perpetuating heat cycle that ensures energy costs are kept to a minimum. Originally, the pool heating was run as a total loss system with roof fans and variable speed supply fans. The changing room system was fixed speed, total loss with roof extractors.

www.calorex.com

MCS Update

The purpose of the Microgeneration Certification Scheme (MCS) is to allow consumers to buy microgeneration technologies from approved installers supplying approved equipment. This ambitious scheme is demanding of all applicants, but will benefit consumers and all those suppliers who make the investment. The first heat pump products are now approved. Others will follow very soon. Applications from installers are

that difficult. If a product harnesses the energy provided by a renewable source — ground, air, the sun, wind, water — it's a renewable. Some renewables produce heat, some produce energy, and need to be treated differently in building services. All the frustrating discussions are

rising despite the poor promotion of MCS, so consumers should soon be able to find a qualified installer in their area.

All applicants are assessed by BRE but, in October 2008 other UKAS approved accreditation bodies will be able to offer the service, creating competition among the bodies and a higher capacity for processing applicants.

For information on approved products and installers visit BRE's website and look at Green Book.

hopefully coming to an end, and we can all get on and seize the opportunities of the new era!

Tony Bowen,
President,
HPA

Visit our Website
www.heatpumps.org.uk

Ecodan heat pump wins environmental award

Mitsubishi Electric's low carbon heating system, Ecodan, has secured recognition for its carbon saving potential at the Environmental and Sustainability Awards 2008.

The Ecodan air source heat pump system won The Environmental Energy Product/Service category with the judges praising Mitsubishi Electric for its far sightedness, saying that whilst air source technology was not new, the company had . . . 'packaged Ecodan into a neat unit that could prove acceptable to the environmentally-savvy domestic user who wanted to do his/her bit to cut carbon emissions'.

John Kellett, general manager of Mitsubishi Electric's Heating Division said, "The judges have acknowledged our efforts to provide households with a simple and straightforward way of achieving reliable heating and hot water whilst significantly reducing CO₂ emissions".

Ecodan, which is the company's first domestic heating product in the UK, runs off a normal domestic electric circuit and can be installed by a suitably qualified plumber who has been on the one-day accreditation course. It doesn't need CORGI and it doesn't need F-Gas as the refrigerant circuit is self contained and factory sealed.

Ecodan has been designed specifically for the UK residential sector. The efficient low carbon heating system can reduce CO₂ emissions by up to 35% compared to a modern gas condensing boiler and can help 'new builds' achieve the Code for Sustainable Homes.

The average UK household produces over 5 tonnes of CO₂ a year with space and water heating accounting for more than 73% of this. "One of the easiest ways of achieving a significant reduction in CO₂ emissions would be through the greater use of heat pump technology which extracts free energy from the surrounding air," added Mr Kellett. "This energy that surrounds us is a key sustainable resource that doesn't currently factor into many people's thinking."

www.mitsubishielectric.co.uk/heating



Daikin launches air-to-water heat pump chiller with inverter driven compressor



The new EWYD-AJYNN heat pump inverter chiller from Daikin Europe NV incorporates an inverter driven single screw compressor.

"During the heating season," says Daikin, "when the outside temperature decreases, the thermal load requirement of a building increases, although a conventional heat pump's heating capacity actually decreases as the outside temperature falls. Therefore, a conventional boiler (fossil-fuel fired or electrical) might need to be integrated with the heat pump if the temperature is likely to fall below -1°C."

However, it claims that the EWYD-AJYNN heat pump chiller can fully match the

building's thermal load, even if the ambient temperature falls as low as -12°C. This, it says, is because the inverter boosts the compressor with a frequency increase that exactly follows the required thermal load.

In summer the inverter in the EWYD-AJYNN, says Daikin, boosts the compressor frequency rate to match the required cooling load.

A Daikin Europe product spokesman said, "The EWYD-AJYNN heat pump inverter unit can vary its compressor speed in response to load conditions by means of its in house programmed PID microprocessor controller. The unit is extremely energy efficient, both in cooling and heating, with good EER and COP values and is designed and optimised for easy and fast network connection with building automation and management systems."

There are a variety of sizes for large, industrial and/or commercial buildings with capacities from 255 to 385 kW in cooling and 274 to 412 kW in heating mode.

www.daikin.eu

Heat recovery for the process industry

A study examining the opportunities for heat recovery in the process industries that has been undertaken by David Reay was completed in April 2007. "Feedback from the Carbon Trust on the heat pump aspects have been non-existent, and this, together with the CT's inconsistency in another important area of process technology (process intensification), prompted me", he said, "to write an editorial for *Applied Thermal Engineering* on the topic."

Extracts below give data on the potential for heat pumps in the UK process sector that we identified.

"Several organisations such as the IEA Heat Pump Centre and the European and UK Heat Pump Associations have been promoting heat pump technology for decades, and while some countries have seen massive increases in their use in buildings, their take-up by the process industries has been woefully slow.

In the UK, a study completed for the Carbon Trust showed that if heat pumps and MVR (mechanical vapour recompression) systems were applied to all appropriate drying/separation processes, which consume 2821 ktcoe/annum, energy savings of about

35% might result, saving 987 ktcoe/annum. This could be mirrored in most industrialised nations. At present, of course, the manufacturing capability to produce such equipment within a reasonable timescale does not exist, and, frustratingly, the heat pump industry at the process end of the scale is substantially smaller than it was in the 1970s, when similar improvements could have been made to separation process efficiencies."

"The recent (last 35 years) history of energy efficient processes has seen many technologies receive substantial R&D funding, periodic official support and subsequent neglect, and a plethora of excuses for 'end users' as to why investment in such a technology would not make good business sense. In general, the quality of the technology is good (in the case of both heat pumps and process intensification) but progress has been hindered by the inconsistencies in decision-making and the ability of funding bodies to incorporate disincentives in their application procedures.

It is to be hoped that global warming will help to focus their minds and open their pockets!"

Heat pumps to play big part at Chillventa

Recognising the growing importance of heat pumps, the organisers of Chillventa, the new 29.046m² exhibition taking place in Nuremberg from October 15 to 17 have organised a variety of seminars and symposia on the subject.

"We realise," said Dr Rainer Jakobs, Deutscher Kälte- und Klimatechnischer Verein (DKV) e.V. (German Refrigeration & Air Conditioning Society), who is the co-ordinator of the Chillventa supporting programme, "that there is a growing interest in all types of heat pump systems."

"Many of the 600 exhibitors at Chillventa will be showing this type of equipment but we wanted to help visitors to the exhibition to understand more about this increasingly important technology and so have organised a full supporting programme of events to do just this."

On the opening day (October 15 for instance DKV is holding an international heat pump symposium from 10.00am to 1.00pm, while heat pumps will be covered in an Asercom and EPEE symposium on EU Regulations from 1.00pm to 5.00pm on the previous day.

FGK, the German institute of Building Air Conditioning is staging a forum on air conditioning for cooling and heating, looking at reverse cycle equipment on the morning of Wednesday (October 15) and in the afternoon of that day DKV is holding a forum on heat pumps for heating only. Both of these will be repeated on Thursday October 16.

"We recognise that heat pumps will play an increasingly important part in the built environment," said Dr Jakobs, "and plan to devote more time and space to them in future exhibitions. Many of Chillventa's honorary sponsors, such as the Test and Training Centre for Heat Pumps in Karlsruhe, have vast sums of knowledge of this technology and through the Chillventa conference and supporting programme this will be available to visitors to the exhibition in October."

www.chillventa.de

CARBON CONVERSION

To calculate the carbon emissions from providing heating, take the useful heat output required and divide by the efficiency of the heating appliance and multiply by the carbon emissions for the fuel used.

Carbon emissions (SAP2005):

Gas – 0.194 kg CO₂/kWh; Oil – 0.265 kg CO₂/kWh; Electricity – 0.422 kg CO₂/kWh

Providing 1 kWh of useful heat using:

- A heat pump, efficiency 320% emits $1 \div 3.2 \times 0.422 = 0.132 \text{ kgCO}_2$.
- A gas condensing boiler, efficiency 90% emits $1 \div 0.9 \times 0.194 = 0.216 \text{ kgCO}_2$.

To convert emissions in kgCO₂ to kgC multiply by 0.2727.

NIBE goes to ground for Wrexham school



A new school has just been completed in North Wales to accommodate 220 children from Nursery age groups through to Year Six. The exterior of the single storey building, although extremely pleasant, is conventional in style. But the method of heating both the building and the water for pupils, staff and kitchens is anything but. With an eye to the future — in terms of both energy costs and environmental considerations — the education authority opted for a system utilising the heat always present at a more or less constant temperature in the 'near-surface geothermal layer' underground.

In a system designed by NIBE Energy Systems Ltd of Chesterfield, eleven boreholes 100 metres deep were drilled into the school grounds before landscaping. Each borehole contains a plastic tube in an elongated u-shape, within which circulates a glycol/water mixture in a closed circuit, working in

rather the same manner as a car's cooling system. Energy from the warm ground is absorbed in the mixture and translated to two inter-connected NIBE Fighter 1330 heat pumps situated in the school's boiler/utilities room. These, with a capacity of 30 kW, convert the latent energy into heat for the water in a fully insulated tank situated near the Fighter units. This in turn feeds the entire under-floor central heating system and the hot water supply for all the school buildings. Back-up heating, if required to act as a boost in times of maximum peak usage, is supplied by a gas boiler.

While the design and installation of the school's geothermal heating was undertaken by NIBE Energy Systems in UK, the equipment used was designed and manufactured by parent company NIBE AB in Sweden.

www.nibe.co.uk

Heat pumps boosted by grants and planning rules

Homeowners, schools and other community organisations interested in fitting heat pumps are being encouraged to do so as the result of an overhaul of the Government's Low Carbon Building Programme (LCBP), which will see more generous grants for schools and public buildings, while the £10m support still available to householders will be extended until 2010 for new applications.

Additionally there is now no need to obtain planning permission to install devices like ground and water source heat pumps, solar panels, and biomass systems. Relaxation of the planning rules for air source heat pumps and micro wind systems is expected to follow shortly.

The changes are:

- From April 1 LCBP Household stream have been extended to June 2010 or as long as funds are available, whichever is the sooner.
- From April 1 there has been an increase in grant caps to 50% across all technologies for the schools, charities and public sector phase of LCBP.
- From 6 April, many homeowners will be able to install microgeneration equipment, like heat pumps and solar panels, without needing to get planning permission; as long as there is clearly no impact on others.

HeatKing installed in the Eco-Home of the future

HeatKing air source heat pumps are being used for a new build project of four Eco-homes being built in West Yorkshire. The Eco homes are being built on the site formerly occupied by the Stones Methodist Church School in Ripponden, a village in the hills of West Yorkshire. The small development of four family houses has been built by Concept Design & Build and is constructed to exceed the building regulations up to the year 2016. As an environmentally conscious project the company said that the sourcing of all materials and elements had been strategic, 'making HeatKing the obvious choice for this perfect demonstration of Eco building for a real family home'.

The homes are constructed from SIPs, an enhanced timber frame system; they are fitted with Argon Gas filled double glazing and have a heat recovery system. The high level of insulation and the use of a heat recovery system resulted in a very small need for conventional heating. However to assist with the pre-heating of domestic hot water a HeatKing BWarm 6000kW air source heat pump was selected. Supplying additional heat through under floor heating on the ground floor the HeatKing unit 'exceeded the specification and as a local manufacturer proved to be an environmentally conscious solution in every way'.

The HeatKing BWarm range is suitable for heating and domestic hot water pre-heating up to 55°C and can, it is claimed, reduce energy costs and carbon emissions by up to 70% when compared with an all-electric system. The units deliver a COP of up to 5 and can operate in temperatures as low as -20°C.

The family homes, each with four bedrooms and three bathrooms have 40% of the carbon footprint of a normal house.



Colt Caloris links with GSHP for Ramada

Colt's Water Refrigerant Flow (WRF) heat pump system, Caloris, has been installed as part of an energy efficient refurbishment at the Ramada Heathrow hotel. It is providing an air source scheme to complement a ground source heat pump system (GSHP) in a hybrid arrangement, and 'was chosen for this reason as well as its low energy, low cost and space saving qualities'.

Colt Caloris WRF units have been installed in all 200 rooms at the hotel as well as 43 ancillary rooms, with two outdoor units linked to GSHP. The hotel's re-development is due for completion later this year.

Caloris offers de-centralised, local control, adjustable by individual room occupants.

Colt Caloris units are connected by a 2 pipe neutral temperature water circuit, 'resulting in a minimal amount of refrigerant charge being used'. This, says the

company, avoids the F-gas regulation and negates the need for a potentially costly refrigerant leak detection system in each room.

Colt is also installing a Caloris system linked to a GSHP system at the Hatchcroft Building at Middlesex University. Caloris systems are also flexible enough to be scaled up: more than 600 units are being supplied to the Exchange Flags complex of office buildings in the heart of Liverpool's expanding commercial district.

www.coltinfo.co.uk



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How to Join:

The HPA is dedicated to the application of heat pump technology and will achieve this goal with the aid of new members joining the already committed companies.

If your company would like to receive information on joining the HPA. Please contact Terry Seward, HPA Secretary.

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The Heat Pump Association is a founder member of the U.K. Heat Pump Network.

Origination and printing by The Advertising Designers, Edenbridge, Kent.

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Attention of

Terry Seward HPA Secretary

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