Building Services News

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Building Services news

BIM upskill so that the

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MITSUBISHI ELECTRIC

CITY MULTI
QAHV Hot Water Heat Pump

For High Volume Hot Water Applications

Introducing QAHV – the latest innovation in Mitsubishi's comprehensive lineup of Hot Water Heat Pump products. QAHV has been specifically designed to produce high volume hot water and is suitable for commercial and industrial applications where hot water demand is high. By adopting Mitsubishi Electric's unique technology, QAHV ensures highly reliable performance as well as high heating capacity even at low outdoor temperatures. Ideal applications include Gyms, Hotels, Motels, Aged Care Facilities, Schools and Universities.

Main Features of QAHV

- Utilises natural refrigerant (CO2)
- High efficiency (Achieved COP 3.88*)
- Supplies high temperature hot water of up to 90°C
- Operable even at low outdoor temperature of -25°C

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Undercurrent of anxiety

Despite the fact that consultants, contractors and suppliers are extremely busy, there is an undercurrent of anxiety prevailing within industry. The year started out on an optimistic high but now, as we exit the third quarter, the outlook for quarter four, and more importantly into 2020, is somewhat overshadowed by uncertainty.

The fiasco that is Brexit is undoubtedly a contributory factor, not to mention the political and constitutional chaos in the UK. The consequences of both do nothing but impact negatively on Ireland.

Global trends are no better. There is the China/US trade war, growing tensions between Japan and Korea, the drone strike on Saudi oil facilities, hyper inflation in Venezuela, etc. As part of the global economy Ireland cannot escape the impact of these negative market forces.

Despite all of this, we're told Ireland is close to "full employment". So, while this anxiety is quite understandable, let's hope it is unfounded.

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NEWS AND PRODUCTS

Public tender process needs overhaul

The majority of construction SMEs don't compete for government tenders because they are essentially excluded from the process due to unnecessary stringent financial requirements, according to the CIF. Currently, SMEs account for 99% of businesses in Ireland but smaller companies deliver less than 33% of public sector projects.

Justin Molloy, CIF Regional Director (pictured) said: "The current procurement system militates against SME involvement in public sector contracts. Very often regional SMEs have the relevant experience, track record and local relationship to deliver the optimum for contracting authorities. However, unrealistic and unnecessarily restrictive prequals and bundling rule them out of public sector projects.

"The government needs to urgently rethink its stance on procurement. SMEs are extremely important to the Irish economy, and to continue to exclude them from securing these contracts is catastrophic for regional economies. A level playing field is needed for all businesses wishing to participate in public tendering."

ATP comes of age

Advanced Technical Products Ltd, the specialist heating and pipeline product suppliers, recently celebrated 18 years in business. David Daly, Managing Director, (pictured) said: "We would like to thank all of our suppliers, friends and particularly our loyal customers for their continued support over the past 18 years."

ATP now employs five people and services customers' needs from the company's recently-refurbished office/warehouse at Blanchardstown Corporate Park. It specialises in the PICV and hot water supply equipment, plus a selection of complementary technical products.

The past 18 years have seen ATP involvement in some very prestigious projects, including the National Convention Centre, The Aviva Stadium and, more recently, One Microsoft Place.

Looking to the future, ATP will shortly offer an online trading facility, which will make ordering standard items and spare parts easy.

Contact: www.atpireland.com

Riello's premix burners

Riello RX premix packaged burners are available in outputs up to 3MW, offering NOx levels of less than 40mg/kWh, with high turndown ratios of up to 8:1. The main differences between traditional pressure jet burners and premix burners relate to the ways in which the air and gas is mixed, and in the technology of the combustion head.

In traditional pressure jet burners, the gas and the combustion air are mixed at the point of ignition on the end of the combustion head in the space available in the combustion chamber (diffusive flame). Riello RX burners feature an exclusive design that includes a patented woven wire gauze "sock" covering the combustion head cylinder. This arrangement enables a very compact flame with a diameter directly related to the burner firing rate, ensuring precise heat control and optimum efficiency at all loads.

The high turndown makes RX burners ideal for systems with variable heat loads where low NOx levels are also required. These range from condensing boilers through to process applications such as spray booths and industrial ovens.

The geometry of the gas ports is designed specifically to ensure that throughout the modulation range the speed of the air/gas mixture is sufficient to avoid burn-back. Also, the high combustion intensity developed on the premix burner head means that a greater heat output is achieved over a much smaller combustion head dimension, when compared to other burner technologies.

RX burners can be used in conjunction with variable speed drive motors to reduce electricity consumption and lower noise levels even further than the typical 30% noise reduction compared to many other combustion applications. Control options include progressive two-stage operation and fully modulating via 0-10V or 4-20 mA. Full electronic control with operational and diagnostic display is also available.

For further information visit www.rielloburners.co.uk

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*We understand a smart-pump as a new category of pumps, which goes far beyond our high-efficiency pumps or pumps with pump intelligence. Only the combination of the latest sensor technology and innovative con-trol functions (e.g. Dynamic Adapt plus and Multi-Flow Adaptation), bidirectional connectivity (e.g. Bluetooth, integrated analogue inputs, binary inputs and outputs, Wilo Net interface), software updates and excellent usability (e.g. thanks to the Setup Guide, the preview principle for predictive navigation and the tried and tested Green Butto Technology) make this pump a smart-pump.

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NEWS AND PRODUCTS

Consider Liquid Biofuels

The Fuel Distributors Association (UKIFDA) continues to seek a meeting with Richard Bruton, TD, Minister for Communications, Climate Action & Environment, to discuss how a pathway to the introduction of liquid biofuels can provide a practical, affordable and effective solution to Ireland's Climate Action Plan objectives.

Nick Hayes, Irish Representative for UKIFDA (left) says: "There are 686,000 households, mainly in rural and off-grid homes in Ireland, that the Government is pushing to change to heat pumps. However, many of these homes need substantial upgrades to their insulation before they would be suitable for heat pumps. Figures of €70,000 to €80,000 have been quoted for a typical deep retrofit on a three-bed semi-detached house. That is a substantial amount of money, even with grant funding.

"At the moment we feel there is a lack of joined up thinking in Government. We feel that adding biofuels into the energy mix for meeting carbon reduction targets, and having a pathway to biofuels, is key in reaching the Government's decarbonisation targets in a way that would also work consumers."

ATC aids Capuchin Day Centre

Declan Donnelly, ATC, presenting Jonathan Smyth with a cheque for the Capuchin Day Centre in Dublin recently. On the right is Paul Martin, CIBSE Ireland. The Capuchin Day Centre is this year's CIBSE Ireland nominated charity and the contribution was raised at ATC's open day.

LPG storage criteria

The National Standards Authority of Ireland (NSAI) is currently holding a period of public enquiry on the following Irish standard: *IS 3213 – Code of practice for storage of LPG cylinders and cartridges – (Edition 2).*

Full details on the revision of this Irish standard and the mechanism for submitting comments are available from the NSAI website (Your Standards, your Say).

See http://www.nsainep.ie/Home/Details/15286

Crown Workspace appoints Phil Oram

Crown Workspace UK and Ireland has appointed Phil Oram as its new Regional Director. Phil will oversee the business' ongoing integration with Premier Workplace Services which it acquired in November 2018. Phil's new role will see him take leadership for the entire Workspace business across the UK and Ireland.

As Regional Director, Phil will focus on leading the expansion of Crown Workspace's service by continuing to drive the sustainability agenda across all services.

Heat pump installation made easier

Having listened to installer suggestions about how it could improve its processes, SEAI has released a new version of the Heat Pump Designer Installer sign-off form.

This is a unified version that will be required for the BER assessor and for the Better Energy Homes Heat Pump System grant, and can be found on the SEAI website under Grants/Support For Contractors: www.seai.ie/grants/supports-for-contractors

This Excel file includes:

- Designer installer sheet sign-off form;
- Heating design sheet;
- Checklists and guidance explaining how to fill this out for BER and grant purposes.

Note that both the *Designer Installer Sign-Off* form and the *Heating Design* form are part of the documentation required for grant payment.

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COMMERCIAL

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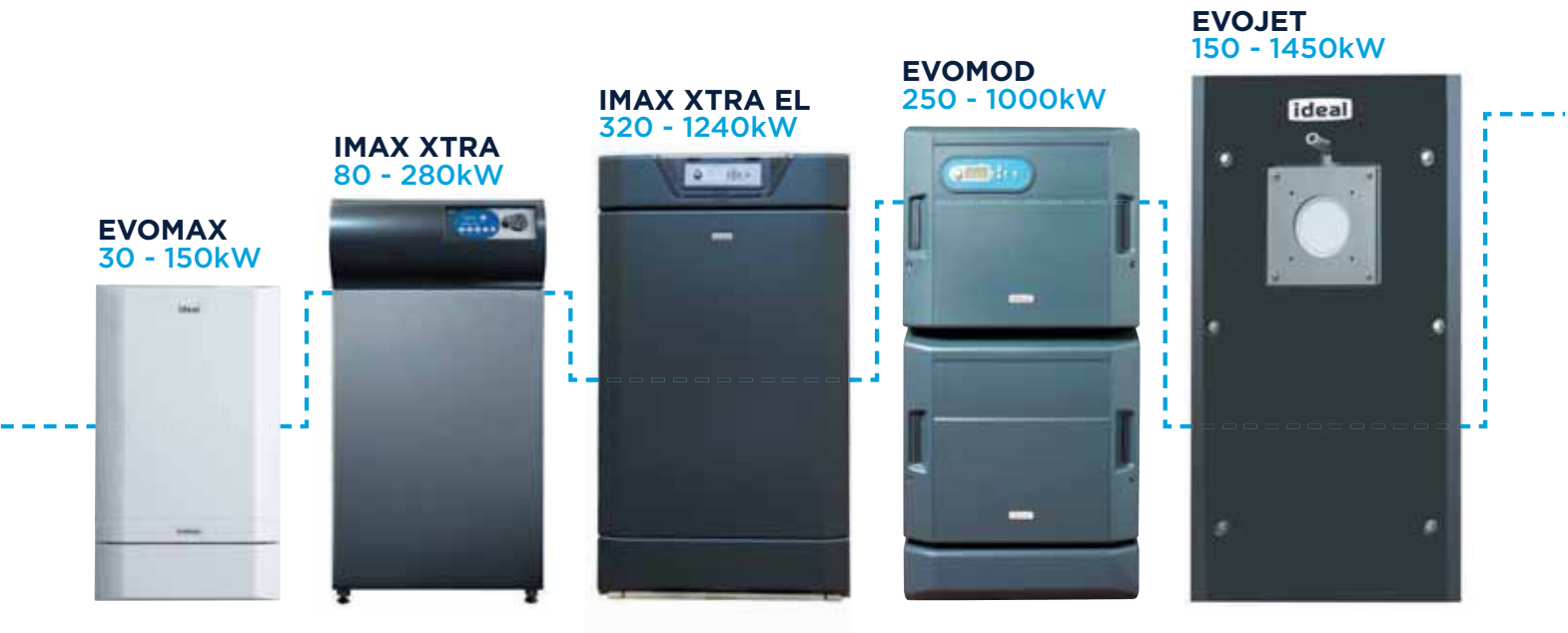

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Building a circular economy to minimise environmental damage

Daikin already provides market-leading energy efficiency and low-carbon solutions, including its newly-launched VRV IV+ range. However, it has now introduced a new, more far-reaching initiative designed to promote and encourage a circular economy in refrigerants.

"Building a circular economy – from procurement and manufacture through to recovery and recycling – is part of Daikin's wider strategy to minimise environmental damage throughout the entire life-cycle of its products," says Liam Kirwan, Senior Sales Engineer, Daikin Ireland.

"The reclamation of refrigerants is essential to this process, so hence the introduction of the Certified Reclaimed Refrigerant Allocation initiative. The objective of this pioneering initiative is to design out waste and pollution, keep products and materials in use, and regenerate natural systems."

Choosing a product with Reclaimed Refrigerant Allocation means clients support the re-use of refrigerant and avoid more than 150,000kg of virgin gas being produced each year. The introduction of Certified Reclaimed Refrigerant into selected VRV units is a core component of Daikin's vision to support the development of a circular economy, and is also part of the company's wider commitment to provide safe and healthy air environments while striving to reduce our direct and indirect CO_2 emissions.

Exclusive to Daikin, the Certified Reclaimed Refrigerant Allocation designation assures customers of both the quality and quantity of the reclaimed refrigerant. Assessed by an independent laboratory, the reclaimed refrigerant is the same quality as virgin refrigerant and meets AHRI700 standards.

An independent audit process also ensures that the reclaimed gas is allocated administratively to 100% of the factory charge of the VRV IV+ heat recovery and VRV IV S-series units produced in Daikin's Ostend factory. This means that these units support the F-gas Regulation by recovery and reclaim within the European Union.

"This is a bold initiative from Daikin," concludes Liam Kirwan, "and one that shows leadership in the drive to create a circular economy in refrigerants."

Right: Liam Kirwan, Senior Sales Engineer, Daikin Ireland.

Striving to become the lowest CO_2 equivalent manufacturer

What does Certified Reclaimed Refrigerant Allocation mean?

External Certified Quality

Reclaimed refrigerant meets AHRI700 certified standards, assessed by an independent laboratory, and so is the same quality as virgin refrigerant.

Reclaimed and reused within Europe

Reclaimed means the refrigerant is regenerated in a high-quality way, in line with the F-gas Regulation definition. This means that units with reclaimed refrigerant support the F-gas Regulation by recovery and reclaim within the European Union.

Certified Allocated Quantity

Virgin and reclaimed refrigerant are used in the Daikin Europe factory. Through an audit process we ensure the reclaimed refrigerant is administratively allocated to the VRV IV+ and Mini VRV factory charge.

Reclaiming R-410A is just the start

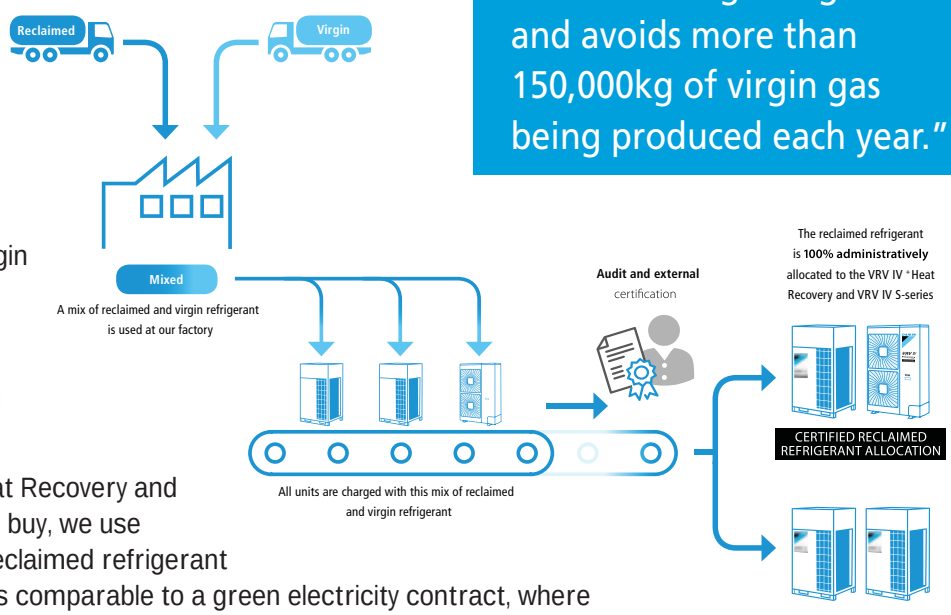
With the huge potential of R-410A available in existing installations, we invite you to join our mission in creating this circular economy. Today for R-410A and for other refrigerants in future.

"Certified Reclaimed Refrigerant Allocation means reusing refrigerant and avoids more than 150,000kg of virgin gas being produced each year."

The Principle

Do these units have 100% reclaimed refrigerant?

No, at the factory reclaimed and virgin gas is mixed and the amount of reclaimed gas is allocated administratively to two product ranges: VRV IV+ Heat Recovery and VRV IV S-series (4, 5, 6 HP).



Meaning that for every VRV IV+ Heat Recovery and VRV IV S-series (4, 5, 6 HP) unit you buy, we use the equivalent amount of certified reclaimed refrigerant to charge units at the factory. This is comparable to a green electricity contract, where you use a mix of conventional as well as renewable produced electricity and the provider allocates administratively 100% renewable produced electricity to your contract.

NEWS AND PRODUCTS

Grafton Merchanting ROI rebrands

Grafton Merchanting ROI is rebranding to Chadwicks Group as part of a €5million investment programme in the business. Over the next three years in-store refurbishments and a technology upgrade will be rolled out at all branches across over 50 locations nationwide.

The first step in the technology overhaul is the migration of all financial and product administration information for customers to a centralised ERP system, meaning customers will have access to their credit from any of its locations nationwide.

Meanwhile, the new-look Chadwicks branches will incorporate new shelving, flooring, signage, counters and layout. To date, seven branches have undergone a refurbishment and eight more branches are planned to be revamped by the end of 2019.

Build2Perform Live

Build2Perform Live is the CIBSE's two-day event featuring 80+ hours of approved CPD, 90+ speakers, 2,000 attendees and 70 exhibitors. It will take place over 26/27 November 2019 at Olympia in London.

CIBSE Build2Perform Live is about making connections – between people, ideas, knowledge and experiences – and gaining insights on issues to enable practical, positive action on building performance.

It is the biggest, most significant two-day interactive event dedicated to helping built environment professionals and the wider supply chain. It offers many interactive features and multiple seminar streams.

For further information see www.build2perform.co.uk

Mitsubishi Electric braves gale-force winds at Portmarnock

While Portmarnock Bernard Langer-designed links course is a magnificent setting and a golfer's dream to play, it is also extremely challenging. However, factor in gale-force winds and you really have your work cut out for you.

That said, the 100 plus participants in the recent Mitsubishi Electric annual golf outing at the club rose to the occasion and returned excellent scores considering the conditions. It helped that the course itself was pristine and the playing surfaces immaculate.

Attempting to get 100 plus golfers out simultaneously with a shotgun start is no easy feat and the incredible attention to detail by the Mitsubishi Electric team meant it all went off like clockwork. From the welcome greeting on arrival through to getting out on the course, and the subsequent meal and presentation of prizes, everything was seamless.

Winning team was FSW while overall individual honours went to Aidan McDonnell.

All in all, it was an excellent occasion thoroughly enjoyed by all. ■

Overall winner Aidan McDonnell receiving his prize from Ciaran Moody, Mitsubishi Electric.

FSW Team: Kevin Roden, Anthony Darby, Jimmy Fitzgerald and Barry Brown.

Joe Warren, second in individual competition, receiving his prize from Ciaran Moody.

Let to right: Robbie Renehan, third in individual competition; Conor Blaney, winner Front 9; Johnny Lynagh, winner Back 9.

Do you remember? …

2017

In 2017 Donald Trump is inaugurated as the 45th President of America with Mike Pence as his Vice-President. His selection as a presidential candidate, and his ultimate election, is surprising and controversial, and his inauguration is marked by extensive protests across America and throughout the world.

Also in 2017, T Bourke acquires Hospital Technical Systems (HTS), a specialist medical gases company. HTS offers design, supply and install of medical gases – along with full maintenance – to the medical, pharma and education facilities sector nationwide. This is the second acquisition in T Bourke's history, the company having previously acquired Limerick-based electrical company, DC Engineering. The T Bourke Group of companies now offers mechanical, electrical and medical services across the entire spectrum of the Irish construction industry.

Established in 1968, today T Bourke is one of Ireland's leading mechanical and electrical contractors. The company has a reputation for high-quality installations with experience across all industry sectors including commercial, process and pharmaceutical.

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Carrier offers «Free Defrost», an innovative defrosting method which can significantly improve the SCOP of the heat pump during positive weather conditions. Compared to a traditional defrosting method, it generates **shorter payback, improved comfort, higher efficiency and reliability** whilst reducing the noise and vibration level, and the environmental impact.

*Comparison between the previous AquaSnap (30RQ) and the new AquaSnap with Greenspeed intelligence (30RQP).
Source: Carrier estimates based on tests & simulations. This information is intended as an example for comparison purposes only.

KEY FEATURES

- **Compact design,** same footprint as previous AquaSnap generation, **"plug and play"** installation thanks to its built-in hydronic module.
- **Acoustic comfort*** : smooth fan speed variation and night-time mode, adjustable sound level on site.
- **Advanced control**: using Greenspeed intelligence, fan speed is adapted to continually optimise the energy efficiency of heat pumps.
- **Partial heat recovery** (Option): to produce free hot water, units can be equipped with one desuperheater on each refrigerant circuit.

*30RQP only.

AquaSnap scroll heat pumps with Greenspeed intelligence

30RQP

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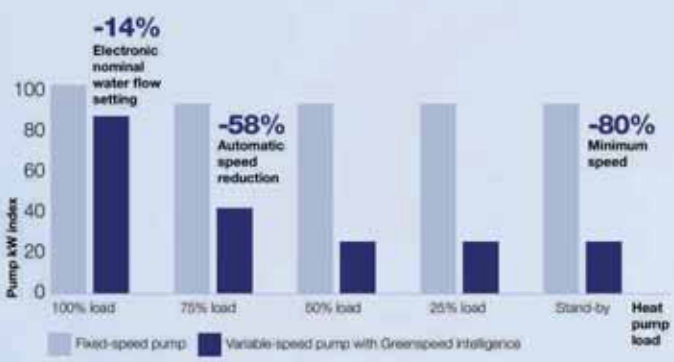
  - fixed-speed
  - variable-speed based on constant pressure or constant temperature

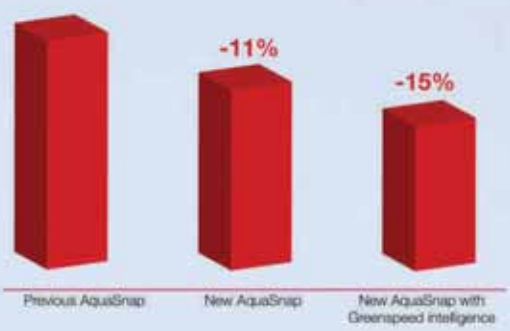
VARIABLE-SPEED PUMP DRIVE

■ **Pumping energy savings**: AquaSnap heat pumps can be equipped with one or two variable-speed pumps to save significant pumping energy costs (up to 2/3) during partial load operation and stand-by periods.



Source: Carrier estimates based on pump affinity law and variable water flow hydraulic system design. This information is intended as an example for comparison purposes only.

■ **Enhanced heat pump energy efficiency** at full and especially at partial load, thus improving the lifetime energy savings.



Source: Carrier estimates based on 15-year energy savings calculations comparing a 400kW AquaSnap heat pump (2,8 SCOP and 3,5 ESEER) of the previous generation to a new AquaSnap unit (3,1 SCOP and 4,0 ESEER), a new AquaSnap with Greenspeed intelligence unit (3,2 SCOP and 4,2 ESEER) at an office building in an average European climate, 3500 running hours and 1000 stand-by hours per year. This information is intended as an example for comparison purposes only.

QAHV hot water heat pump series for high volume hot water applications

As a leading manufacturer of air-to-water heat pumps, Mitsubishi Electric has developed QAHV, the latest innovation in its comprehensive line-up of hot water heat pump products. QAHV has been specifically designed to produce high volume hot water and is suitable for commercial and industrial applications where hot water demand is high. It operates on CO2 (R744) as it is an environmentally-friendly, natural refrigerant which has zero ozone depletion potential (ODP) and has a global warming potential (GWP) of 1.

By adopting Mitsubishi Electric's unique technology, QAHV ensures highly reliable performance as well as high heating capacity, even at low outdoor temperatures. Applications include gyms, hotels, motels, nursing homes, schools, universities, etc.

Unique to Mitsubishi Electric, QAHV utilises a twisted and spiral gas cooler. Using twisted pipes as water pipes and running the refrigerant pipes along their grooves helps to increase the heat-conductive area. This allows for better heat transfer and an impressive COP of 3.88 (under normal heating conditions at outdoor temp of 16°CDB/12°CWB, inlet water temp 17°C, outlet water temp 65°C).

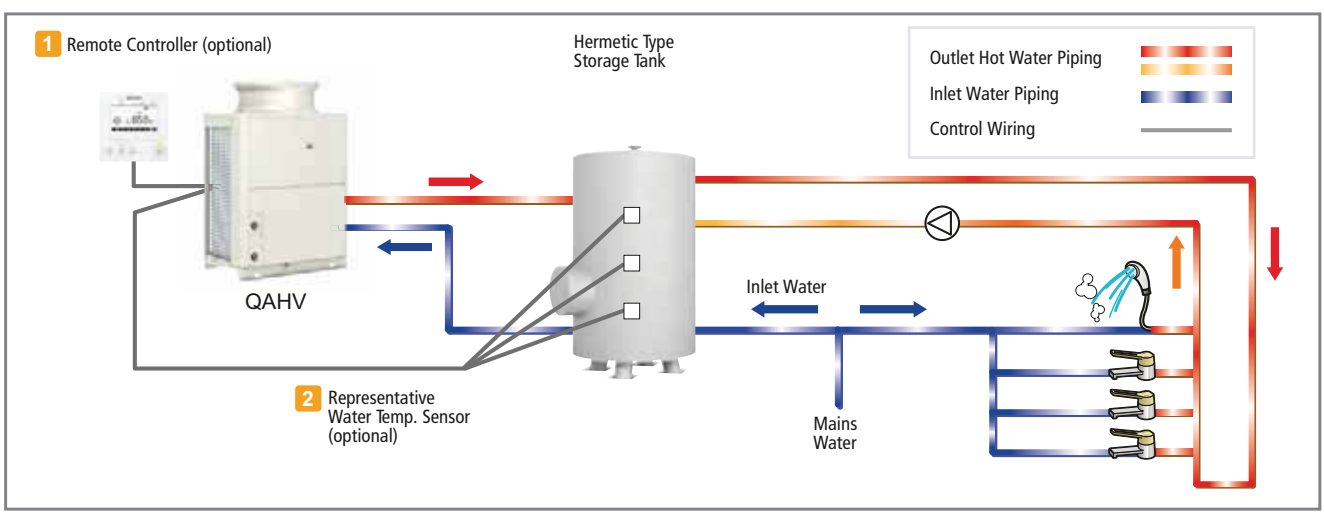
The continuous spiral groove design accelerates the turbulence effect of water and helps to reduce pressure loss within the heat exchanger, enhancing efficiency. Equipped with the latest inverter scroll compressor, QAHV offers unparalleled efficiency when compared to fixed speed systems.

Features of QAHV

- Utilises natural refrigerant (CO2);
- High efficiency (Achieved COP 3.88);
- Supplies high-temperature hot water of up to 90°C;
- Operable even at low outdoor temperature of -25°C.

QAHV delivers its full heating capacity of 40kW, even at ambient temperatures as low as -3°C. Furthermore, the unit operates to supply 90°C hot water in ambient temperatures as low as -25°C. This superior level of performance is achieved using Mitsubishi Electric's industry-first "Flash Injection Circuit" which provides the optimum amount of refrigerant to the system via a compressor through a specially-designed injection port. This guarantees highly-stable operation.

Contact: Dave McConnell, Sales Manager Heating Products, Mitsubishi Electric.Tel: 01 – 419 8800; email: dave.mcconnell@meir.mnee.com



QAHV system schematic image.

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Panasonic ECOi-W

A new era in heat pump chillers

ECOi-W, the new heat pump chiller series recently added to the Panasonic Heating and Cooling portfolio, offers a wide choice of reliable and powerful HVAC chiller solutions to meet the needs of hotel, commercial and industrial applications.

Available in a range of sizes offering heating and cooling capacities from 20kW to 210kW and with outstanding energy-efficiency, the new ECOi-W heat pump chiller series has high SEER/SCOP values – average SEER of 3.85 and SCOP 3.32. With guaranteed quiet operation for comfort and a compact footprint, the series is designed and optimised for easy service and maintenance.

Not compromising on product quality, Panasonic's new heat pump chiller range comes fully equipped with high-quality components such as special defrost limiting coils, low-noise kits and Blue Fin anti-corrosion coating as standard.

The entire range is cloud-compatible for easy usage and convenient remote control and maintenance, helping to prevent breakdowns and optimising costs. For sizes 140-210kW, the cloud comes as standard. It also seamlessly interfaces with established building management (BMS) and VRF systems for effective monitoring, and streamlined reporting and management.

Benefits

- High seasonal efficiency: Average SEER of 3.85 and SCOP of 3.32;
- Reliable quality components;
- Quiet comfort with low noise operation;
- Fully customisable design.

Specific solutions can be tailored to individual customer requirements by selecting the most suitable specification from Panasonic's full range of heat pump chillers, such as ambient options, pump type and hydraulic options. This flexible approach ensures the series is the perfect solution for hotels, offices and industrial buildings with very specific or unusual requirements. The ECOi-W series provides optimal performance in any climatic condition. It operates in heating mode at outdoor temperatures as low as -17°C and in cooling mode at outdoor temperatures up to 50°C. Thanks to a defrost-limiting coil design, a maximum 15% higher COP is achieved when compared to a standard coil. Each pair of coils can be defrosted while the other pair of coils are running in heating mode. This alternated defrost cycle ensures stable hot water, even at low ambient temperatures. The maximum water outlet temperature range for heating is 50°C and 55°C for sizes 140-210kW.

Although the series is cloud compatible, each individual model is fitted with a simple, user-friendly control panel which includes an intelligent logic device for inlet water temperature, automatic test operation and night setback operation. This helps reduce electrical consumption and noise, making it perfect for hotels.

In line with the release of the ECOi-W series, a complete catalogue has been created detailing all the necessary information required for this new innovative HVAC solution.

Contact: Vincent Mahony, Ireland Sales Manager, Panasonic. Tel: 087 – 969 4221; email: vincent.mahony@eu.panasonic.com

The new Panasonic ECOi-W

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Commercial heating – achieving energy efficient design

With a growing range of commercial condensing boilers to choose from, *James Porter, Sales Director at Euro Gas*, identifies key factors that will help achieve good design for long-term, quality heating performance.

As environmental legislation tightens, a continued focus on improving building energy performance is essential to meet the more stringent targets. One practical opportunity for improved efficiency lies with boilers. Commercial boilers are the heartbeat of many non-domestic buildings. Whether the sole provider of heat or operating in a hybrid system with renewable or low-carbon heating equipment, ensuring that they operate efficiently is a priority.

Replacing any ageing or inefficient non-condensing boiler plant with high-efficiency condensing boilers and adding the appropriate controls is widely acknowledged to be one of the most cost-effective means of achieving significant energy and emission savings. At the same time, this relatively simple solution can dramatically increase comfort levels while also improving occupant wellbeing.

But a boiler replacement cannot be regarded as a mere quick fix if the plant is to continue to operate efficiently throughout its lifecycle. Good design is essential, with boiler reliability, future ease of maintenance and part replacement all factors that should be considered from the outset. One flexible and energy-efficient solution to high-performance heating, especially in buildings with fluctuating heat demand, is to opt for a modular boiler design.

Modular boiler design

Essentially, a modular boiler arrangement enables a whole design to be broken down into smaller parts or sections for easier integration and improved efficiency. Historically, larger-output boilers would be specified to meet a high heat demand. This was due in part to a limited choice of boilers, but also to combat poor insulation, infiltration losses and general inefficiencies in the system.

Today, manufacturers offer a wide selection of heat outputs in both wall-hung and floor-standing models to help avoid oversizing. The advantages of spreading the heat load across multiple full-modulating condensing boilers are many.

Firstly, it increases the turndown ratio, enabling the boilers to match the heat demand more accurately. This in turn prevents on/off cycling, ensuring more efficient energy use. A multi-boiler design will also provide improved reliability and more straightforward, non-disruptive maintenance as, even if one of the boilers is offline, the service will continue uninterrupted.

Good boiler selection

While every building has its own unique requirements, space and capital costs are two frequent challenges when it comes to refurbishment. So, how does a modular boiler design help overcome these particular issues?

The compact design of modern condensing boilers and their ability to be installed in modular configuration enables large outputs to be installed in a tiny footprint, as well as in hard-to-reach areas. A further benefit is that the smaller, more lightweight units can be manoeuvred into position more easily and more safely, reducing installation time and costs.

With modular configurations – be they floor-standing or stacking – "island" installations are eliminated in favour of more space-efficient plant placement. In addition, access for servicing and maintenance, and for disassembly at end of plant lifecycle, is simple.

Boilers like the Remeha floor-standing range, for example, are designed to fit through standard doorways and lifts, with integral wheels for easier manoeuvrability. Some higher-output boilers can be disassembled into parts, a feature that can smooth access constraints and help avoid associated costs such as the need for cranes. These same design aspects enable the plant to be removed safely from the building at the end of its lifecycle.

But maintenance areas, access space and walkways also need to be calculated when determining boiler selection. With that in mind, let's consider the options.

Weighing up the options

Modular boiler arrangements can normally be separated into two categories – stacking and floor-standing.

Stacking units are designed to be positioned vertically. Typically, a stack of around six to nine modules, usually combined using a vertical header at the rear, will achieve the required output.

A key advantage of vertical stacking-style arrangements is their ability to offer a larger heat output in a smaller physical footprint. However, as these arrangements require access on all sides of the plant and pipework arrangement, this generally results in the units being "islanded" in the plant room. The vertical headers will also need careful attention to ensure that the boiler pumps, system pumps and overall hydronics are set up to perform as intended.

Floor-standing modular configurations occupy a similar footprint in terms of plant, but access is usually only required at the front. As a result, they can achieve an equally, if not more compact, configuration overall.

This comparison of the two design configurations assumes an approximate load of 900kW (+/- 10%) across three modules.

A typical three-module vertical stacking arrangement would give the following dimensions – 900kW: 2400mm H x 1540mm W x 4300mm L. This design would therefore require a total of 6.5m^2 of plant space once clearance is added.

A typical floor-standing arrangement would give us the following – 900kW: 2300mm H x 1900mm W x 2600mm L. Factoring in the clearance would require a total of 4.9m^2 of plant space.

Whole-life costing

Let's now consider the implications of the two arrangements from a whole-life costing perspective. Multi-boiler, floor-standing configurations will typically require fewer modules to match the heat load, so maintenance and servicing costs will be correspondingly lower across the lifecycle of the boilers. While interconnecting pipework tends to be placed above the units at a similar height to a vertical-stacking arrangement, the modules are all at the same height. This means that maintenance can be carried out safely at a lower level.

Efficiency starts with the boilers

When it comes to heating, efficiency arguably starts with the boiler. It follows, therefore, that quality and performance should be the top criteria when it comes to boiler selection. At the same time, factoring in ease of maintenance, servicing and boiler disassembly, as well as installation, at the design stage will help ensure high efficiencies throughout the boiler's lifetime.

Modular boiler designs provide a time-saving, energy-efficient solution to meeting heating requirements in restricted plant rooms. With suppliers like Euro Gas helping consultants and contractors evaluate the various options, we can work towards achieving the best, most appropriate and energy-efficient commercial heating solution in every building, every time.

Contact: James Porter, Sales Director,
Euro Gas. Tel: 01 – 286 8244;
email: sales@eurogas.ie; www.eurogas.ie

The ability of modern boiiers to be installed in modular configuration enables large outputs to be installed in a tiny footprint, as well as in hard-to-reach areas.

COVER STORY

BIMcert calls for BIM upskilling so that FINIS CORONAT OPUS

BIM is a key part of the fourth revolution (digitalisation) of the AEC industry and an enabling tool for a cleaner and more sustainable built environment. This has been recognised by the European commission and a number of H2020-funded projects – including BIMcert – are focused on providing training frameworks and support to upskill the industry. The BIMcert partners are Belfast Met, CITB, Future Analytics, Technological University Dublin (TU), IST/CERIS Portugal, IECE Macedonia and EIHP Croatia. Here *Paul McCormack the BIMcert Programme Manager and Innovation Manager at Belfast Met,* gives a summarised insight on how BIM can effectively achieve sustainability and energy efficiency goals and targets, and why upskilling the industry is a key requirement.

What is BIM?

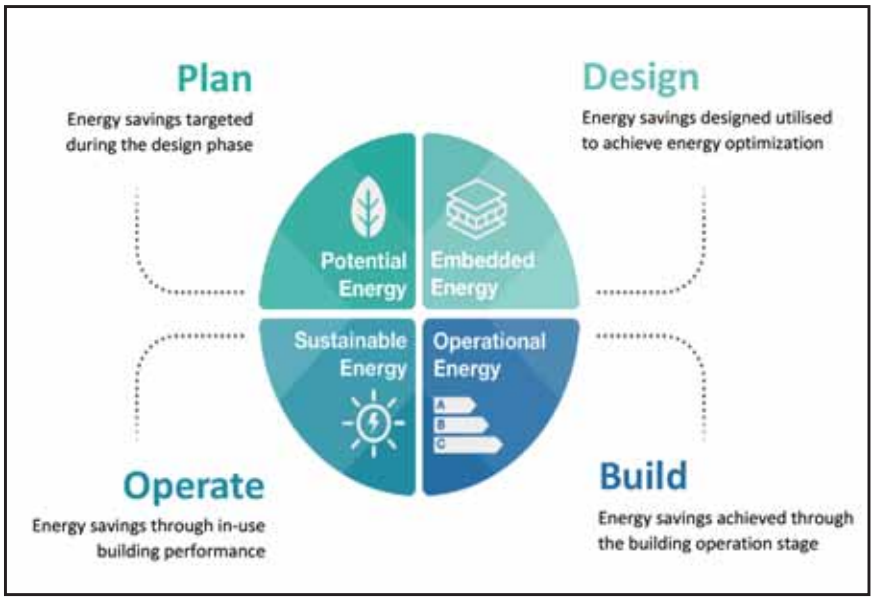
Although increasingly more adopted and recognised by the industry, there are still some who do not fully understand or recognise the significance of BIM. For those, a simplified explanation is: "BIM is a process for creating and managing information on a construction project across the project lifecycle. One of the key outputs of this process is the Building Information Model, the digital description of every aspect of the built asset …"

Building Information Modelling (BIM) is a method based in modern digital technology, mainly a 3D model data-enriched twin, and an associated set of auxiliary tools and processes that can, among other things, be used to support sustainability trends in the construction sector.

Why BIM upskilling is required?

There are increasing requirements for energy efficiency competencies and applicable skills resulting from European de-carbonisation and long-term sustainable energy strategies.

Therefore, solving the problem of skills development for sustainable energy and stimulating demand for sustainable construction and a skilled energy workforce is closely connected to the upgrading of the BIM skills of construction professionals.



Using BIM to manage the Energy Cycle in construction.

As a sustainable energy supportive technology, BIM is a vital tool for reducing the carbon footprint in the construction sector. BIM is the backbone of the new "informed" way of working in the construction sector, triggered and targeted by digitisation and equipped to manage the "full energy content" of construction.

Such is the impact of BIM that the European Commission has supported, promoted and developed several policies and initiatives aiming to foster digitalisation in the construction sector. These include *inter alia* the Strategy for the Sustainable Competitiveness of the Construction Sector and its Enterprises (2012); the EU BIM Task Group; and the upcoming EU Digital Construction Platform.

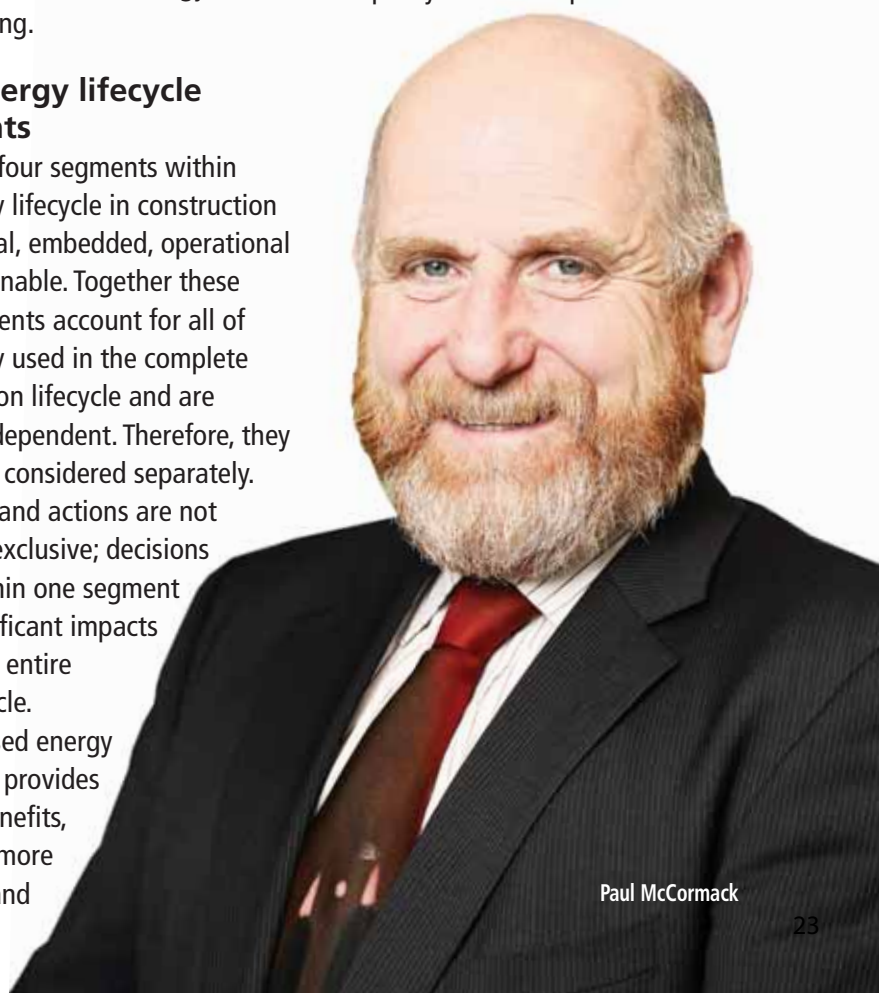
Digitisation and the use of BIM in the construction sector is in its infancy in some regions but the digital journey utilising BIM will generate usages and breakthroughs in the knowledge, use, and results achieved through the deployment of sustainable energy skills. Now is the time for the implementation of digitisation in the construction sector to proactively and effectively reduce the carbon footprint and environmental impact of construction. BIM provides the data for a building's energy consumption. This data can then be used as information to make informed decisions on how best to manage the entire energy circle of a building.

Four energy lifecycle segments

There are four segments within the energy lifecycle in construction – potential, embedded, operational and sustainable. Together these four segments account for all of the energy used in the complete construction lifecycle and are mutually dependent. Therefore, they cannot be considered separately. Decisions and actions are not mutually exclusive; decisions made within one segment have significant impacts across the entire energy circle.

BIM-based energy modelling provides several benefits, including more accurate and complete energy performance analysis in early design stages, improved lifecycle cost analysis, and more opportunities for monitoring actual building performance during the operation phase. Here we look at the four energy lifecycle segments in more detail.

Energy savings are planned and targeted during the design phase, the objective being to proactively utilise BIM tools to reduce the gap between predicted and actual building performance. BIM can be used to model buildings and sequentially perform multiple analysis, enabling energy performance prediction that can be applied to compare design alternatives. This makes for an improved final decision as it involves using BIM as an enabler of effective collaboration between design disciplines. This reduces performance disparity from conception.



Paul McCormack

The BIM collaboration method and tools allow for a more efficient coordination, avoiding errors and therefore leading to a more efficient construction phase, less wastage and contributing to decarbonisation in the construction phase.

BIM software, based on the 3D data-enriched model, allows for simulations as solar paths, solar gains, thermal behaviour and the testing of M&E systems. These, allied to other digital technologies such as cloud computing and AI and machine-learning, are already – and will increasingly – allow testing and evaluation of several design options until the best solution is arrived at.

The design stage will improve as BIM allows for a better-informed decision-making by cataloguing and predicting more accurately – with a data-based process – the future behaviour of the building.

BIM tools, enriched with the correct input data, allow for model analysis to calculate and graphically visualise/represent the loads and performance of the building. They also make for easier, clear and more direct interpretation and understanding of design choices and changes on the impact of building performance.

BIM tools facilitate quantification (5D) which, allied with simulation tools, permits a better-informed cost versus performance ratio comparison. That makes for informed decisions about the feasibility of design options, as well as facilitating the comparison of the predictable energy savings and linked cost saving during the operation phase against the investment required in the construction phase. This is of key importance to illustrate that sustainability and energy efficiency are not only environmentally necessary, but that they can also be profitable.

BIM involves a full lifecycle approach in the AEC industry. The model is a digital twin of the build asset, and BIM simulation tools allow the designer establish – from the inception/design phase – a roadmap for the most efficient way to run the building in the future.

BIM is recognised as a tool to support the visualisation of a building's energy performance, and to sequence and schedule construction towards the application of sustainable construction materials and techniques, with minimum waste of energy and materials. Using the BIM 4D tools (time scheduling simulation) and 5D (quantification), these enhanced digital tools allow a more efficient project management in the construction phase, coordinating the works better, reducing construction time, avoiding clashes, and planning of delivery of materials to site.

Using the 3D BIM model integrated with VR and AR technologies, site-work can become more efficient and faster.

BIM-based digital design and visualisation permit the better use, planning and site delivery of pre-fabrication. In addition, data-rich BIM product catalogues can justify and enable an increased use of local materials.

The use of digital scanning combined with the BIM process integrates different digital data inputs and outputs into new digital workflows applied to construction. For example, in the case of an existing building, a digital survey allows for the measurement of key hotspots requiring energy efficient improvements. BIM design can help simulate and predict how to improve these, and how to implement them during the construction phase. During and after construction this can be re-measured re-using the digital scanning techniques and comparing the BIM model data to verify and reduce the gap between predicted design performance and built performance.

Energy savings achieved through the building operation stage are monitored and managed continually with lessons learned fed back to design teams for future projects. The practicality of implementing BIM is evident as it assists performance management through effective data management in building operations by supporting the interlinking of data environments (BIM supported Energy Management System of Buildings). Effective energy management reduces energy consumed while

» BIM is a tool. BIM is only an enabler. Digital environment is a medium. It is people, the professionals within the industry, who can make and implement the change.

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maintaining occupants' health, safety and comfort conditions.

BIM is utilised to improve existing processes aimed towards sustainable usage of energy. Smart buildings and smart buildings' usage are combined. Digital sensors and the meters platform are compiled within the building's BIM digital model. The engagement of wider public stakeholders (occupants and users) into a standard action of improving buildings' energy performance is essential.

Connected with the three phases already covered (potential, embedded, operational), BIM is a potential method to enable an easier way of achieving energy savings through the lifetime of the building. Smart decisions made in the early design stage of construction, including the selection of materials with high recyclability and least carbon footprint when demolished, are part of not only reducing the embedded energy content of a building (construction), but make buildings more sustainable (re-use of materials).

BIM as a tool closing the loop of energy and materials in a building lifecycle is the target – *finis coronat opus* (the end crowns the work).

Energy for demolition or recycle reuse is a constitutive part of the lifecycle energy of a building and, although in less amount, can still have a significant contribution to the overall environmental performance. All materials and products, especially those with high insulation properties, may require substantial energy and carbon effects for recycling or disposal. EPDs (environmental product declarations) of building envelope materials are incorporated as non-graphic information in the BIM model and used by various stakeholders and professionals in the supply chain.

In the near future, BIM models – with the help of AI prediction – can integrate future-use and re-use into the design of a building, allowing easier changes of use and refurbishment processes, and reducing the energy requirements for demolition and material use connected with new builds.

A vast building stock already exists and BIM can be used to analyse and find effective and feasible ways to re-use those buildings without the need of new builds. Simulation of energy performance using digital technology – BIM models and simulation – can further help justify with evidenced-based factual data, the use of renewable energy systems, convincing the most sceptical and enabling further implementation.

Conclusion

As we move forward, there is a need for construction techniques, policy formulation and policy implementation to be integrated into a balanced and coherent system delivering sustainability across the entire construction supply chain. In the EU's, *Energy Roadmap 2050,* BIM is the most effective supportive technology available to deliver for sustainable energy, to reduce carbon footprint, and to increase the energy efficiency in the construction sector.

However, BIM is a tool. BIM is only an enabler. Digital environment is a medium. It is people, the professionals within the industry, who can make and implement the change. A tool is only as good as its operator.

Considering the importance of digitalisation and, within it, the role of BIM as the new *modus operandi* of the AEC industry, upskilling the industry professional operating in this new reality is paramount. The challenge now lies in how to integrate this upskilling within the current academic offering which, in any case, is not necessarily a suitable pathway in the first instance.

The H2020 BIMcert Project is working towards offering a suitable solution. It is developing a learning framework and associated material based on a system-thinking approach, which will deliver better results in energy efficiency than traditional methods.

It is a holistic methodological approach, based in training the industry from the ground up. The training will be broken down into bite-sized information in order to facilitate progressive upskilling and will be delivered via blended methods, further facilitating the adoption by professionals and SMEs that operate in an already time-poor and budget-tight context.

For more information visit: https://energybimcert.eu/ ■

RACGS GOLF

Captain's Day at Druids Glen

Winner Back 9: Ger Darcy receiving his prize from RACGS Captain Fergus Daly.

As ever, the sun shone brightly – literally – on Fergus Daly for his RACGS Captain's Day in Druids Glen. It was like a mid-Summer's day with the course, which some regard as a true classic parkland example, in magnificent condition. It has hosted the Irish Open so it was hardly surprising that, for the first time ever in the RACGS' history, the outing was over-subscribed with quite a number of would-be participants disappointed. Sponsor was RSL Ireland and the results weare as follows:

Overall winner
Joe Warren, H12, 34pts.

Class 1
First: Darren Keane, H10, 32pts;
Second: Liam Carroll, H14, 29pts.

Class 2
First: Martin Buggy, H15, 31pts;
Second: Billy Qually, H17, 31pts.

Front 9: Dave Burke

Back 9: Ger Darcy

Longest Drive: Darran Keane

Nearest the Pin: Jack Elstead

Visitors prize: Eamon Buggy

Next outing: Friday, 18 October. Venue: Seapoint Golf Club, Co Louth.

Class 1 winner Darren Keane with RACGS Captain Fergus Daly.

Class 2 winner Martin Buggy with RACGS Captain Fergus Daly.

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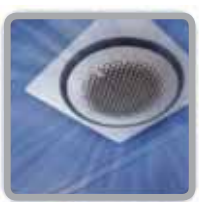

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Variable speed cold water boosters for a green future

The consumption of energy within residential, commercial and industrial settings is the subject of ever-increasing scrutiny. Many businesses and homeowners rely on a water booster set to pump water throughout expansive or multi-storey buildings but traditional booster sets work at a fixed speed, meaning the level of energy consumed remains the same even when the demand for water is low. Here, Kevin Devine, General Sales Manager, Xylem Water Solutions Ireland, explains how a variable speed cold water booster could be a better option for promoting a greener future.

A pressure booster system maintains the required domestic water flow and pressure throughout an entire building. However, as cities become more heavily populated, buildings are getting higher and the demand placed on pressurised water supplies is increasing.

In an attempt to reduce leakage, pressures have been dropped at reservoirs but millions of litres of water are still being wasted. This means it is less about supply and more about improving how water is transported around a building in order to meet user needs, and in an environmentally friendly way. Legally, water companies have to supply a minimum water pressure of 1 bar but, in an ideal situation, this would actually be 6 bar. This is where a booster set can help to ensure that those accessing water at higher points of a building don't lose pressure.

The benefits

There are many reasons why installers choose a variable speed option. However, the key benefit is that large energy savings can be made compared to a fixed-speed system. Over 85% of the lifecycle cost of a pump is through energy consumption so, reducing this is vital to minimise electricity costs, carbon emissions and environmental impact. Water consumption is not uniform during the day in a building, so a variable speed solution that meets these demand fluctuations, rather than staying at constant, will deliver great energy reductions.

According to the Third Affinity Law, a 20% reduction in pump speed reduces the energy consumption of the pump motor by nearly 50%. These savings are possible because of the fundamental rules for centrifugal pumps – the reduction of the speed provides a lowering of the flow according to the linear function, a reduction of the head according to a quadratic function, and a reduction of the power consumption according to a cubic function. Compared with other common control systems like bypass valves, reduction valves or interrupted operation, the speed reduction provides significant energy savings at partial load.

Size is another benefit. Fixed-speed booster sets consist of large storage pressure tanks, which take up a lot of space. However, only small vessels

are required to help provide a positive pressure for the electronics to work against. This space-saving aspect is attractive for those building residential or commercial properties in already-restricted areas, as the variable speed booster set can be installed in smaller areas, such as under the stairs.

A variable speed booster also offers a soft-start function, which is much kinder on the system fittings and pipework, reducing the risk of water hammer and in turn decreasing maintenance costs. Water hammer can occur during the stopping of a fixed-speed pump, whereby the fluid velocity in pipe systems suddenly changes. This damages the pipework and will reduce the lifetime of a system. However, the soft-start-and-stop of a speed-controlled pump, which is much like turning a tap on gradually, avoids pressure peaks and prevents pipe fractures.

In addition, should the power supply fail, occupiers of the building will continue to use what water they can, without realising there is a failure. However, when the power comes back on, a constant speed pump would normally register the low pressure and speed up to full to get to its set-point. This creates a pressure surge that can cause the pipes to break. With a variable speed solution, the gentle start-up and pipe-filling function minimises this risk.

Getting started: Sizing

When sizing a booster set, there are a number of factors to consider, such as building type, plumbing fixture type and friction losses in the piping system and equipment.

Building type – Considering the building type is important as the usage patterns and the types of appliances being operated vary greatly. For example, in a school, it is unlikely that every toilet or tap will be in use at the same time, but in a sport stadium this will be common during the intervals. Therefore, each case will need to be looked at in its own right, and assessed accordingly when sizing.

Plumbing fixture type – The plumbing fixture type will also need to be looked at as different fixtures have different flow and pressure requirements. It is therefore important that engineers check the local plumbing regulations for fixture flow requirements.

Friction losses – As flow decreases, friction losses in the piping system also decrease. Constant-speed pressure boosters cannot take this into account, which is why a variable speed booster is ideal because the drive will accommodate fluctuations in demand.

Next steps: Selection

When selecting a booster set, there are also a number of things that need to be considered. For example, it's important to know the flow rate required, the head required for this flow rate, the booster set location, the application and also what BMS (Building Management System) is being used.

Flow rate – The current standard for calculating flow requirement is BS EN 806-3-2006. Using this specification, you can work out the loading unit and flow value for different appliances. For example, a washing machine is rated at two loading units, whereas a hand-basin is one loading unit. Once you have added the loading units of all the necessary appliances together, there is a graph within the standard that can be used to obtain the diversity factor. By reading from the chart, you can equate this loading unit to the required flow rate.

Head requirement – In order to work out the total head requirement, you must add the static lift, residual pressure and friction losses together. The discharge pipe should be sized using a velocity of approximately 2.5m/s. Once the flow rate has been calculated, pipework sizes can be ascertained using the accepted velocity. Friction losses can then be calculated using the flow rate and pipe size.

Booster set location – The location of the plant room is particularly important in relation to the break tanks. This will determine the head available at the pump suction, enabling the correct selection to be made without the danger of cavitation. It should also be located away from accommodation areas to reduce any noise and disturbance. Where this is not an option, anti-vibration kits should be used to reduce the structural transmission of noise.

Application – Power and water supply can be critical to some applications, such as hospitals, so a fail-safe solution is vital. If this cannot be guaranteed, the use of diesel drive pumps and roof-level storage should be considered.

In addition, ideally all variable speed pumps should also have their own independent inverter complete with their own transducer. This ensures that if an inverter fails the variable speed control is not lost and the set continues to operate as a variable speed pump set.

For sets with only one inverter, if it fails, the set either stops completely or operates as fixed speed only. Likewise, some pump sets have inverters on all pumps but only one transducer. Again, if the transducer fails the pump set is out of action.

Communication – Most variable speed products have communication capabilities enabling the pump set to talk to a Building Management System (BMS). For the BMS system to understand the language of the pump set that it is talking to, the protocol of the BMS and the pump set has to match. There are many different protocols so it is important to make sure the variable speed drives chosen have the same protocol as the BMS they are connecting to. Otherwise, a gateway will need adding to convert from one protocol to another.

Finally, when the above has been assessed and the details of the water requirements considered, then the booster set can be selected. Depending on the importance of supply you may wish to have a duty and standby pump to give 100% back-up, or the duty may be split into three pumps with standby, for example: 3 x 50% pumps, meaning that if one fails, you will still have a 100% duty available. Where the supply is not so critical it may be more cost-effective to have a duty-assist pump, sized to 50/60% of duty. ■

Quality System Solutions for commercial and large-scale domestic boiler projects

C&F Quadrant is a member of the Linders of Smithfield Group of companies and is a major supplier of internationally-renowned heating and plumbing brands catering for the commercial and domestic heating markets. With offices in Dublin and Belfast, and a network of regional representatives and merchant trading partners, comprehensive all-Ireland coverage is assured.

With a pedigree stretching back over 40 years' service to the heating industry, C&F Quadrant delivers quality products and system solutions.

C&F Quadrant office and warehouse headquarters in Dublin

Complementing its extensive product portfolio is a team of highly-qualified, engineering-led, personnel right through from sales to after-sales support. Products are also listed on the SEAI Triple E Register which qualifies for Accelerated Capital Allowances, while BIM files are also available.

C&F Quadrant also delivers courses on commercial and domestic heating products, together with CPD presentations, at its own training facility or at client premises.

Brief brand details are as follows:

ACV – whose speciality is stainless steel – has been designing, manufacturing and distributing engineering solutions for hot water generation for commercial and residential heating applications since 1922. Included in the portfolio are:

Prestige wall-hung gas condensing boilers with stainless steel heat exchangers. Available in 50kW, 75kW, 100kW, 120kW models, along with cascade options up to 720kW;

Heatmaster gas-fired condensing combined boiler and water heater – 25 to 120TC models available.

See www.acv.com for further details and information on the full product range.

BOSCH Bosch is a leading manufacturer of energy-efficient heating products and hot water solutions with proven experience in commercial, district and industrial applications.

The expansive product range includes wall-hung boilers (GB162 range); heat interface units; floor-standing stainless steel (GB402 range); and cast iron boilers (GE515/615 range).

See www.bosch-thermotechnology.com/gb/en/commercial-industrial/home/

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See www.coster.info for details.

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For over 40 years Flamefast has been manufacturing and supplying high-quality, cost-effective gas safety solutions. These include: **GasGuard** – Gas-proving and ventilation interlock for kitchens and classrooms; **VentGuard Plus** – Ventilation interlock with integrated fan current monitor; **CO2, VOC, Temp and RH Transmitter (CO2T)** – Relay and 3 x 0-10V outputs as standard with optional traffic light LED; **Gas Monitor** – 16-channel gas monitor panel for laboratories and plant rooms; **Flamefast Gas Sensor** – Available for a wide range of gases including natural gas, CO and O2.

See www.flamefast-gas-safety.co.uk for details.

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Unical's professional range of products includes medium and high-power gas and oil boilers, heating units, modular heating units and cascade systems for indoor and outdoor applications. These products are distinguished by low NOx emissions and power ratings of up to 7000Kw. The Modulex range of aluminium condensing boilers has 4-star efficiency class and low NOx levels. Modulex units can be installed practically anywhere, are compact in size and provide power ratings of up to 900 kW. In addition to boilers, Unical's catalogue also includes housing modules for centralised heating systems, zone satellites, energy meter accessories, thermostats and cascade controllers. There are also primary rings, hydraulic separators, modulating pumps and hot water tanks.

See www.unicalboiler.com for details.

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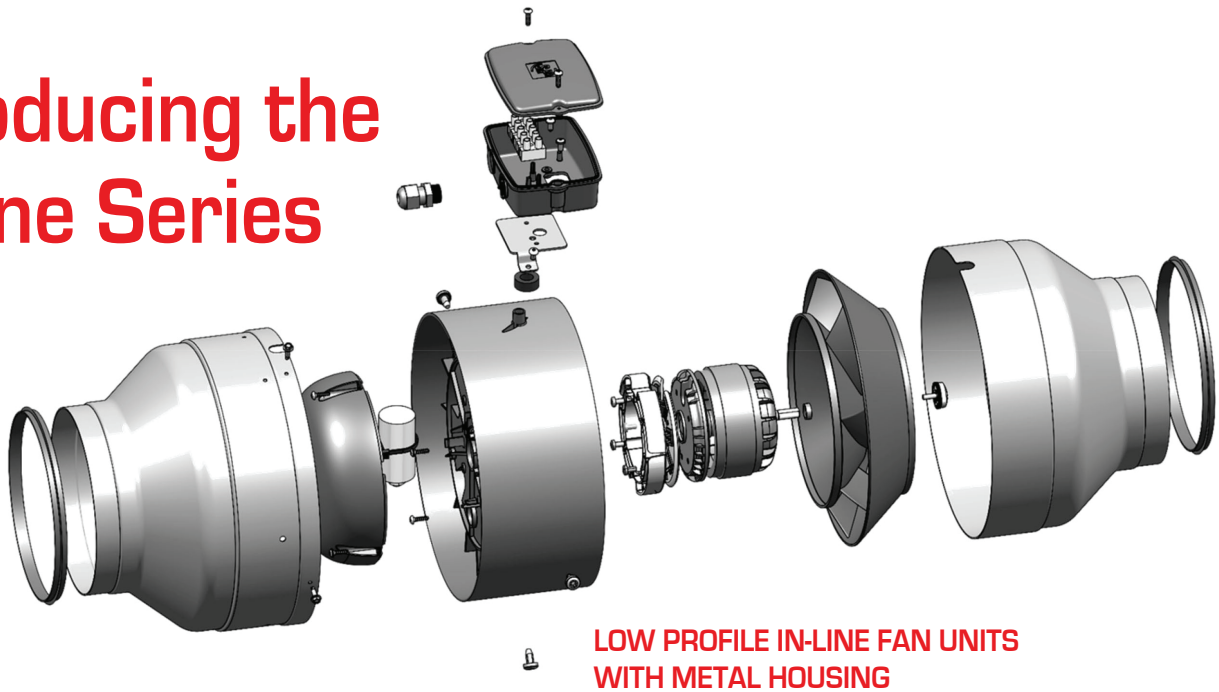
See www.vaillant.co.uk/commercial/ for details.

Jetline Series latest addition to low-profile, in-line fan portfolio

Introducing the Jetline Series



S&P Ireland has a solution for every specific ventilation need, and its in-line duct fans offer an efficient and low-noise choice for residential, commercial and industrial applications. Incorporating cutting-edge technology and innovative designs, the new Jetline Series is the latest addition to the portfolio. Full details of the design features and benefits that this advanced range offers are outlined here.

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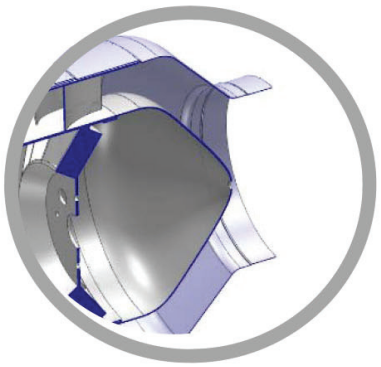

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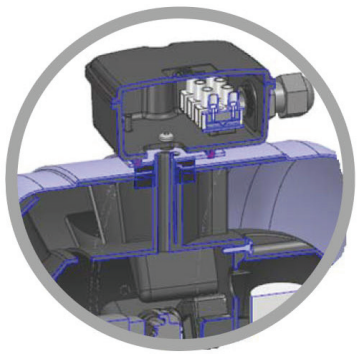
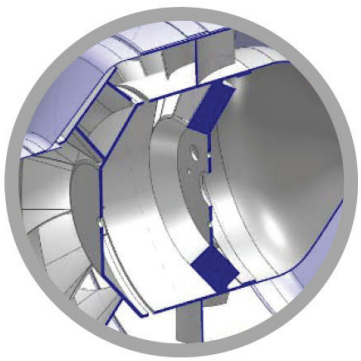
INTERNAL AIRTIGHTNESS

Specific design to get a tight fit between the metallic housing and the internal plastic guide-vanes to avoid air leakage.



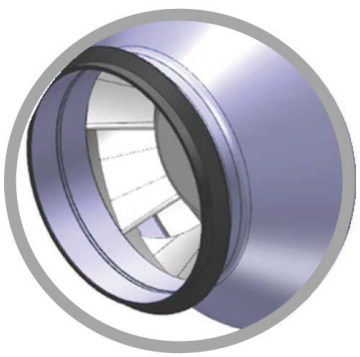


GUIDE-VANES

Extended guide-vanes placed further away from the wheel to improve efficiency and reduce the noise level.

EXTERNAL AIRTIGHTNESS

Circular duct connection with integrated rubber seals to allow airtight installation with duct system.

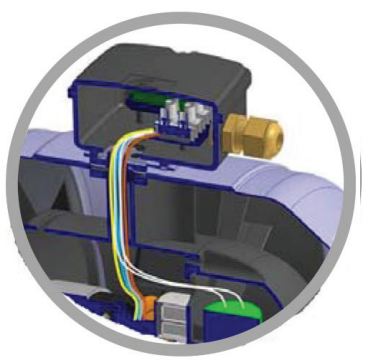


SILENT-BLOCK

Motor fitted on the guide-vane support with a silent-block to avoid transmission of vibrations and reduce the noise level, mainly when using with speed controller.

SEALED TERMINAL BOX

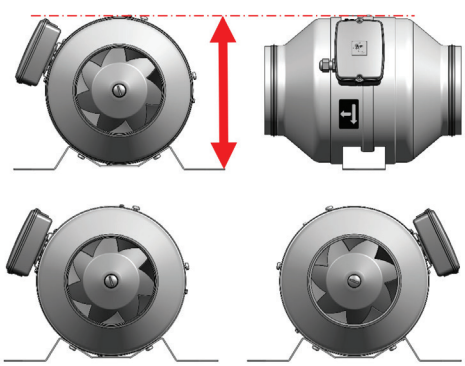
Large bi-material injected plastic terminal box sealed with the fan housing.



IMPELLER

Optimisation of the impeller geometry to obtain a low-profile product, increase efficiency and reduce noise level.

The terminal box and the support bracket add nothing to the total height of the products while the mounting bracket allows the fan to be mounted in two positions.



Tel: 01 412 4020 sales.ie@solerpalau.com

Digitilisation changing the entire value chain

Digitalisation is now a key factor across all market segments of the building services sector but it is in pumps, where Wilo has been very much to the fore, that it is most evident. Increasingly, Wilo is moving away from being just a product supplier to becoming a system partner, and digitalisation is critical in this respect.

Through continuous development and innovation, Wilo has achieved many milestones since the company was first established in 1872. It has always invested heavily in R&D and the ongoing €200 million plus investment programme in the new development facility in Dortmund has digital technology at its core.

Digitalisation is changing the entire value chain and is reflected not just in product and system solutions but also in pump production processes and working procedures.

Stratos Maxo

The fruits of that commitment are epitomised by the Stratos Maxo range which has confirmed Wilo's position as the digital pioneer in the pump industry. The successor to the Wilo-Stratos, it sets new standards in system efficiency and user-friendliness, and was awarded the prestigious "Design Plus Award" at ISH.

"The Stratos Maxo is the world's first true smart-pump," says Derek Elton, Managing Director, Wilo Ireland. "The new Green-Button-Technology combines proven handling with new and optimised functions, creating a completely new level of user-friendliness. Its high degree of connectivity makes it an extremely flexible solution."

An integrated heat energry meter and the latest communication interfaces enable Stratos Maxo to be directly connected to mobile devices without accessories. Meanwhile, "Wilo Net" offers a new standard interface for connectivity among Wilo products, for example, to control multiple pumps.

WIlo Stratos Maxo

Wilo-Yonos PICO

Yonos Pico

On the domestic front the Wilo Yonos PICO range is a visible symbol of WIlo's new generation of high-efficiency pumps for heating and air-conditioning systems in residential dwellings. The green operating button stands together with new functions for maximum convenience for commissioning and maintenance. Features and benefits include:

- Three-speed manual function option;
- Maximum operating convenience;
- Intelligent settings and new functions;
- Intuitive user interfaces;
- Quick, easy installation;
- Seamless replacement;
- Optimised energy efficiency;
- Easy maintenance;
- Maximum operating safety.

Contact: Wilo Ireland.
Tel: 01 – 426 0000;
email: sales@wilo.ie;
www.wilo.ie

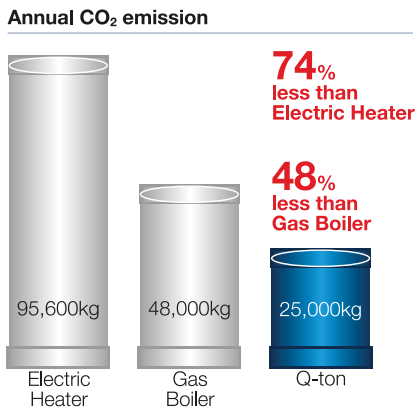
Q-ton Air to Water

Hot water solutions for commercial applications

Why Q-ton?

The high efficiency Q-ton is an air-to-water heat pump that uses CO2 gas as a refrigerant and can be used in a variety of applications for the supply of sanitary hot water. It maintains high efficiency and significantly improves performance at cold outside air temperatures.

Diamond Air Conditioning and Mitsubishi Heavy Industries (MHI) are synonymous in Ireland, Diamond principals Michael Clancy and Graham McCann both having a long association with the brand. MHI has captured a significant market share in recent years, thanks largely to the combination of its pioneering products incorporating innovative technologies, and the strong technical, design, commissioning and after-sales support provided by Diamond Air Conditioning. The range is extensive and extends from small cooling/heating systems to large modular systems for commercial buildings. Two of the latest introductions are the highly-acclaimed Q-ton air to water heat pump and the KXZ VRF Series featured here.



Features and benefits

- Outstanding performance;
- Exceptional energy efficiency;
- Reduced running costs;
- Reduced carbon emissions;
- Uses safe and highly-efficient CO2 refrigerant;
- Delivers constant hot water supply from 60°C to 90°C;
- Maintains full capacity, even at a low ambient temperatures.

Using CO2 gas as a natural refrigerant

KXZ VRF Series for High Performing Cooling and Heating

The new Mitsubishi Heavy Industries KXZ VRF series delivers high performance in cooling and heating for all commercial applications. It offers the highest level of design flexibility, improved efficiency and enhanced operational functions.

We've Always been Solutions Focused

VTCC

The Variable temperature and capacity control (VTCC) is a newly-developed energy saving function specifically designed to maximise energy savings in partial load conditions throughout all seasons.

Flexible pipe length

One of the key features sees maximum piping length between indoor unit and outdoor unit now at 160m, while the maximum height difference has been increased to 70m. This gives greater flexibility of installation.

Peak cut control

The peak cut function can easily be set to control the capacity and provide improved energy savings in the long run. Five steps of capacity control are available with 100%, 80%, 60%, 40% and 0% settings.

Tool E-solution

Using MHI's E-Solution software tool, which includes specification details of the latest KXZ VRF systems, engineers can select the most cost-effective and energy efficient mix of indoor units, outdoor units, pipework and controls.

Improved scroll compressor

The enhanced KXZ multi-port compressor includes two additional discharge ports which optimise the pressure control within the compressor.

Priority Operation

The KXZ has four operation modes – First Unit Operation, Last Unit Operation, Majority Operation and Master Operation.

Emergency stop function

The new KXZ has control for emergency stop by external input, i.e. an alarm unit can be connected to the PCB.

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100% IRISH DIAMOND AIR CONDITIONING, LTD.

dwg MITSUBISHI HEAVY INDUSTRIES Air Conditioning a BEIJER REF company

MITSUBISHI HEAVY INDUSTRIES AIR CONDITIONING EUROPE
MOVE THE WORLD FORWARD

www.mhiae.com

The task of replacing the heating system in an older building is always challenging but, when that building was originally built circa1865, it can be daunting. So it was with the Chancery St Courthouse project in Dublin where Davies Industrial, part of the Davies Group, sized and supplied all the mechanical equipment for the plantroom upgrade. Mechanical contractor on the project was Haughton & Young.

'IDEAL' solution for OPW at Chancery Street Courthouse

A big factor in sizing the plant was the old design of the heating system. Peter O'Brien (B.Eng), Commercial Manager with Davies, put together the solution to meet all of the OPW requirements with the plantroom equipment consisting of the following:

- Three IDEAL EVO-S 135kW stainless steel condensing boilers as part of a cascade kit;
- 400kW stainless steel gasket-type plate heat exchanger;
- Grundfos pumps and booster set;
- Gas detection.

This new equipment will deliver high-efficiency, low-cost heating to the building. Prior to the installation of the new IDEAL boilers, the courthouse was heated by two standard-efficiency boilers that were over 35 years old. They had to constantly run at full capacity to try and meet the heat demand of the building. This led to high energy use and therefore increasing running costs.

The units also began to require continuous maintenance. Due to this the decision was made to upgrade the boilers to newer, more reliable, condensing boilers with the solution being devised by Davies Industrial.

"We had to ensure there was a minimal drop in flow temperature from the primary side of the heat exchanger to the secondary side into the building," said Peter O'Brien, "and in the end we were able to achieve only a two degree drop between primary and secondary side."

Before – Plantroom prior to work commencement.

After – The newly-refurbished plantroom showing the three IDEAL boilers and all the other key elements of the system.

The IDEAL EVO-S stainless steel heat exchanger boilers come in five different outputs – 50kW, 70kW, 95,kW 115kW and 135kW. Units are available in LPG up to 95kW and it is possible to cascade up to 540kW. The boilers come complete with a 5-year warranty as standard and offer high efficiencies of up to 108.9% (fully condensing) and a 5:1 turndown ratio. All are available from Davies Group Ltd.

Contact: Davies at 01 – 851 1700 or Peter O'Brien at 086- 021 6992. ■

Healthy approach to hospital pump solutions

With so much written recently about hospital waiting times and the many pressures that the health services are under, it is very easy to overlook the fact that there are also many positive activities taking place up and down the country. The fact that some of these improvements are taking place, literally behind closed doors, makes it even more important to place a spotlight on them.

Some of these advances have come about as a direct result of key energy targets that have been set out by the HSE. These include:

- Reduce emissions from the public sector by 30% by 2030;
- Ensure every public body will adopt a mandate for climate action by 2019;
- Improve the energy efficiency of public sector buildings by 50% by 2030.

Despite the pressures, many organisations within the HSE have stepped up to the plate and gone beyond the brief. This is certainly true in the case of Sligo University Hospital, a busy 359-bed, acute general hospital, that recently had its efforts to reduce energy use recognised by the SEAI when it was announced as the winner of the Sustainable Energy Public Sector Award.

This accolade was well deserved as the hospital adopted an "Energy Map Programme" that combined a range of activities from quizzes and competitions to raise awareness, to upgrading the M&E equipment, which has delivered a significant 20% overall saving.

The system upgrade focussed on changing the boilers and the pumps. Here Grundfos came to the fore to provide HSE Sligo with a detailed "Energy Check" report that outlined the energy savings that could be achieved by exchanging the existing pumps with intelligent MAGNA3 and TPE3 pumps.

The flexibility of MAGNA3 means it can support light, medium and large commercial heating, air conditioning and cooling systems. With its simple installation wizard, the MAGNA3 has been designed for easy and intuitive installation. It comes with a high-resolution colour display and, once the pump is turned on, the Assist™ software immediately guides the installer through set-up. It also has many other advanced features including AUTO*ADAPT*, FLOW*ADAPT* and FLOW*LIMIT* that help to optimise energy usage and ensure stable performance.

The extremely efficient range of Grundfos TPE3 in-line pumps was also an obvious choice for the hospital. These pumps easily meet the IE5 ultra-premium motor efficiency standard and are suitable for use in a wide range of commercial and industrial applications.


The 359-bed Sligo University Hospital.

Grundfos MAGNA3 supports heating, refrigeration and cooling systems.

The pumps are all remotely monitored via Grundfos CIM300 BACnet cards which allow the operators to monitor and trend individual pump performance. The hospital has also taken advantage of the integrated heat energy monitors available on all Grundfos MAGNA3 and TPE3 model pumps. This enables it to map and build up an understanding of the main heat users throughout the hospital.

The Irish healthcare system is still considered to be one of the best in the world and was ranked 13th out of the 195 countries in 2019. With help from Grundfos, Sligo University Hospital is now at the forefront of modern healthcare while, at the same time, delivering significant energy savings.

Contact: Grundfos Ireland.
Tel: 01 – 408 9800;
email: info-ie@grundfos.com;
www.grundfos.ie ■

Above: Grundfos TPE3 in-line pumps are an obvious choice for hospital environments.

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- elimination of water hammer
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CIBSE annual golf outing at Luttrelstown

The early morning drizzle and heavy cloud cover hovering over Luttrelstown Golf Club did not augur well for the CIBSE Ireland annual golf outing but, as it happened, the weather cleared and the capacity turnout enjoyed a great day's golf.

Luttrelstown is a long course and the warm, sometimes clammy conditions meant that those who did not have a powered golf bag found it heavy going. Scoring was still impressive with the participating teams seriously intent on taking the overall trophy.

The shotgun start also meant that approximately 120 sat down to dinner and the presentation of prizes. All credit to the organising committee for the efficiency with which the event was managed. Thanks also to overall sponsor Euro Gas.

Results

Winning Team: McKeon Group

Second: Winthrop Engineering

Third: Euro Gas 1

Long Drive: Declan Donnelly (sponsored by Pegler)

Nearest the Pin: Liam Elmore (sponsored by Wilo)

Holiday voucher: John Delaney (sponsored by Euro Gas)

Overall winners – Team McKeon Group: Bernard Byrne, Stephen Weir, John Garry and Chris Dore with Mona Holtkötter, CIBSE Ireland Chair.

Third – Team 1 Euro Gas: Jimmy Sadlier, Liam Elmore, David Pepper and Des Haughton with Mona Holtkötter, CIBSE Ireland Chair

Second right: Nearest the Pin – Liam Elmore, winner with Derek Elton, sponsor, Wilo Ireland.

Holiday voucher – John Delaney, winner with James Porter, sponsor, Euro Gas.

Second – Team Winthrop: Stephen Conneely, Bobby Vance and Darren Kavanagh with Mona Holtkötter, CIBSE Ireland Chair.

Outing sponsors: Michael Curren, CIBSE Ireland Vice-Chair with James Porter, Euro Gas, Mona Holtkötter, CIBSE Ireland Chair and Martin Garvey, Euro Gas.

Longest Drive – Declan Donnelly, winner with Sean Byrne, sponsor, Pegler.

MAXXflo EVO

– water heating technology at its max

Following customer feedback on the award-winning MAXXflo, Andrews Water Heaters has now introduced the enhanced MAXXflo EVO. According to Damian Delaney, Operations Manager, Baxi Potterton, this new unit takes water heater performance, efficiency and reliability to the next level and is the future of water heating technology.

Built-in BMS connectivity as standard, an attractive new look and increased functionality means that the MAXXflo EVO provides specifiers with a cost-effective means of meeting their customer's individual hot water needs.

Available in 30kW - 60kW models with a 200lt capacity, and 30kW - 120kW models with a 300lt capacity, the future-proofed new design has been specified to meet the needs of many commercial buildings. For instance, the MAXXflo EVO is suitable for use in premises such as large hotels, government buildings and office blocks.

With customers calling for boosted efficiency levels, the new MAXXflo EVO is designed to be low NOx with emissions of 39mg/kWh and below, meaning it is suitable for specification and integration into larger commercial premises in areas with even the most stringent air quality policies. This means that everyone can benefit from increased efficiency and maximum performance.

Interior view of the MAXXflo EVO.

Hosting in-built BMS control as standard and optional web server availability, the MAXXflo EVO has enhanced control and functionality at its core. Interfacing with BMS enables remote monitoring for reduced downtime and improved site operability.

Along with diagnostic emails and alerts, it provides site managers with real-time information that can be conveniently reviewed off-site. Enhanced BMS connectivity can also help management teams identify site-specific problems and maximise maintenance efficiency.

Contact: Baxi Potterton Myson.
Tel: 01 – 459 0870;
email: sales@potterton-myson.ie;
www.andrewswaterheaters.co.uk/ ■

"I was able to see the work involved in the procurement of plant and systems, and how difficult it is to ensure like-for-like quotations are being put forward …

"I saw first hand the challenges faced when it comes to commissioning a system when the sub-contractors haven't met their deadlines, and the knock-on effect on the whole project as a result of this …

"I found the exchange to be very beneficial to my professional development, a knowledge enhancer and confidence builder …

"An option for a more intense, shorter exchange may prove useful for parties going forward. However, it would require much more input from the supervisor/mentor involved to provide the work and support needed …

"I hadn't fully appreciated that the contracting team must line up sub-contractors to be available for start dates, and the implications this can have when the date isn't finalised, or is changed.

Kerry Taylor

workshare exchange programme

CIBSE IRELAND

CIBSE Ireland Workshare Exchange Programme proves a major success

The inaugural CIBSE Ireland Workshare Exchange Programme has proved a major success with the first participants – Kerry Taylor, Axiseng and Tom Egan, Winthrop Engineering & Contracting (pictured below) – reporting excellent outcomes. Devised to build and strengthen relationships between engineering and contracting companies in the building services sector, the core objective was for the participants to gain insights into the working practices of each other's disciplines.

Back row: Richard Vaughan, Principal Mechanical Engineer and Cian Dowling, Director, both of Axiseng; Ciaran Morgan, HR Director, Harry Irvin, Contracts Manager and Thomas Sheridan, Project Manager, all of Winthrop Engineering & Contracting; and Pat Lehane, CIBSE Ireland Workshare Programme Coordinator. Front row: Mona Holtkoetter, Chair, CIBSE Ireland with Kerry Taylor, Mechanical Design Engineer, Axiseng and Tom Egan, Project Engineer, Winthrop Engineering & Contracting.

The programme commenced in May of this year and ran until the end of July. During this period Kerry and Tom carried out their normal duties on the project, but also spent a full day every week in each other's office, effectively doing one another's work.

For the most part they both worked on the shared Spencer Dock project in the north Dublin docklands but, as the programme evolved over the scheduled 12-week cycle, they became involved in other projects also.

While the main focus was initially on the engagement of both Kerry and Tom, it soon became apparent that the role of their respective mentors – Richard Vaughan from Axiseng and Thomas Sheridan from Winthrop – was equally important. Their active involvement ensured that, in addition to being integrated into the core team working on the Spencer Dock project, both Kerry and Tom were treated almost as direct employees by their host companies on the days in question.

On conclusion of the formal part of the programme at the end of July, Kerry and Tom reviewed their experiences over the course of August and then presented a comprehensive report to all involved during the wrap-up session in August.

Their respective views, opinions and suggestions were multi-faceted, and dealt with many of the anticipated challenges envisaged from the outset of the programme. However, more telling and informative were the learning outcomes from issues and situations that had not been foreseen. These have all been taken on board and will undoubtedly help shape the structure and roll-out of the programme going forward.

"I gained a valuable insight into how information or intent may get lost in contract documents as they are drafted and issued from designer to contractor …

"The most important outcome is that I gained an understanding of how designs are produced, and the various design tools used such as IES models, design guides, calculation spreadsheets, etc …

"The idea of a basis of design document, and then preliminary design stage (all before tender stage), were processes I got to see first-hand. I would not have seen that before …

"From my point of view designs sometimes vary widely in their completeness. It was beneficial to gain an understanding of how the designs are typically completed for issue, and indeed how complete they need to be before tender …

"The practical design work I did while at Axis will certainly stand to me in the future.

Tom Egan

HEVAC GOLF DAY

Sun shines on annual Hevac golf day

Beech Park Golf Club in South County Dublin was the venue for this year's Hevac annual golf outing. While not the longest, the course is still difficult to score on so overall individual category winner Alan Carton did exceptionally well with 41pts. He also won the longest drive, and was a member of Team Compression who won the team category with a score of 84pts.

Participants included a very broad cross-section of the industry with Hevac customers and guests coming from all corners of the country to enjoy the day. Given the fantastic weather it was hard not to, with shorts and short-sleeved tops being the dress code on the course.

Hevac are very generous hosts and apart from the hot food and refreshments on the 10th, there was dinner in the evening and the presentation of prizes. While competition, especially in the team category, was quite serious on the day, the ribbing was good-natured with the emphasis on enjoyment and social networking. This is what makes it one of the most popular events in the building services industry calendar. ■

Second place – Team Delbraze: Reuben Keogh with Martin Finnegan and Shane McConn.

Third place – Team K65: Jason O'Flynn with Brian Murphy and Gary Keeling.

The winners – Team Compression: Darren Yourell with Alan Carton and Martin Breen. Alan also won the overall winner and the longest drive!

New A+++ Aerona³ R32 heat pump range from Grant

Operating at the forefront of Ireland's plumbing and heating industry, leading manufacturer of heating technologies Grant has introduced its new A+++ Aerona³ R32 inverter-driven air source heat pump range. The new range represents Grant's committment to providing the industry with both innovative and efficient high-quality heating solutions that provide end-users with unrivalled benefits.

Available in outputs of 6kW, 10kW, 13kW and 17kW, the range meets upcoming legislative targets outlined in the 2014 EU Fluorinated Greenhouse Gas (F-Gas) Regulations by featuring R32 refrigerant which holds a lower global warming potential than traditional heat pump refrigerants. It therefore provides a cleaner and more environmentally friendly operation.

Providing both heating and hot water to a property, the heat pumps build on the popularity of Grant's previous air source heat pump offering. They are highly-favoured by those within the trade completing new-build projects and help meet Part L compliance as required under the Building Regulations. In addition to the environmental benefits associated with the air source heat pumps, the Grant Aerona³ range is exceptionally efficient, achieving an impressive A+++ energy rating at low temperatures.

Barry Gorman, Grant Technical Team, said: "When designing and manufacturing our heating products, priority is given to providing end-users with the highest quality and best performance. We also take industry requirements into consideration as there has been a real shift in recent years, with a stronger focus now on integrating products with a lower environmental impact into all aspects of our lives, including home heating."

The R32 air source heat pumps incorporate several clever features including weather compensation controls and a base tray heating element to stop ice formation in cold weather conditions. With a sleek and compact design, models within the Aerona³ range are also designed to have minimal impact on their surroundings.

The 13kW and 17kW models in the range recently received recognition from Quiet Mark, an international award programme which validates and awards low-noise, high-performance technologies which help deliver solutions to overcome noise pollution. This accolade is only awarded to products which meet the programme's criteria, and which are identified as being among the quietest models within their given category.

The models within the Aerona³ R32 range champion a superior seasonal coefficient of performance (SCOP), delivering more than four times the amount of heat energy for every 1kW of electricity used. Integrating clever technology, the heat pumps modulate up or down depending on prevailing climate conditions and demand, giving the end-user total peace of mind that the heating system is being as efficient as possible all year round.

"The R32 air source heat pumps are a great renewable energy alternative as they can reduce a property's overall carbon emissions and achieve Part L compliance without having to sacrifice on performance and efficiency outputs. The launch of this range is just one way in which we continue to drive innovation in the industry, and we look forward to expanding our product portfolio in the near future," added Barry.

For more information on Grant's range of innovative heating solutions see www.grant.eu. You can also follow Grant on Facebook and Twitter @ GrantIRL or Instagram @Grant_IRL.

Think Heating. Think Grant. ■

Grant's new A+++ Aerona³ R32 inverter-driven air source heat pump range.

Humidification advice for installers

Most HVAC contractors don't regularly undertake humidification projects so building up enough experience to avoid the possible pitfalls can be difficult. Here *Damien Power, Sales Manager for Ireland at Condair plc*, gives advice on what contractors taking on a humidifier project ought to consider.

Damien Power, Condair Area Sales Manager for Ireland.

Beware value engineering

One size does not fit all when it comes to humidifiers. Typically, humidity control of ±2 to 5%RH needs resistive steam humidifiers. Installing an electrode boiler humidifier is less expensive but this technology can usually only deliver around ±10%RH. It is ideal for many applications but not sticking to a higher-specked unit can cause headaches for both client and contractor.

How to save costs

Traditionally, humidifiers were seen as expensive to run but there are now several alternatives to reduce the costs of humidification. Gas-fired steam humidifiers present at least a 60% saving on energy costs when compared to electric steam. In-duct adiabatic humidifiers, which either spray or evaporate moisture, present a similar saving when combined with gas-fired pre-heating. For further savings, combining adiabatic humidifiers with heat recovery can reduce the ongoing cost of humidity control to less than 10% of electric steam systems. Adiabatic humidification also offers the benefit of evaporative cooling.

Plan early

The earlier in the project the humidification is thought about, the more options are available. For instance, what is the available section length in the duct? Steam introduced to a duct will need space to fully absorb in order to prevent condensation. Considering the available energy sources can also lead to a dramatic reduction in overall operating costs, while capacity in a building's AHU gas-fired heating system makes fitting an adiabatic humidifier much more practical than also needing to install pre-heating.

Water quality

The quality of the mains water in a building must be reviewed prior to humidifier selection. An average water quality of between 125-500µS is fine for an electrode boiler steam humidifier. Below or above this level and an electrode may experience issues, either boiling the water or producing too much scale. Gas-fired or resistive humidifiers can cope with a wider range of water qualities. RO water treatment is also a good solution for humidification in hardwater areas.

The Condair DL combines spray and evaporative technology, and can deliver 2%RH control.

Control level

The level of humidity control needed is a major determining factor in humidifier selection. Although resistive steam humidifiers are a popular choice for close control, recently-developed cold water systems can provide a similar level. Hybrid humidifiers, such as the Condair DL, combine spray and evaporative technology, and can deliver ±2%RH control. Gas-fired, electrode boiler or evaporative humidifiers are all capable of delivering around ±10%RH, which is fine for most applications related to human health.

Expert advice

One of the most important things to consider when setting out on a humidifier project is to get good advice from a competent supplier. Additionally, all humidifiers need to be maintained, so check whether the supplier can undertake this directly or provide assistance should you wish to continue to support the client in the long-term.

Contact: Damien Power, Condair Area Sales Manager for Ireland.
Tel: 091 – 507 120;
email: ie.sales@condair.com
www.condair.ie ■

360 CASSETTE

Comfortably cool … never too cold

With a unique circular design, bladeless technology and three booster fans, the Samsung 360 from GT Phelan softly disperses cool air via a horizontal airflow that eliminates "hot" spots. There is also the option to direct the air at various angles as the innovative booster fan expels cool air at much lower angles. It creates a low pressure zone around the outlet and directs the cool air parallel to the ceiling, dispersing it across a wider area.

Occupier comfort and wellbeing is assured with the indoor air being kept comfortably cool without the feeling of draughts. Thanks to an absence of blades to block the airflow, it also circulates 25% more air resulting in increased coverage.

The 360 cassette fits perfectly in any location, with a sleek and sophisticated circular design that complements a multitude of interior design styles. Never before has the system designer and interior architect had such a technically-advanced, high-performing air conditioning unit that is also a design feature it itself. It dramatically enhances the interior aesthetics of all projects, no matter what the setting or application.

Available in black and white, designers can choose from a circle or square fascia panel, with models available as split systems (which can be twinned), or as part of the VRF (DVM) range. User comfort is further enhanced by the very low sound levels on low fan speed (29dB(A)) on the 5kW VRF and 7kW split models.

Samsung's WiFi adaptor allows for remote control of all VRF and split systems from a mobile device when using Samsung's Smart Home App. One WiFi adaptor can control up to 16 indoor units on a single DVM S system, or connect a maximum of four adapters for control of up to 64 indoor units on the same system. Group configuration allows for simple control of multiple units connected to the same WiFi adapter.

For applications where a wireless controller is not acceptable (i.e. public facilities), three wired controllers – Simple, Touchscreen and Premium – are available to purchase as an option. Samsung also offers a variety of wired controllers suitable for any application.

In addition, Samsung's Data Management Server (DMS) lets users monitor and control on-site air conditioning needs remotely, making it the easiest and most convenient way to manage a large number of air conditioning units at once.

Contact: GT Phelan.
Tel: 01 – 288 4377;
email: info@gtphelan.ie;
www.gtphelan.ie ■

Unitherm Galway race day

Rebecca Raftery with Keith Flood, Emma Duffy and Ciaran Duffy, In2 Engineering.

Patrick and Emma Field, O'Connor Sutton and Cronin.

Paula and Anthony Lydon with Lorraine and Shane Nevin, Granbrind.

Unitherm Heating Systems put its own unique spin on the Galway Races by hosting a customer race day in a specially-erected marquee at its Galway premises. Merchants, developers, installers and specifiers from all over the country mingled with one another for a day of fun and networking.

Galway Bay FM DJs provided the entertainment. There was an abundant and constant flow of barbeque food and refreshments, in addition to entry tickets for the actual race meeting. Experienced tipsters were on hand to advise on horse selection, and there was a draw for two large flat-screen TVs.

The wonderful weather was a welcome additional bonus and this, in turn, prompted the guests to dress in their finest outfits. The occasion proved to be extremely successful with everyone having a wonderful day. ■

Martina and Declan Kissane, Unitherm.

Digital tools for installers from Paroc

PAROC stands for energy-efficient and fire-safe insulation solutions for new-build and renovated buildings, acoustics and other industrial applications. Thermal Insulation Distributors (TIDL) supplies its entire portfolio in Ireland, and also supports installers with Paroc's extensive digital-format installation guides.

Paroc has a wide range of advanced products and tested solutions that are specifically designed to answer the insulation requirements of ventilation systems.

New installation animations are now available, along with the updated calculation program "Calculus". These are found together with the respective product or solution at https://www.paroc.co.uk/

The latest Paroc Calculus Login online version has just been published and creating an account allows the online storage of projects, calculations and customisations. It is a free, simple-to-use, technical insulation calculation program for different HVAC and process industry applications, e.g., pipes, ventilation ducts and tanks with a series of benefits for the user. These include:

- Easy to use interface;
- Works on PC, tablet and mobile phone;
- Calculations for heat loss, surface temperature and temperature drop in pipes, ventilation ducts, process industry tanks, valves and flanges;
- Easy input of pipe and duct diameters (predefined);
- Thermal bridges of pipe and duct suspensions;
- Energy savings, freezing times and other advanced features to help properly specify products;
- Insulation weight calculated;
- Print out calculations to PDF;
- All calculations are based on equations described in the EN ISO 12241 standard;
- Custom products, media and cladding can be added.

Contact: Thermal Insulation Distributors Ltd. Tel: 01 – 882 9990; email: sales@tidl.ie; www.tidl.ie ■

BDR installs world's first hydrogen-powered domestic boiler

BDR Thermea Group has installed the world's first hydrogen-powered domestic boiler in a real-life situation in Rozenburg, the Netherlands. This ground-breaking boiler burns pure hydrogen that has been produced by wind or solar energy without releasing any CO2.

The project is a joint initiative with network operator Stedin, the municipality of Rotterdam and housing cooperative Ressort Wonen. The hydrogen boiler is installed in a boiler room alongside an existing conventional natural gas boiler which will ensure that the residents have sufficient heat and hot water at all times.

Stedin is using an existing regular pipeline to supply the hydrogen, demonstrating that the existing gas network is suitable for carrying hydrogen. Together Stedin and its partners are considering the entire chain of the future – the production, distribution and conversion of hydrogen, with the ultimate aim of providing zero-carbon comfort.

This is the first real-life situation in which pure hydrogen is being used to fuel a high-efficiency condensing boiler to heat the central heating system of a residential building. After the first pilot in the Netherlands, which is being carried out by the Group's Dutch subsidiary Remeha, there will be a larger-scale field trial in the UK involving 400 hydrogen boiler installations. New opportunities for projects in other European countries are also being explored as part of the broader, pan-European development of this technology.

Bertrand Schmitt, CEO of BDR Thermea Group told *Building Services News*: "The development of a hydrogen boiler is part of BDR Thermea Group's solution for decarbonising heating. We currently offer a range of technologies, such as high-efficiency gas boilers, heat pumps and heat networks, and now also hydrogen boilers and fuel cells. Sustainably-produced hydrogen is an important, potentially very interesting energy carrier for the future."

The operating principle of the hydrogen boiler is the same as that of a boiler running on natural gas," says Peter Snel, CTO of BDR Thermea Group. "In the future, we will be able to exchange conventional gas boilers for hydrogen boilers on a like-for-like basis, provided the supply of hydrogen is available through natural gas pipelines. That is why co-operation with network operators is of crucial importance.

"We would like to invite other network operators and building owners in Europe to collaborate in field tests as well. In this way, the development of a CO2-free heat supply will be accelerated. This will also boost the production of sustainable, green hydrogen using wind and solar energy." ■

Image of the plant room with the hydrogen boiler in position next to the conventional natural gas boilers at the housing cooperative project in Rozenburg, the Netherlands.

■ BTU GOLF NEWS

Ladies and gents day at Woodbrook

After a long absence the BTU returned to Woodbrook Golf Club for the Summer outing. The day featured a regular members competition, along with a ladies singles competition on the same timesheet.

Apart from the intermittent showers the sun made the odd appearance and the scenery of North Wicklow was magnificent. Sponsor was BSS Ireland. Results were as follows:

Overall Winner: Gerry Hutchinson, 34 pts.

Class 1: First: Maurice Kelly, 33pts; Second: Joe Warren, 31pts; Third: Michael Kearney, 30pts.

Class 2: First: Vincent Broderick, 33 pts; Second: Gerry Tobin, 32pts; Third: Michael Bready, 29pts.

Class 3: First: David Daly, 30pts; Second: Tom Fitzpatrick, 25pts; Third: Padraig Gillen, 24pts.

Ladies prize: First: Geraldine Coghlan, 29pts; Second: Lilian Gillen, 28pts.

Front 9: Michael Mathews, 15pts; **Back 9:** Jim Bollard, 17pts.

Visitor: Sean Byrne, 33 pts.

Woodbrook: Geraldine Coghlan, Ladies winner with Jason Warnock, BSS Ireland

Woodbrook: Jason Warnock, BSS Ireland, sponsor with Sean Byrne, Visitors Prize winner.

Newlands: Brian Keavney, Lynch Interact, sponsor with overall winner Sean Smith and John White, BTU President.

President's Day at Newlands

Twenty eight golfers played in President John White's outing at Newlands where the sun shone and the beautiful autumnal colours added to the occasion. Sponsor was Lynch Interact. Results were as follows:

Overall Winner: Sean Smith, 34pts (Back 9).

Class 1: First: Seamus Kiernan, 34pts; Second: Martin Keogh, 33pts.

Class 2: First: David Rossiter, 29pts; Second: Michael Bready, 28pts.

Class 3: First: David Daly, 30pts; Second: Tom Fitzpatrick, 25pts.

Front 9: John White, 18 pts; **Back 9:** Maurice Kelly, 18pts.

Visitor: Alan Coghlan, 32pts.

Newlands: David Rossiter, winner Class 2 having received his prize from John White, BTU President.

Hitherto unimaginable LIGHTING SOLUTIONS NOW A REALITY

Task LED is the brainchild of Gearóid McKenna (below) who has spent 40 years in the lighting industry and has experience across all industry segments, from product development and manufacture through to specification and the minutiae of functionality and design.

"The future of lighting is exciting," says Gearóid, "with advancements in technology and genuine product innovations coming to market at an incredible pace. Features and capabilities that were unimaginable just a short time ago are now commonplace, the greatest challenge for specifiers, system designers and installers being to keep abreast of what is possible.

"It is against this background that I have established Task LED. By partnering with world-renowned lighting specialists Selux and Cree, we offer the amazing functionality and exquisite designs their ranges represent. In doing so we apply the experience, technical know-how, design strengths and back-up resources of Task LED to complement those products and systems. The result is project-specific solutions that are cost-effective, energy efficient, regulation compliant, sustainable and future-proofed.

"This latter point is especially important. Let's face it, the world is rapidly changing and nowhere more so than in lighting. For specifiers and installers to just keep abreast of these changes, let alone the changes fast coming down the development track, is extremely difficult. We're currently witnessing the evolvement of this industry to a new paradigm, one that is no longer fulfilling a need but intelligently paving the way to a new world. At Task LED we aim to guide and support architects, consulting engineers, designers and planners to assist with this process so they can maximise the potential that it represents."

Task LED works with its principals who have prepared for the future with the most innovative and progressive ideas in modern, task-focused lighting. Light has never had more significance, socially and culturally, and suppliers must deliver ambitious lighting solutions that stretch beyond traditional boundaries to meet, and exceed, exacting specifications in modern connectivity and efficiency.

Functionality, efficiency, compliance and aesthetics have always been drivers in lighting. However, given the phenomenal pace of change, it is difficult for lighting professionals to keep pace with the vast and futuristic potential that cutting-edge developments in modern lighting entail. Task LED has a thorough understanding of these developments, and of the regulations, nuances and expectations of today's marketplace.

Task LED delivers ambitious lighting solutions that stretch beyond traditional boundaries to meet and exceed exacting specifications in modern connectivity and efficiency. These extraordinary products and systems bring the future pulse to today's projects, offering longer service life, minimal energy consumption and ground-breaking levels of social responsibility through modular systems that enhance public safety, increase connectivity and extend services.

Lighting is an integral part of the drive for sustainable, responsible practices. It has a huge role to play in energy saving, carbon footprint reduction and the wellbing of building occupants. Be it new-build or retrofit, Task LED intends to play a critical role in the drive for, and realisation of, those objectives.

Contact: Gearóid McKenna, Task LED. Tel: 01 – 287 0528; Mobile: 086 – 851 6989; email: gearoid@taskled.ie; www.taskled.ie ■

World renowned partners

Task LED has partnered with two world-renowned lighting companies and applies its experience, design and support capabilities to the strengths of these industry-leaders to deliver project-specific solutions. Brief details of each are as follows.

The ethos at **Selux** is to improve lives and respect the environment. This keeps the company on the leading edge of lighting concepts – digitally-advanced products for smart cities, dark-sky-conforming luminaries, and ergonomic superiority in its families of products.

Cree is a market leader in innovative, highly-efficient, task-focused lighting. Its NanoOptic technology, shortlisted for best technology 2018, is a reflection of its dedication to forging new standards in advanced, contemporary lighting to provide optimum optical control and light quality.

LIGHTING

Dr Alan J Meaney

Several 'lifetimes' to consider when making LED lighting projections

We spend €500 million keeping the lights on each year while lighting accounts for 12% of all electricity use within the EU 28[1]. Scaling that to Ireland, our demands come in at 3.1 billion kWh[2], but there is growing acceptance that much of this energy use is unnecessary. Employing smart or more efficient lighting than traditional sources such as filament, HPS, fluorescent tube or halogen can significantly contribute to our growing appetite for positive climate action. LEDs installed in new or retro-fit fixtures produce immediate savings over traditional light sources, and not exclusively financial ones.

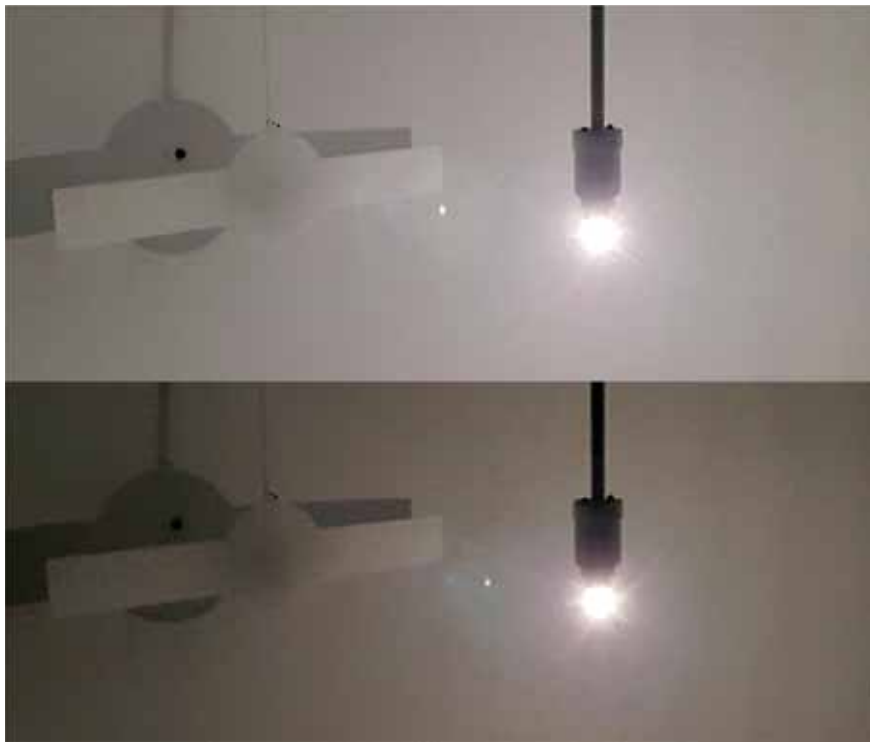
Ireland's Climate Action Plan 2019 gives annual targets for non-ETS (emission trading systems) carbon reduction. Even a very conservative estimate of a 50% saving from LEDs offers a reduction of €250 million per year and would contribute to 10% of Ireland's target non-ETS carbon target for 2021. The numbers can be even bigger … energy savings of 90% when compared to traditional lighting are not uncommon. The technology becomes even more attractive when you consider that the cumulative savings over the exceptional lifetimes of LEDs are many tens of thousands of hours. To put this in context, the expected life of some LED street lamps is 100,000 hours, or about 22 years of normal use.

Buyers, manufacturers, local authorities, regulators and end-users all have a vested interest in high-quality, long-lasting, energy-efficient LED products. The qualifications here are very important. It is the performance of the LED that determines the financial, energy and carbon savings. However, we need to understand what LED failure means before we discuss performance.

It is apparent when traditional lighting reaches the end of life … it no longer outputs any light. The end of an LED luminaire is not always clearly evident, nor is it well defined. Phrases such as "lumen maintenance", "rated lifetime", "survival factor" or "useful life" can lead to a lot of confusion. The lumen maintenance or LM value is the time taken to reach some percentage of initial light. The output is usually quoted in terms of absolute output (flux), or per square meter on some illuminated surface (illuminance). This LM term, commonly referenced in technical literature such as testing guidelines[3] and industry reports[4], is used in the EU Regulation on Ecodesign[5].

Another mark of failure with respect to light output is a product's compliance with the EU Ecodesign Regulations. Performance requirements[6] say that: "The measured flux value at 25% of the rated life (with a maximum of 6,000 h) shall never be less than the maximum lumen maintenance value related to the rated life as defined and provided by the manufacturer or responsible vendor."

Dr Alan J Meaney is a co-founder of MetriLED Ltd, a spin-out from WIT research and supported by Enterprise Ireland. His background is in semiconductor physics, studying at DCU to PhD level and going on to work at the High-Magnetic Field Laboratory in The Netherlands.



This image illustrates what a drop in output looks like for a bulb. The flux of the bottom image is 70% that of the top. This bottom case would mean the unit has reached the end of its useful life.

I did say the definitions can be confusing! Essentially, this means that light output measured at 25% of the expected lifetime, or up to 6,000 hours, will always be more than the light output at end-of-life, when the LED light has faded beyond useful output. The responsibility lies with the manufacturer to say what percentage of initial output is expected at the end of life. It is worth noting that for this purpose, Irish legislation does not distinguish between manufacturer and importer[7]. The industry consensus is that LEDs emitting 70% or less of initial flux (light output) have reached their end of life.

A fall to 70% of the starting flux is significant but not always easy to notice. LED output diminishes gradually, over long periods of time. The image (top of page) illustrates what such a drop in output looks like for a bulb; the flux of the bottom image is 70% that of the top. This bottom case would mean the unit has reached the end of its useful life. To simplify we'll use "fail (ure)" as a collective proxy for the cumbersome terms. It is suitable for discussions here, and for many end-users, to say that a product has failed if it is not performing as expected.

Accurately estimating the time to failure, and hence expected lifetime of an LED, is notoriously difficult. How can we get a measured lifetime for products expected to last for decades? The typical approach applies a mathematical model[8] to 6,000 hours of data recorded under very particular measurement protocol. Measurements

My research at Waterford Institute of Technology with Dr Kieran O'Mahoney focused on a novel data processing method. Over 100 LED luminaires of varying models and designs were aged and measured over a total of 500,000 hours.

are taken at specific temperature, humidity, drive current, measurement frequency and orientation for LED packages, arrays or modules. That is anything from a single emitting diode and driver to a unit with all electrical, optical and mechanical components in-situ. These are not conditions of intended luminaire use.

Data from these kind of measurements are often used to produce expected lifetimes. The US Lighting Industry Alliance does not consider the behaviour of the LED package(s) as the dominant factor in determining lifetime, noting that manufacturers "... estimate product life for their own designs using data on principal components".

Moreover, they consider lumen maintenance as providing a baseline for depreciation of the luminaire system as a whole. Further US Department of Energy literature[9] reiterates the warning regarding potential misrepresentation of LED package lifetimes as that of the luminaire. They consider system failure a cumulative effect of all components, not just light emitters. "Characterisation of the useful life of an LED product must consider the possibility of catastrophic or parametric failure for each system component, operating together as a system".

So, we have several lifetimes to consider – component lifetime, not regarded as a good reflection for that of the LED luminaire expected lifetime; lifetime as quoted in product specifications, where the source is often unclear; and lifetime based on performance and measured output, which takes prohibitively long to acquire.

Independent testing using standard approaches or novel data processing methods remain the preferred options for providing realistic LED luminaire lifetimes. My research at Waterford

Institute of Technology with Dr Kieran O'Mahoney focused on the latter approach. Over 100 LED luminaires of varying models and designs were aged and measured over a total of 500,000 hours.

Our measurements showed a 20% failure rate. Failures ranged from indication of units not meeting regulatory compliance to vastly undershooting quoted lifetime and, in some cases, ceasing to output light completely. The failure rates we saw correspond well to lifetime-based failure rates of 18% found by *Which?*[10] UK. While failure rates of 1-in-5 may seem uncomfortably high, an EU-wide market surveillance report[11] found failure rates of nearly 60%.

Old Street Light Power	500 W
LED street light power	150W
Operating hours per year	4,380
Hours of expected lifetime	100,000
Price per kWh	€0.175

Frequent failures are unfortunately not limited to laboratory testing. While LED adoption, especially in public spaces such as street lighting, is still in its infancy in Ireland, data for US Gateway projects across a number of major urban areas are available[12]. LED lamps installed on the 8-lane I-35 bridge in Minneapolis, Minnesota had an expected >50,000 hour operation to LM70. However, outut had dropped by 20% after less than 20,000 hours of normal use.

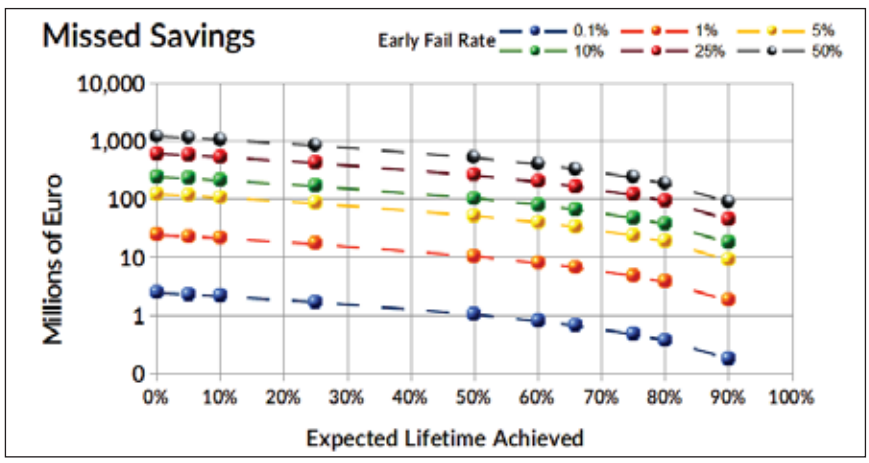


Figure 1: Potential missed financial savings due to early failure across the installation of 280,000 LED street lights as targetted in the Climate Action Plan 2019.

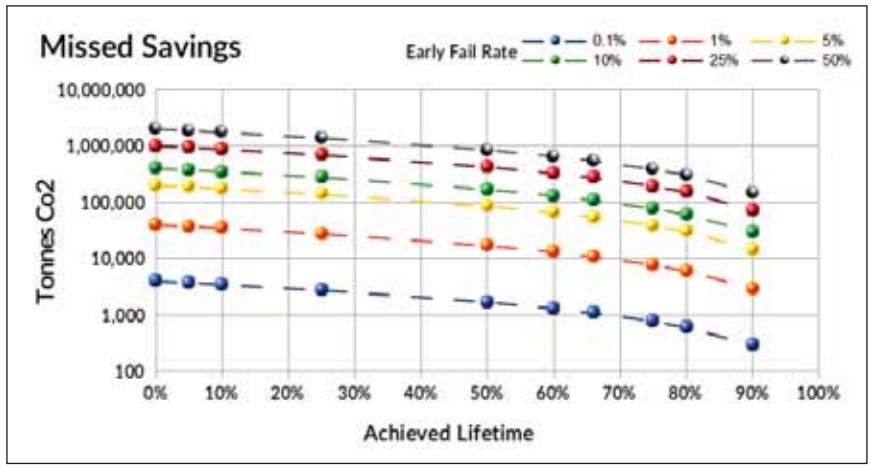


Figure 2: Potential missed carbon savings due to early failure across the installation of 280,000 LED street lights, as targetted in the Climate Action Plan 2019.

An installation at the border patrol area in Yuma, Arizona was measured to have an output drop of a massive 50% after just 11,000 hours. An even more remarkable story has been reported from Detroit, Michigan. After only three years, 30% of the retrofit LED street lights are reportedly dimming and burning out[13]. They were products from a reputable manufacturer with expected lifetimes of over 20 years, passing all ANSI and other industry checks. The result is ongoing replacement of the faulty street lights with a different model and a litigation by the Detroit Public Lighting authority against the manufacturer[14].

Premature failures in LEDs happen. We've highlighted already that savings are directly related to performance.

Old Light Power	60 W
LED light power	10W
Operating hours per year	2,200
Hours of expected lifetime	50,000
Price per kWh	€0.175

Let's look at some projects to illustrate this. Firstly, the (retro)fit of Ireland's street lighting to LEDs. The Climate Plan 2019 targets installation of 280,000 units by Q1 2020. We need some assumptions before we try any calculations though.

Wattage values are reflective of typical street lights. The operating hours are based on an average of 12 hours of darkness per day. While these figures are not precisely applicable to the project, they do allow for a reasonable impression of potential missed savings from our calculations. Now the technical bit.

We'll take missed savings to be expected savings, less realised savings, that is, if we expect a new LED to save us say €1000 over 100,000 hours of expected life and it fails at 50,000 hours, we miss half of our potential savings. Figure 1 shows potential missed savings for the Climate Action Plan installation of 280,000 LED street lights. We show early failure rates ranging from 0.1% to 50%. The time to failure ranges from "never worked" through to reaching 100% of expected lifetime. There are no missed savings

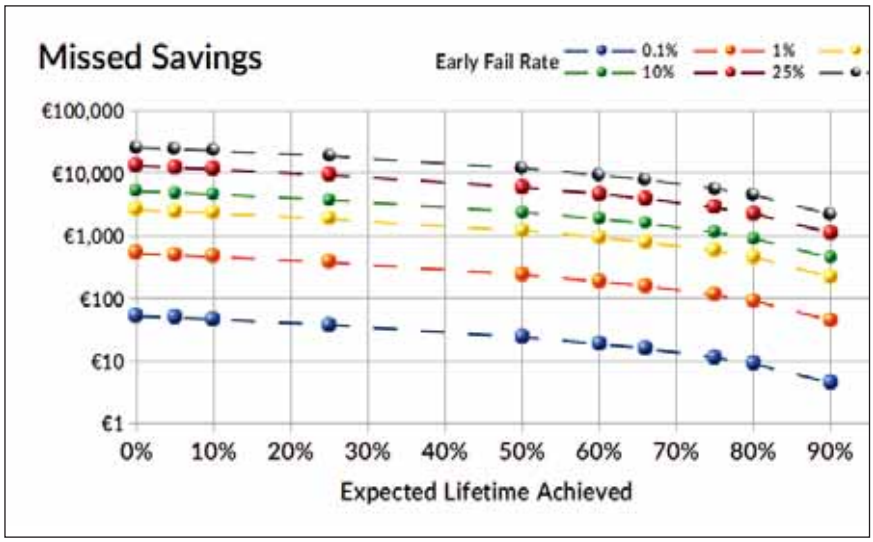


Figure 3: Potential missed savings due to early failure across an installation of 100 low power LEDs.

for units that get to 100% of their expected lifetime.

What failure rate may we expect? It's unlikely be to very high assuming good quality products are chosen. It is equally unlikely to be close to 0. In our model if just 1% of units fail at half of their expected life and 99% work perfectly, the missed savings will be €10 million. If 25% of the installed LEDs fail early, missed savings can run into the €100 million range. The missed savings applying to such disastrous failure rates as in Detroit amount to almost €1 billion over a 100,000 hour expected lifetime.

The point is not just to highlight what we may not achieve but also what we can achieve with high-quality, well-tested products with an accurate idea of expected performance. Roll-out of this project with reliable LEDs can contribute to a 4MT saving in Co2 emissions (Figure 2). The potential for failure is potentially more acute in low-cost products manufactured in very large quantities, often with a lower standard of quality assurance. We take an example of a small project, installing LEDs to replace traditional lighting in a public space or office. We assume they run for 10 hours a day over some 220 working days per year (Figure 3).

Low-cost LEDs such as may be used in this example have notoriously high failure rates. In such a project, even if 25% fail early and reach only 25% of their expected life, the missed savings still run into five figures. These are conservative figures for these kind of LED products. I've observed these kind of LEDs fail completely at less than 2,000 hours. They were specified to last for ten times that long!

LED products offer attractive savings in a number of ways, not least letting us know that we're doing something tangible for the environment. It would be remiss to ignore or not budget for potential failures. Inevitably, they will occur. Warranties may cover poorly-performing products but the terms can vary a lot, often with limits far shorter than the expected lifetimes.

When considering your LED products, whether it is at prototyping, purchase or installation, there are some steps that alleviate concerns regarding unexpected failures. These are:

- Check against regulations as to whether information on product spec sheets indicate compliance;
- Based on expected use, estimate how many years the lifetime claims it will last. Is it a realistic figure? Does it surpass the warranty term?
- Inquire with manufacturers to the nature of the lifetime claims. Are they based on component-level data, or that of the entire luminaire?
- Ensure financial or energy saving projections budget for early failures.

References

[1] European Environment Agency, *"Overview of Electricity Production and Use in Europe"*, ENER 038 (Apr. 2019)

[2] Sustainable Energy Authority of Ireland, *"Energy in Ireland: 2018 Report"* (Dec. 2018)

[3] Illuminating Engineering Society, *"Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays and Modules"*, ANSI / IES LM-80-15 (2015)

[4] Next Generation Lighting Industry Alliance with the U.S. Dept. Of energy, *"LED Luminaire Lifetime: Recommendations for Testing and Reporting"*, 3rd Ed. (Sep. 2014)

[5] European Commission, *"Commission Regulation (EU) No 1194/2012 of 12 December 2012 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for directional lamps, light emitting diode lamps and related equipment"* (Dec. 2012)

[6] International Electrotechnical Comission, *"LED Modules for General Lighting: Performance Requirements"*, IEC / PAS 62717:

[7] Statutory Instrument No. 454 of 2013 *"Europea Union (Ecodesign Requirements for Energy-Released Products) (Amendment) Regulations 2013"*

[8] Illuminating Engineering Society, *"Projecting Long Term Lumen Maintenance of LED Light Sources"*, IES TM-21—11 (2011

[9] U.S. Department of Energy, *"Building Technologies Program: Solid-State Lighting Technology Fact Sheet"* (2013)

[10] *Which?* UK *"Best Buy Light Bulbs"* (2014)

[11] European Commission Prosafe EEPliant Consortium, *"Market Surveillance for LED Lamps for the Domestic Sector"* (June 2017)

[12] U.S. Dept. Of Energy Solid-State Lighting Website: nergy.gov/eere/ssl/solid-state-lighting

[13] C. Feretti, Detroit News, *"Detroit's LED streetlights going dark after a few years"* (May 2019)

[14] Eastern District Court of Michigan, (2:19-cv-11327)

THE OBTUSE ANGLE

PAT LEHANE

Soundbites over substance?

Is it just me or has anyone else noticed the stream of "green" initiatives being announced by Minister Richard Bruton. The number of press releases on environment-related matters issuing from the Minister's Office has increased with noticeable regularity. Is it the election looming?

Also, the language and phraseology used by his PR team is at times lofty and convoluted. For instance, do you know that we now have "12 SDG Champions" to help realise the objectives of the Government's 17 Sustainable Development Goals?

What the current carbon/energy crisis calls for is clarity and realisable actions plans. So, less of the soundbites and more substance please.

Electricity production from the cold night sky

Scientists have recently developed an inexpensive thermoelectric device that harnesses the cold of space by way of a process called radiative sky cooling.

Billed as an "anti-solar" panel, it uses the change in the night temperature difference between the earth and outer space for power, rather than the sun.

A prototype of the device recently produced enough electricity at night to power a small LED light. A bigger version could someday light rooms, charge phones or power other electronics. Especially useful in low-resource areas that lack electricity at night when solar panels don't work.

Worth a Google.

Non-golfers at play during CIBSE outing

Ever wanted to know what those of us who don't (and can't) play golf get up to at the CIBSE Annual Golf Outing? Well, now you know. You might think health and safety considerations should prevent me standing on the back but trust me, if you knew how Michael Curran drives a golf cart you'd know that being in a position to jump clear is essential. That said, Paul Martin's driving is far worse, hence we refuse to let him drive. And anyway, quite apart from Mr Martin's erratic driving "skills", would you put your welfare in the hands of someone sporting socks like those?

30 years ago today …

Congratulations to Derek Elton, Managing Director of Wilo Ireland, who this year marks 30 years service with the company. I remember meeting him at the time of his appointment as Sales Support Engineer in 1989, and indeed the image I used at the time in the magazine. Sorry Derek, I simply could not resist carrying it again on this auspicious occasion.

Congrats Chris

Congratulations to Chris McClelland and his wife Anna on the birth of their baby daughter, Abina Lotty.

I hear Mom and baby are doing extremely well but have heard of no one enquiring after Chris. Me thinks the balance of power has definitively shifted in the McClelland household.

Seagrass carbon capture

An undersea meadow is to be sown off the Pembrokeshire coast in the UK as seagrass can apparently capture carbon from the atmosphere 35 times faster than rainforest vegetation. Bonus is that seagrass also serves as a nursery for marine life. Perhaps Minister Bruton and Minister Creed (Agriculture, Food & the Marine) should put their head together to discuss.

atlantic

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Panasonic
BUSINESS

ECO G

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Ideal when electrical supplies are limited
With a gas driven compressor that consumes 9% of the power of the ECOi VRF, the GE series is perfect for projects with limited electrical supply.

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The GE series utilises exhaust heat to help produce a constant flow of DHW which is perfect for hotels and other housing development applications.

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