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Welcome to this edition of ACR Journal! I've had the pleasure of being part of the judging process for the National ACR & Heat Pump Awards for the past few years, and I'm always amazed at some of the innovative technologies and applications submitted. This year was no different, and the shortlist of entries included in this issue demonstrates that. Remember, though, you can have the best product or project in the world, but if it is not put forward in a manner that does it justice, you give the judges very little to work with.



After a short absence, I'm pleased to reintroduce the Women in the ACR Industry feature. We thought it might be time to change this long-standing section, but it's back by popular demand with Meg Bradley of Vital Energi, winner of the Project Engineer category at the National ACR & Heat Pump Trainee Of The Year Awards. If you would like to nominate anyone for the Women in the ACR Industry feature, please let me know.

I hope you enjoy this edition.

*Andy*

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## Fernox marks diamond anniversary

Water treatment specialist Fernox is celebrating its 60th year in 2024 and says it remains committed to environmental efficiency.

With an operational base in Woking, Fernox has evolved into a global company that applies its knowledge to local

markets, providing a range of chemical water treatments and filters for both traditional and renewable heating systems. Recent examples include the TF1 Sigma HP Filter and HP-EG heat transfer fluid.

Fernox says it remains committed to training for installers and apprentices; continuing to lobby for the correct use of water treatment and implementation of industry best practice processes; and over the years has seen energy efficiency and environmental impact grow on the global and UK agenda.

"We are so proud to celebrate such an incredible milestone," said Ernie McDonald, Director at Fernox. "60 years strong and we have a great future ahead, with lots of innovations in the pipeline and exciting activities to celebrate our diamond anniversary.

"Although it's important to look back and acknowledge everything we have achieved, for the team this year, it really is all about the future – and we remain absolutely committed to the environmental efficiency agenda."



Fernox is celebrating 60 years

## Climalife teams up with Bristol City

Refrigerant specialist Climalife UK has signed a three-season deal to become Community Partner of EFL Championship football club Bristol City.

The Community Partner Programme gives local businesses the opportunity to align themselves with the club and the Bristol community.

Climalife Managing Director Allan Harper said "We are deeply proud of our part within an international business, but with our UK head office based in Bristol, we are always looking to find ways that we can give back and support our local communities. This partnership will be a wonderful opportunity for us to do so and we can't wait to get involved."

The Climalife branding will be used pitch-side and throughout the Ashton Gate stadium's concourses and hospitality areas.



## i-Chiller passes testing chamber challenge



ICS Cool Energy supplied a high performance cooling system for a leading manufacturer of testing chambers for automotive components.

Precision and reliability are paramount in this sector. Test chambers, used by many automotive OEMs, subject components to extreme conditions such as pressures, temperatures and vibrations to ensure their resilience in real-world scenarios. The automotive manufacturers have stringent demands for accuracy and dependability, which relies on cutting-edge test chambers to simulate real-world challenges.

The challenge faced by the manufacturer was centred around the cooling of compressors for its test chambers. While the chambers are equipped with a cooling function to facilitate testing in cold temperatures, the compressors required their own cooling to operate and create the desired, reliable and stable testing conditions. The set up of the chambers needed a solution consisting of a high-performance process chiller connected with flexible hose and capable to deal with high-pressure drops encountered in the test chambers.

ICS Cool Energy proposed its i-Chiller, which designed for challenging process conditions. What set this solution apart and made it an ideal choice for the customer was its designed-for-process technology and the ability to incorporate a 5-bar pump in the setup.

The i-Chiller not only provided the necessary cooling for the compressors but also addressed the unique challenges posed by the high pressure drops in the test chambers. Its adaptability ensured a seamless integration into the existing framework, showcasing ICS Cool Energy's commitment to tailored solutions.

By preventing the compressors in the test chambers from overheating, the i-Chiller significantly increased the reliability and temperature stability within the chambers. This, in turn, enhanced the overall performance of the component testing, providing the client with accurate and dependable results. In the automotive industry, this translates to reliable information enabling manufacturers to ensure their vehicles function optimally in all environments.

## Celebrating T Level Thursday with FETA

To mark T Level Thursday as part of National Apprenticeship Week, the Federation of Environmental Trade Associations (FETA) spoke to three students about their experience.

T Levels are an alternative to A Levels, apprenticeships and other 16-19 courses. Equivalent in size to 3 A Levels, a T Level focuses on vocational skills and can help students into skilled employment, higher study or apprenticeships. Each T Level includes an in-depth industry placement that lasts at least 45 days. Students get valuable experience in the workplace while employers get early sight of the new talent in their industry.

Ethan-John Yates, Ariel Lusala and George Knight are all part of the team at Southampton-based building energy management system (BEMS) controls specialist InTandem Systems, a FETA member, while pursuing T Level courses. George and Ethan are enrolled on a Building Services Engineering: Electrotechnical course, while Ariel is taking a course in Engineering Design and Development: Manufacturing.

Ariel first heard about T Levels during a school assembly, where they were described as a cross between A Levels and practical learning. He was thinking of studying A Levels but when his college told him they also offered T Levels he recalled that assembly. He said: "Since I liked doing a bit of both I thought, 'why not?'. I am now using the skills I learn in college in real life as well."

Explaining his reasoning behind choosing a T Level course after completing his GCSEs, George said: "I wasn't originally planning on going into a trade but then I realised I was quite keen to do something challenging, a bit more hands-on and a bit more practical. I saw a brief overview of my course and it covered everything I'm interested in. So I gave it a go, I stuck with it and am now really enjoying it."

Ethan described how important his industry placement with InTandem Systems has been in helping him progress from



From left, George Knight, Ethan-John Yates and Ariel Lusala at InTandem Systems

full-time learning to the world of work. He said: "It helps us understand how a company actually functions, because we're in the middle of it. Instead of being on the sidelines watching we're treated like a member of staff so we can get a feel of what it's going to be like in the future."

FETA Chief Executive Chris Yates said: "The success of the students at InTandem Systems is a great example of how employers can benefit from offering T Level placements and how the students themselves can gain valuable industry knowledge and apply the skills they learn at college to real world scenarios. It is fantastic to hear these stories and I hope they will inspire others to consider following a similar path."

## Podcast explores new UK Net Zero Carbon Buildings Standard

A podcast from Mitsubishi Electric focuses on the future of sustainable buildings and highlights the benefits of the new UK Net Zero Carbon Buildings Standard.



"By establishing a clear and measurable standard, the initiative aims to eradicate greenwashing and foster genuine sustainability efforts across the industry," explains Dan Smith, host of the podcast and Sustainability and Construction Manager for Mitsubishi Electric.

Mitsubishi Electric is a Gold Sponsor of the UK Net Zero Carbon Buildings Standard and believes that the quest for sustainability in the building industry has now reached a pivotal juncture with the emergence of this groundbreaking initiative.

The standard is aligned with other standards helping to signify a united front in the industry and setting out a clear course for achieving Net Zero carbon emissions.

In the podcast, Smith speaks with the Chair of the Governance Board of the standard, David Partridge, who provides insights into the development of the standard, its goals and future implications.

"Our conversation with David highlighted the critical role of collaboration, transparency, and innovation in this journey," added Smith. "As we move forward, the rule book for defining a Net Zero Carbon building which the Standard will define promises not only to guide the industry but also to transform the very foundations of sustainable building in the UK, shaping a greener and more responsible future for all."

The full podcast is available on Spotify (<https://spoti.fi/49Z6oQu>) or Apple (<https://apple.co/49VWpLp>)



## Airedale hands over biggest air-cooled chillers

Airedale by Modine has completed the delivery of 21 of its largest ever bespoke free cooling chillers, each 22 metres long and housing 36 fans.

The order, for an undisclosed data centre operator, is believed to be one of the largest single colocation orders taken by Airedale in its 50-year history. It consists of 21 of the super-sized chillers, two free cooling DeltaChill chillers (16-fan), 72 AireWall units, 12 SmartCool ONE chilled water downflow units and the Cooling System Optimiser, an on-site building management system offering an automated optimisation control package.

The data centre company has partnered with Airedale as part of its drive to meet its sustainability objectives. Working with the client, Airedale's data centre solutions engineering team has designed a larger derivative of their DeltaChill R32 free-cooling chiller to deliver maximum efficiency to meet on-site cooling demands.

Alongside the 36 high efficiency EC fans are 17 scroll compressors, selected due to their ability to deliver concurrent free cooling, maximising partial and full free cooling availability. The 16-fan variants are said to offer the same efficiencies and acoustic packages have been applied to all chillers to

ensure stringent noise constraints are met on site. The units all feature integral harmonic filtration, to increase quality, reliability and energy efficiency, by reducing loss in electrical components and deliver indirect energy savings. On such a large scale, these mitigations deliver tangible savings over the course of a year.

Airedale says one of its key differentiators is the ability to deliver a complete cooling solution, comprising not only high efficiency, free cooling chillers, but also the computer room air handlers (CRAHs), controls packages and on-site project management and installation teams.

Adam Yarrington, Business Unit Director for Data Centres at Airedale, said: "Delivering efficiencies that meet sustainability objectives and help us reduce the impact of mechanical cooling on our planet, is something we care deeply about at Airedale and is something we have continually strived to do, since before legislations around this were introduced.

"Working on a project of this complexity is really exciting for Airedale, as it allows us to demonstrate the scale of our capabilities, deliver meaningful efficiencies and push our technology to deliver more, which is absolutely achievable when taking a whole system approach."



## Aermec UK opens new HQ and northern European hub

Air conditioning manufacturer Aermec UK has officially opened its new HQ in Southend, which will also be a hub for business across northern Europe.



Alessandro Riello, CEO of Italian parent company Aermec SpA, joined Vice President Raffaella Riello for the ribbon-cutting ceremony. The opening was particularly poignant as the building is named after Giordano Riello, Aermec's founder, who died last May.

The 4,250sq ft custom-built facility has two floors of office space as well as capacity for a dedicated training room and a 2,007sqft warehouse. It will become Aermec's northern European hub and centre of excellence. Customers will benefit from on-line witness testing for controls and CPD courses that will complement Aermec's extensive facilities in Italy.

Paul Lawrence, Aermec UK Managing Director, said: "We are excited about this next new chapter for our business. Strategically located with excellent rail, road, and air links, Aermec's new premises will also aid our customer-centric business to better engage and serve customers better with purpose-built training facilities."

When choosing the location, Aermec SpA assessed customer access, proximity to London, ease of doing business and strategic ability to provide technical support, training, customer sales and business development.

## Europe approves F-Gas Regulation revision

The European Council has formally endorsed the revision to the F-Gas Regulation following its approval by the European Parliament.

With 457 in favour, 92 against and 32 abstentions, MEPs voting in Strasbourg approved a deal reached with the council to further cut emissions from fluorinated gases. In line with the EU's 2050 climate neutrality goal, the revision targets a total phase-out of hydrofluorocarbons (HFCs) by 2050, including a trajectory to reduce the EU consumption quota between 2024-2049.

It introduces strict requirements that prohibit placing on the EU market products containing F-gases and specific phase-out dates for the use of F-gases in sectors where it is technologically and economically feasible to switch to alternatives that do not use F-gases, such as domestic refrigeration, air conditioning and heat pumps.

The deal on reducing emissions of ozone-depleting substances (ODS) was adopted with 538 votes in favour, eight against and 13 abstentions. The law introduces requirements to recover and recycle such substances in building materials during renovations (found in particular in insulation foams), which is the main source of remaining ODS emissions in the EU. It also introduces strict exemptions for their use as feedstock (to produce other substances, for example in the pharmaceutical or chemical industry), as process agents, in laboratories and for fire protection.

Rapporteur Bas Eickhout (Greens/EFA, NL) said: "Putting an end to F-gases is crucial, not only because these gases are extremely harmful for the climate, but we are also providing clarity and investment certainty for industry. European companies are already at the forefront of developing clean alternatives to F-gases, so this law will be good for the climate and the European economy."

Rapporteur Jessica Polfjärd (EPP, SE) said: "The prevention of emissions from ozone-depleting substances is key in preventing adverse health and environmental effects resulting from a damaged ozone layer and contributing to greenhouse gas savings in line with the Union's climate target."

The F-Gas Regulation has now been published in the EU's Official Journal, entering into force 20 days later.

## IOR launches online masterclasses

The IOR has launched a monthly series of online masterclass webinars. Primarily aimed at supplementing teaching in training centres for those entering the industry, the sessions will cover topics related to the apprenticeship standard, end point exam content and also good practice and efficiency.

IOR President Graeme Fox said: "The IOR is keen to do more to support colleges and provide additional resources for anyone who wants to learn more about the basics of RACHP. The IOR's role is to help to bring colleges and industry together to share knowledge and best practice.

"Encouraging high standards in those new to the industry and supporting delivery of training programmes is one of the top priority areas our members have asked the IOR to focus on, and the masterclasses, along with free access to IOR publications for students and a new section of the FantasticFridges.com website for 16-21-year-olds, are all part of the new resources coming out this year to achieve this."

The free sessions will be broadcast live and recordings of each class will be added to the IOR website at [www.ior.org.uk/masterclasses](http://www.ior.org.uk/masterclasses), creating a valuable teaching and revision resource. Find out more about the programme for the IOR series and register to attend the live events using the same link.



## Starfrost offers freezing cost comparison service

Cooling equipment specialist Starfrost has introduced an energy comparison service designed to assist frozen and chilled food manufacturers in managing the ongoing rise in gas costs.

The tool is designed to help food processors assess the shift from cryogenic to mechanical freezing, said to typically yield a one to two year return on investment.



Starfrost says it can provide a comprehensive analysis of operating costs associated with mechanical and cryogenic freezing technologies, allowing processors to evaluate the financial implications of each option.

Samuel Welch, UK Sales Manager at Starfrost, said: "Our energy comparison service equips businesses with the essential insights needed to optimise their freezing and chilling processes and sheds light on real costs and payback returns. As a comparative example, the operating costs per kilo of finished product for mechanical freezing are notably 85-90% lower than those incurred with nitrogen cryogenics, an astonishing reduction.

"Our mechanical freezing equipment doesn't just deliver high-performance and high efficiency but also guarantees the highest quality results in the end product. We aim to share our expertise and emphasise a profitable freezing solution without compromising the food product's quality or sacrificing system flexibility."

To illustrate the effectiveness of the service, Starfrost recently collaborated with a prominent UK seafood processor. By investing in a mechanical spiral freezer and utilising the energy comparison service, the food manufacturer achieved substantial annual cost savings of £624,071 (based on 50 weeks of production, processing 1000kg per hour of seafood products).

The return on investment for this customer will be achieved in just over one year when compared to the operating costs of their previously used cryogenic freezer. For further information and a free cost comparison, visit:

<https://www.starfrost.com/starfrost-offers-cost-comparison-service-to-support-switch-from-costly-cryogenic-freezing/> or email [costcomparison@starfrost.com](mailto:costcomparison@starfrost.com)

## HRS golf back at Old Thorns



Hampshire Refrigeration Society's 37th Annual Golf Tournament is scheduled for Thursday July 25 at the Old Thorns Hotel, Golf and Country Club.

The day will begin with a 4-ball, 9-hole Texas Scramble, followed by breakfast/brunch in the Sports Bar, and the 18-hole Stableford tournament.

On completion of their round, guests can make use of the leisure facilities including the pool, spa or gym. Drinks will be available to purchase from 6.30pm in the Gatsby Ballroom, followed by dinner and prize presentation.

Organisers advise that event always sells out quickly. Anyone not on the HRS mailing list should contact Jayne Emm (jayne.emm@btinternet.com; 07979 208795) for a booking and sponsorship form.

The HRS has secured a number of rooms for a limited period. If guests wish to book for they should contact Old Thorns direct (01428 724555) before May 12, quoting the HRS Golf Tournament special rate.

## Ammonia cooling cuts energy use and emissions

Demeva Refrigeration has installed a high efficiency BITZER ammonia refrigeration system at Pilgrim UK's meat processing facility at Bromborough, Wirral, significantly reducing the company's energy costs and carbon emissions.

Energy costs for the previous cooling system were £146,000 a year, compared with an estimated £61,000 for the new system. This reduction of almost 60% was delivered alongside substantial savings in carbon emissions.

Demeva Refrigeration, based in Formby, Merseyside, specified a 707kW BITZER Ammonia Compressor Pack (ACP), powered by high performance screw compressors, to replace an end-of-life ammonia system by another manufacturer that had been in service for 20 years.

The existing ammonia charge was retained for use in the new system, further supporting the economic case for the upgrade.

The new system provides primary cooling at an evaporating temperature of -9°C for the site's secondary glycol circuit, serving cold stores at 2°C and air handling units at 8°C within the processing facility.

In the run-up to the replacement, the project leads from Demeva and Pilgrim UK visited BITZER's manufacturing and R&D facility in Stuttgart, Germany, to see the production process. Once the pack was installed, BITZER engineers from Germany attended site to assist with commissioning and ensure the plant was optimised to deliver the anticipated savings.

Other energy saving measures implemented at the site include replacement of the evaporative condenser for the refrigeration pack, installation of modern high efficiency glycol pumps on the secondary circuit, and a new Building Energy Management System to provide site-wide monitoring.

Kevin Glass, Managing Director of BITZER UK, said: "Ammonia refrigeration systems have traditionally been built as one-offs, often in less than ideal conditions. BITZER is able to build ACP units in a high quality factory environment, ensuring the highest possible system integrity, absolutely essential when working with ammonia."



The 707kW BITZER Ammonia Compressor Pack (ACP), powered by high performance screw compressors, at Pilgrim UK's Bromborough site

## Campbell West invests in the future

The owners of Bracknell-based HVAC specialist Campbell West have gone back to the future to strengthen the company's workforce and air conditioning offer.

Steven Campbell and Daniel West left school to become apprentice plumbers and have now shown their continued faith in the training system with a £10,000 investment in two members of the team.

Frank Smith and Tommy Gill have boosted their skillset by completing a 15-day new starter refrigeration course at Ellis Training in Hertfordshire, becoming certified F-Gas engineers in the process.

Director Daniel West said: "We are committed to ensuring we offer customers the highest possible standards which is

why we invest in our people, so they're equipped with the very latest skills and expertise.

"Steven and I are both products of the apprenticeship system which we still see as key to maintaining the company's growth. So we're delighted Frank and Tommy did Campbell West proud by passing this challenge with flying colours and we know they will enhance our air conditioning service."

The Refrigeration, Air Conditioning & Heat Pump Systems City & Guilds course mainly involves practical sessions, learning to use tools and equipment and installing systems. The pair will hone their new skills by carrying out some of the smaller air

conditioning installations Campbell West has on its order book.



Frank Smith, front left, and Tommy Gill, front right, with Campbell West owners Daniel West, left, and Steven Campbell



## CIAT selected for Oval Village

Seven hundred CIAT Comfort Line fan coil units (FCUs) were installed in the first phase of a new residential development at Oval Village, next to London's Oval cricket ground.

Berkeley Homes Central London is developing the 3.2 hectare site with 1,332 new homes across seven residential buildings, along with a new Tesco, more than 15,000 square metres of community, commercial, office and retail space in the London Borough of Lambeth.

The project is transforming the area into a cultural hub for residents and visitors through the regeneration of the iconic Oval gasholders built in 1847.

In the first phase of Oval Village opened in September last year, the 286 Manhattan apartments included CIAT's Comfort Line customisable HVAC solution. In conjunction with Epure air purification technology, the system treats particle pollution, ensuring a PM2.5 particulate concentration below the limit recommended by the World Health Organization (10 µg/m<sup>3</sup>).

Cameron Malcolm, Managing Director, Malcolm Building Services, said: "We chose the CIAT units because they could support the



simple control method specified. They redesigned the units to accommodate collapsible filters to assist with small access hatches, as well as extended drain trays."

CIAT provided a bespoke option with a customised, small folding filter due to the size of access panels in the residential properties. In addition, CIAT provided extended drain trays to accommodate the larger valve arrangements specified for the project. This ensures no condensation damages the ceiling via the enclosed ceiling void.

## Appliances Direct holding company prosecuted for breaching F-Gas regulations

Buy It Direct (BID), the holding company for Appliances Direct, has been fined £37,500 following legal action taken by the Environment Agency for breaching F-Gas Regulations.

Acting on information provided by F-Gas certification scheme REFCOM, in 2020, the online sales company was found to be in breach of F-Gas Regulation Article 11 Paragraph 5, which seeks to ensure that non-hermetically sealed equipment charged with fluorinated greenhouse gases shall only be sold to an end user whereby installation is to be carried out by someone holding a valid F-Gas handling certificate or F-Gas registered contractor.

According to the Building Engineering Services Association (BESA), which operates REFCOM, BID chief executive Nick Glynn had argued in the company's defence that purchasers "could not proceed to actual purchase without agreeing contractual terms which included installation by a relevant qualified engineer."

Prosecutors dismissed these claims because there was "no evidence that the installation will be properly carried out", and the judgement found that 94% of Appliances Direct's sales to end users lacked evidence indicating compliance with regulations.

Graeme Fox, Technical Director at BESA, said: "This is a landmark prosecution that sets a precedent for anyone trying to circumvent these important public safety regulations using online sales platforms. REFCOM and its members have been raising the alarm about online sellers for several years as they represent a vulnerability in the system that can lead to equipment falling into the wrong hands. Most distributors and wholesalers are fully aware of their responsibilities and ensure they receive confirmation of safe installation before selling refrigeration and air conditioning equipment, but we remain vigilant for any that might seek to act irresponsibly for profit.

"We will continue to work hard on behalf of the industry and its customers to ensure only properly trained, qualified and registered individuals and companies carry out this important work."



## Aermec employees celebrate long service

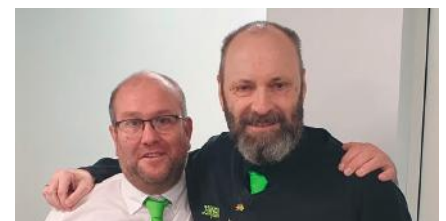
Two Aermec employees with over 35 years of service between them have been recognised for their achievement.

Contracts Manager Ray Miller started at Aermec 15 years ago and Technical Field Service Manager Craig Harding has been with the business 20 years.

Their service was recognised at the recent opening of Aermec's new UK headquarters in Rochford, where a reception was hosted by Paul Lawrence, Managing Director, Aermec UK.

He said: "Our people are vital to our success. Ray and Craig's dedication has helped Aermec to grow over the years and they deserve recognition for their work. Aermec is very much a family business, and we are proud to recognise our employees and celebrate with them."

A presentation was made by Aermec Vice President Raffaella Riello and CEO Alessandro Riello.



Aermec's Craig Harding, left, and Ray Miller

# Universities measure carbon footprint of contractors

Aston University has signed up for a new method of measuring its contractors' carbon footprint.

The Net Zero Carbon Supplier Tool was developed by NETpositive Futures in collaboration with Nottingham Trent University. The tool is designed to help universities to calculate the carbon footprint of their supply chains, helping them and their suppliers to meet net zero carbon targets.



Another 29 higher education institutions have already signed up, along with Aston University.

By collecting supplier-specific carbon footprint data, universities can report on the sustainability impact of the goods and services they purchase, as well as track reductions in emissions when sustainability interventions are implemented.

It provides institutions with their supply chain carbon emissions data but also proactively targets and influences suppliers to reduce their own carbon emissions.

Aston University's Head of Procurement and Insurance, Neil Bayliss, said: "The university's 2030 strategy sets out to contribute to the net zero agenda and the overall transition towards a greener economy.

"One way we will do this is by actively supporting businesses in adopting sustainable practices and business models to achieve net zero emissions and this new net zero tool will help us to encourage suppliers to make greener choices."

The online tool uses sector-specific carbon footprint calculation methodology to help universities to understand how suppliers are responding to the shared challenge of climate change and support them in taking actions to progress net zero in their own businesses.

Suppliers are provided with an estimated carbon footprint and a bespoke carbon reduction plan free of charge. Regardless of how many universities they do business with, only one account is needed as the data is shared.

By completing some simple steps, suppliers who already know their carbon footprint and have committed to take action can share this with multiple universities via the tool.

# Oceanair acquired by MKM

Specialist air conditioning and heat pump distributor Oceanair UK has been acquired by leading independent builders' merchant MKM.

Established in 2002 and with premises in Mansfield and Crawley, Oceanair supplies HVAC equipment from brands including Daikin, Fujitsu and Panasonic.

Kate Tinsley, CEO of MKM, said: "This is an interesting acquisition for MKM and enables us to expand into further emerging marketplaces; Oceanair is a great company with very talented people. I'm really excited about our growth plans."

MKM says Oceanair will continue to operate under its existing name, ensuring continuity for both customers and suppliers. Tony Evanson, the owner of Oceanair, will remain involved in the business for the foreseeable future providing support during the transition.

Evanson said: "I'm incredibly proud to see the business grow over the years and have developed some fantastic relationships with staff, customers, and suppliers. I have thought long and hard about selling the business

and was adamant it needed to go to the right home. I'm very pleased to be around the business to support the MKM team and look forward to seeing Oceanair grow under its new ownership".

Rob Barnes, MKM's Business Development Director leading the acquisition, said: "This acquisition fits perfectly with MKM's plans for expansion, allowing us to branch out further into the HVAC industry. Continuing to work closely with the current Oceanair team guarantees a seamless transition, customers and suppliers can expect business as usual.

"Oceanashp.co.uk, part of Oceanair, specialises in heating and concentrates on designing, supplying, commissioning, and supporting air-to-water heat pumps. Their Heat Pump Training Academy conducts courses on design and installation and has recently earned recognition as a "Centre of Excellence" by Panasonic. This fits perfectly with our commitment of offering more sustainable options to customers."

Established in 1995, MKM has grown to become a key player in the UK building and construction industry. It not has branches across England, Scotland and Wales, and a turnover of around £1 billion.



Rob Barnes of MKM, left, with Oceanair's Tony Evanson



## MHI named Beijer Ref Supplier of the Year

Mitsubishi Heavy Industries (MHI) has been named Beijer Ref UK & Ireland Supplier of the Year for the second time.

The award was presented at the annual Beijer Ref Supplier Dinner in York, which was attended by many members of the group's key supply chain from the UK and further afield.

Pictured, Beijer Ref Managing Director John Billson presents MHI Managing Director Ryoichi Kariya with the award, watched by, from left, Louis Sullivan and Fernando Martinez (MHI), Greg Cattell (Beijer Ref) and Shingo Matsukura (MHI).



# AquiTron AT-SRG

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**15+ YEAR LIFETIME, NO CALIBRATION REQUIRED**

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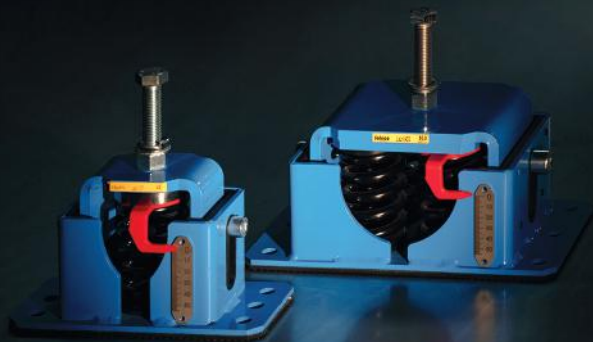
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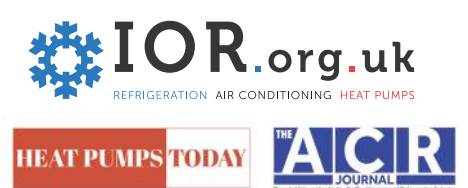
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The Climalife Roadshow will also be open from 8am – 10am in the Jack Charlton Suite (West Stand). Refreshments and breakfast rolls will be available on arrival. You can register to attend at: <https://forms.office.com/e/rMhEAXrdfP>



# One sensor – One tool!

Following on from last month's TOOL TALK about the BOSCH RG-4.0 recovery machine, and the increased use of Hydrocarbons in the cooling industry – we would like to introduce you to the BOSCH CS LD 1.0 leak detector.

Electronic leak detectors have been used in the industry for many years and are a reliable way of pinpointing leaks. Standard refrigerant leak detectors are not suitable for use with Hydrocarbons, and a hydrocarbon leak detector is not suitable for use with the common everyday halogenated refrigerants. This unfortunately results in the contractor having to carry two separate (and sometimes costly) leak detectors.

### Innovation from BOSCH

This innovative tool straight out of the BOSCH factory focusses on the fact that engineers now need the flexibility to detect leaks from both traditional refrigerants as well as Hydrocarbons.

The CS LD 1.0 detects standard refrigerants, A2L refrigerants, Hydrocarbons, Ammonia, and Tracer gas – and has rightly earned the strap line “one sensor – one tool”!

### Saving time and expense

The CS LD 1.0 features an LCD display with two different modes:

- SCANNING MODE – indicates the leak size
- PINPOINT MODE – allows the user to see the exact point that the leak is detected



The CS LD 1.0 boasts a sensitivity for standard refrigerants of less than 1gr/yr – this makes it one of the most sensitive and accurate leak detectors on the market.

The Bosch CS LD 1.0 is available from leading wholesalers and is backed by a UK-based Service Centre.

See more...

<https://www.pumph.co.uk/product/bosch-cs-ld-1-0-leak-detector/>  
or contact our sales team on [sales@diversitech.com](mailto:sales@diversitech.com)

SPECIFICATIONS	
Dimensions (L x W x H)	218 x 83 x 51 mm
Probe Length	413 mm
Weight	452 grams
Sensor Life	Approximately 5 years under normal usage
Warm Up Time	Normally 20-30 seconds (45 seconds MAX)
Ultimate Sensitivity	< 1 g/yr
Power Supply	Li-Ion rechargeable cell
Battery Life (per charge)	8 hours
Recharge time	≤ 3 hours
Operating Temperature & Humidity	-20°C to 50°C - 95% RH MAX
IP Rating	IP IP51

TEST RESULTS	R-134α	R-1234yf	R-290
Static lower detection limit (g/a) <sup>1</sup>	1 g/a	1 g/a	0.5 g/a
Dynamic lower detection limit (g/a) <sup>1</sup>	1 g/a	1 g/a	0.5 g/a
Dynamic lower detection limit in a contaminated environment (g/a) <sup>1</sup>	12 g/a	10 g/a	4 g/a
Response time (s) <sup>1</sup>	0.5 sec	0.5 sec	0.5 sec
Zeroing time (s) <sup>2,3</sup>	-	-	-
Recovery time (s) <sup>2</sup>	14 sec	10 sec	6 sec





# FINALISTS 2024

The much-anticipated National Air Conditioning, Refrigeration & Heat Pump Awards 2024 will be held at The Midland, Manchester on March 21st, giving the industry a welcome opportunity to recognise outstanding people, projects and products.

## CONGRATULATIONS TO:

### ACR CONTRACTOR OF THE YEAR

- The RACA Group
- SURE Solutions
- Cross Group Ltd

### AIR CONDITIONING PRODUCT

- HMS Networks  
700 Series Air
- Hitachi Cooling and Heating  
Hitachi Air365 Max VRF
- Carrier  
Carrier IdroFan® 36XH Hybrid Hydronic Terminal
- Toshiba Air Conditioning  
DAISEIKAI 10 by Toshiba Air Conditioning

### REFRIGERATION PRODUCT

- BITZER UK  
AMChill Ultra-low Charge Ammonia Chiller
- Testo Ltd

### AIR CONDITIONING PROJECT

- CIAT  
Seagreen offshore wind farm project
- Personal Refrigeration Ltd  
Rice Cook Ventilation & Cooling Project
- Organic Heat Exchangers Ltd  
Cool Net Zero Project
- Personal Refrigeration Ltd  
Air Handlers Northern. London Vet Specialists Project.
- Panasonic Heating and Cooling  
Riverdale Healthcare

### REFRIGERATION PROJECT

- BITZER UK / Chillflow Solutions Ltd  
Bespoke R-449A Refrigeration System for 65m Ice Breaker
- BITZER UK and G&O Refrigeration Ltd  
Lee Valley Ice Centre
- Personal Refrigeration Ltd  
Harlech Foodservice Ltd  
Freezer Upgrade & Replacement Project
- Panasonic Heating and Cooling  
Keep it Cool and Hawco Ltd
- WAVE Refrigeration  
Bidfood Glasgow Depot
- Sure Solutions  
Little Moons  
NEW MOON PROJECT
- Beijer Ref UK & Miramar Engineering  
JJ Food Services installed by Miramar Engineering supported by FridgeHUB
- Cross Refrigeration (NI) Ltd  
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- Meridian RACHP Training  
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- Grant Engineering (UK) Ltd  
Grant UK Training Academy
- Heat Geek
- South Hampshire College Group  
Eastleigh College Heat Pump Training Provision
- McFarlane Telfer Ltd  
MCFT

### WHOLESALE/DISTRIBUTOR

- Smith Brothers Stores Ltd
- Cool Designs Ltd
- Nuenta

### HEAT PUMP INSTALLER

- R A Brown Heating Services Ltd
- Castle Climate Control Ltd
- RPS Group (Rothwell Plumbing Services)
- Oxon Energy Ltd

### HEAT PUMP PRODUCT DOMESTIC

- Ebac Ltd
- Ecoforest  
ecoGEO+ PRO
- Ideal Heating  
Logic Air
- Panasonic Heating and Cooling  
Panasonic Aquarea R290 L Series Air-to-water Heat Pump
- Mitsubishi Electric  
Mitsubishi Electric Ecodan R290
- Clivet Group UK  
Edge EVO 2.0
- Nuenta Ltd  
ecoAIR+ EVI 4-20kW
- Nuenta Ltd  
ecoGEO PRO 1-6kW
- Warmflow  
Warmflow Zeno air source heat pump
- Viessmann  
Viessmann Vitocal 150 / 151-A  
Air Source Heat Pump
- Strom Limited  
Strom Vertex HP

THANK YOU TO



THE NATIONAL ACR & HEAT PUMPS AWARDS





#### HEAT PUMP PRODUCT COMMERCIAL

- **Solid Energy**  
Solid Energy  
Modular HC Heat Pumps
- **Carrier**  
Carrier AquaForce® 61CA air-source heat pump
- **Clivet Group UK**  
ELFOEnergy Storm EVO
- **Solid Energy**  
DH Sub Station Heat Pump 200kW  
5MW
- **Swegon**  
BlueBox OMICRON Zero

#### GROUND SOURCE PROJECT

- **Ecoforest**  
Daly Renewables single house installation
- **R A Brown Heating Services Ltd**  
Ground Source Heat Pump in The Old Rectory
- **Calibrate Energy Engineering**  
2-phase 3 Megawatt Modified Capacity GSHP  
in Scotland

#### DOMESTIC AIR SOURCE PROJECT

- **R A Brown Heating Services Ltd**  
New Build Family Home in Norfolk
- **Panasonic Heating and Cooling**  
Panasonic Delivers sustainable Warmth to EPC  
A-rated Home, Wakeman heating & renewable  
and Dovecote homes
- **Ability Energy UK**  
ASHP Development in Scottish Borders
- **Viessmann**  
EPC Improvements & Viessmann

- **Viessmann**  
Blakemore Plumbing & Heating and Viessmann
- **Viessmann**  
Heat Different and Viessmann
- **Batchelor Air Conditioning & Refrigeration Ltd**  
Batchelor makes a splash with multi zone  
pool project

#### NON - DOMESTIC AIR SOURCE PROJECT

- **Carrier**  
Glasgow Bank Estate
- **The Bruce Boucher Consultancy**  
Weleda World Leader in Natural Cosmetics  
and cures
- **RPS Group**  
Decarbonisation of Wallesy Hub
- **ICG HEAT PUMPS**  
Kirkby Leisure Centre
- **Mitsubishi Electric**  
Decarbonising hot water in The Gym Group's  
Leyland site
- **Calibrate Energy Engineering**  
Water Research Centre Phase 1 Energy  
Transformation Project

#### ANCILLARY PRODUCT OF THE YEAR

- **Discrete Heat**  
ThermaSkirt
- **Discrete Heat**  
ThermAssured
- **Grant Engineering (UK) Ltd**  
Grant EvoLink Hybrid System Hub
- **Grant Engineering (UK) Ltd**  
Grant Aerona Smart Controller

- **SAMON**  
GLACIÄR MIDI Refrigerant Gas Detector
- **WAVE Refrigeration**  
Theoretical Performance Calculator

#### BEST IAQ INNOVATION

- **Martin Industries Ltd**  
AirX Pro
- **CIAT**  
CIAT EPURE® Filter

#### RACHP WOMAN OF THE YEAR

- Publishers vote

#### PHIL CREANEY'S ACR CHAMPION

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# Beyond Wi-Fi:

## AI is the future of AC and the time is now

Ran Roth, CEO and co-founder of climate tech IoT company Sensibo, on the need for the industry to embrace the benefits of artificial intelligence.

In an era defined by the pressing need to address climate change, one of the most significant contributors to energy consumption is often overlooked—the ubiquitous air conditioner (AC). The key to addressing this issue lies in the synergy of AI and cutting-edge technology, which also will assist brands to differentiate themselves from competitors, create new revenue, enhance customer loyalty and the ability to upsell. In addition, AI-infused smart ACs have the potential to revolutionise the industry by optimising energy consumption, improving efficiency, and ultimately mitigating their environmental impact.

While Wi-Fi connectivity has enabled remote control and monitoring of AC units, it falls short of realising the full potential of smart technology. AI-driven smart ACs can learn from user behaviour over time, customising settings to individual preferences automatically. This level of sophistication goes beyond the capabilities of basic Wi-Fi connectivity, offering a truly intelligent and user-friendly experience, assisting in customer loyalty.

According to the International Energy Agency (IEA), 25% of the world's energy is consumed by heating/cooling devices. As temperatures rise globally and the demand for cooling solutions intensifies, the



Ran Roth

environmental impact of traditional AC units becomes increasingly alarming. While the integration of Wi-Fi capabilities has marked a step forward in connectivity, it is high time for AC manufacturers to embrace artificial intelligence (AI), Big Data, Machine Learning, sensors, and advanced technologies to create a new generation of smart air conditioners that go beyond mere connectivity.

### New industrial revolution

The climate is becoming more extreme, and Sensibo's data shows that the average customer uses their heating and cooling devices 43% more compared to the past 5 years. Around the world there are nearly 1.5Bn air conditioners, while Sensibo has found that 37% of users forget to turn the AC off at least once a week. We are in the midst of a new wave of the industrial revolution, powered by data and IoT: how will AC brands and manufacturers leverage these innovations to reduce CO<sub>2</sub> emissions, while creating new revenue streams and completely changing the perception of end customers about their brand?

Traditional air conditioners, despite their efficiency in cooling and heating, are notorious for their energy consumption, leading to substantial carbon emissions. The use of air conditioning has a significant impact on the environment. According to the US Department of Energy, air conditioning's energy consumption results in the release of 117 million metric tons of CO<sub>2</sub> into the atmosphere every year.

AI-driven smart AC can learn from user behaviour over time, customising settings to individual preferences automatically



AI's most recent development, ChatGPT, can be used in this smart AC revolution: ChatGPT was created by OpenAI, an AI and research company. It is an advanced language model that uses a deep learning architecture called transformers. Sensibo, the leading Climate Tech IoT company combining smart heating and cooling devices with a more sustainable world, uses ChatGPT to suggest recommendations based on the user's behaviour patterns, such as an automated AC schedule based on custom behaviour of the user. Leveraging the power of advanced AI promises to augment user experience and boost energy efficiency, marking a notable stride towards sustainable living.

In addition, AI-powered sensors enhance the precision of temperature control within a given space. By continuously analysing data on room occupancy, external weather conditions, and user preferences, smart ACs can dynamically adjust their settings to maintain optimal comfort without unnecessary energy expenditure. This intelligent adaptation not only reduces energy consumption but also leads to significant cost savings for consumers.



### Enabling predictive maintenance

Moreover, AI algorithms can enable predictive maintenance, identifying potential issues before they escalate into costly repairs, thus reducing visits, costs and having the right parts needed for repair. Predictive maintenance can also provide quantitative information to the end user informing them about the benefits of replacing their old unit with a new, more energy efficient equipment.

Furthermore, the integration of machine learning algorithms can facilitate demand response capabilities. Smart ACs can collaborate with energy grids to optimise cooling cycles during periods of low demand, contributing to a more stable and sustainable energy ecosystem. This not only benefits individual consumers by potentially reducing electricity costs but also alleviates the strain on the overall energy infrastructure. Moreover, the data collected by AI-infused smart ACs can be harnessed to generate valuable insights for energy planners and policymakers. Aggregated and anonymised usage patterns can help identify trends in energy consumption, inform the development of targeted energy efficiency programmes, and guide the planning of future energy infrastructure investments. This data-driven approach empowers decision-makers to make informed choices that reduce the load on grids, such as the recent struggle that ERCOT experienced in Texas this summer, while demand exceeded previous records for 42 days in the summer of 2023.

Recently, Sensibo's vision became a reality when we launched Sensibo OS for AC brands and manufacturers that are looking to infuse AI into their technology and differentiate themselves with smart technology that other players have failed to offer. We commenced an important partnership with a leading AC manufacturer, integrating Sensibo OS into their air conditioners and heat pumps, allowing their customers to control their

devices from anywhere using Sensibo's suite of mobile smart AC functions such as smart scheduling; geo-fencing; climate react; and voice control. Customers will also be able to take advantage of Sensibo's machine-learning algorithms to help them conserve



energy and enjoy greater comfort and control. This use case is a true win as the AC manufacturer is providing its customers with an enhanced customer experience with a plethora of mobile features, alongside creating new revenue streams and a brand enhancement. For this vision to become a reality, collaboration between AC manufacturers and tech companies is essential: manufacturers and tech companies must collaborate on research and development to bring these advanced solutions to market.

### Real-time adaptation

The integration of AI in smart ACs also aligns with the broader trend of the Internet of Things (IoT) and interconnected devices. These systems can communicate not only with each other but also with external environmental sensors and weather forecasts. This level of connectivity allows smart ACs to anticipate temperature fluctuations, adapting in real-time to create more energy-efficient and environmentally friendly cooling solutions.

In conclusion, the imperative for AC manufacturers to embrace AI and advanced technologies extends beyond the realm of connectivity. Smart ACs, powered by artificial intelligence, data, machine learning and sensors hold the key to a more sustainable future by reducing energy consumption, minimising environmental impact and providing consumers with unprecedented levels of comfort and control. The industry is ushering in a new era of climate-conscious solutions which are creating business value and new revenue streams. Those who adopt these technologies will charge forward, and those who do not embrace them will be left behind.



# Plenty of opportunity in renewable heating

Ben Bartle-Ross on why more engineers from the commercial side should be looking to widen their reach.



Ben Bartle-Ross is a technical trainer at Mitsubishi Electric.

As a heat pump trainer, I'm meeting more and more gas engineers who are adding renewable heating skills to their portfolio because they realise that we are very near the end of gas.

A lot of these are focusing on the residential market, which is just as well as the government has set a target for the industry of installing 600,000 heat pumps a year and we are nowhere near that yet.

But I'm not seeing enough engineers on the commercial side look at the opportunities to build their business which surprises me because the scope for both carbon reduction and business success is huge.

## Residential is not enough

There are an estimated 27 million homes in the UK and around 2 million commercial buildings. All of them need heating and hot water.

Around 80% of existing buildings will still be in use by the time we get to 2050, which equates to around 21.6 million current homes and 1.6 million existing commercial buildings.

Whilst the news seems to focus on the need for 600,000 heat pump installations a year, this is only talking about domestic installs and forgets the carbon-reduction and energy savings from the commercial sector.

In very simplistic terms, the average home would probably need a 5kW heat pump which, for 21.6m houses equates to 108m kW of heating.

Fitting 600,000 a year would mean 3m kW each year, which means it will take 36 years to get all of these homes doing what they need to. We only have 26 years until the 2050 target!

## The role of commercial heating

I spent some time looking at commercial installations that we've been involved in over the past year, and these range from an

80kW CAHV heat pump for a sports centre to a large 556kW system for the entire science block at the University of Salford.

If we average out the requirement for a commercial building to 150kW of heating and hot water and multiply that by the 1.6 million existing commercial buildings, that equates to 240m kW of heating.

That in turn equates to over 9m kW a year, over the next 26 years so, in many ways, commercial heating offers a clearer and simpler route towards net zero... and significant business for any commercial heating engineer who is ready to capitalise on the opportunity.

You may say that 150kW is more than the average commercial building needs, but even if we average this out at 100kW, that still amounts to 160m kW of heating, which is still more than 6m kW a year over the next 26 years.

That's a lot of carbon saving over the gas boilers that the heat pumps will replace!

So, whichever way you look at it, there is a huge amount of scope for carbon reduction in the commercial sector.



## Decarbonising public buildings

The Public Sector Decarbonisation Scheme, otherwise known as 'Salix Funding' after the company administering the scheme, is really starting to make a difference.

Now in its fourth phase, the scheme is heavily oversubscribed each time it opens

for applications. However, each year of the scheme means more and more council offices, schools, libraries, museums and other public spaces benefit from renewable systems that replace their aging, carbon-heavy gas and oil heating.

According to the gov.uk website the last phase of £230 million in October 2023 will not only help to decarbonise the public sector with low carbon heating and energy efficiency measures, it is also expected to save the public sector an estimated £650 million per year on average to 2037.

## Decarbonising commercial buildings


At the same time, commercial building owners are now starting to realise that they are in danger of being left behind if they do not focus on decarbonisation and renewable heating.

A growing body of legislation on reducing energy consumption and delivering decarbonisation of heat in commercial building stock is putting some existing buildings in danger of becoming what are known as 'stranded assets'.

Owners of older buildings face significant costs associated with meeting higher standards for Energy Performance Certificates (EPCs) and are trying to avoid any disruption from swapping out gas for heat pump.

Yet their buildings will fall further behind environmental requirements every year, leaving them unlettable, with a shrinking sales value.

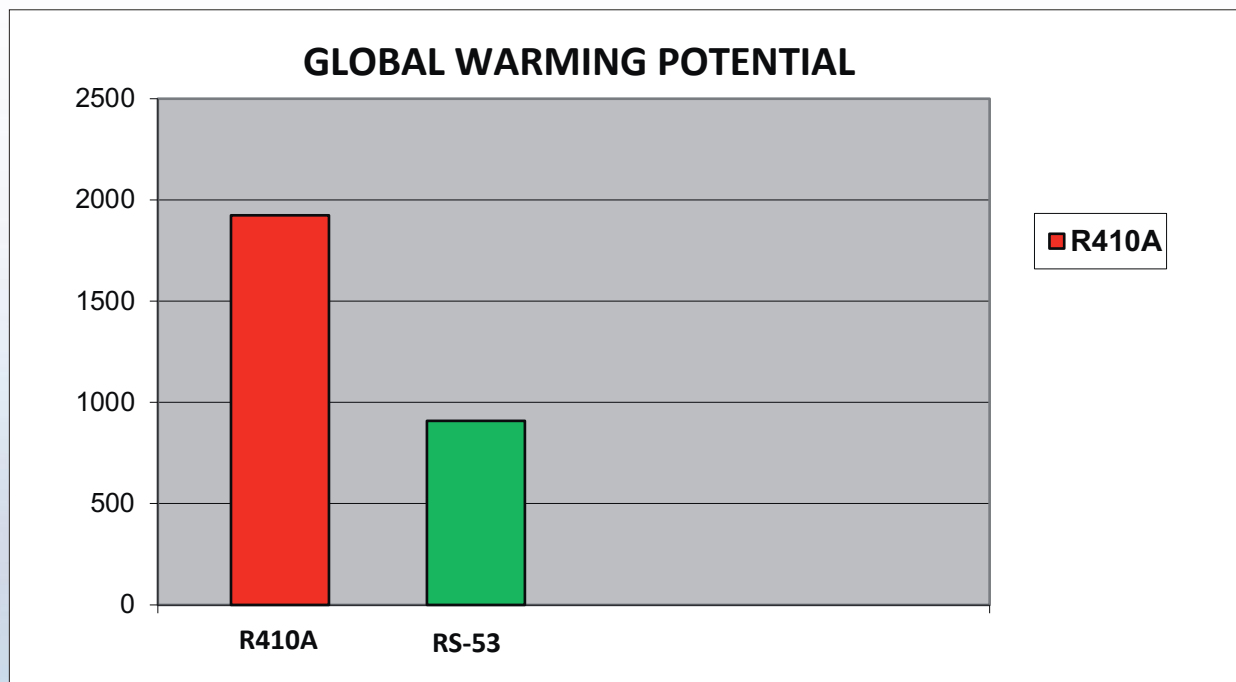
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# It's time to plan for the future

Are you confused about F-Gas or PFAS? Do you understand the longer-term implications of phasedown? Neil Roberts of Climalife discusses the information currently available and why it is enough to be making key decisions.



Neil Roberts, Climalife

As we all know there are significant changes coming for our industry, but as of mid-February 2024, Great Britain (GB) is still in the process of developing its revised regulation for implementation in 2025 and the European Union (EU) is in the final stages of introducing a revised regulation. It would be easy to just sit back and say let's wait to see what develops, but this is a mistake as there is a lot of information available to enable strategic decisions to be made which will allow an orderly transition from higher GWP refrigerants to low (<750 GWP) or very low GWP (<150 GWP). So, what do we know?

## European Union F-Gas Review

Even though GB no longer follows the EU F-Gas legislation, the EU review process is more advanced than the GB process and may have an influence on what the final GB regulation looks like. The final votes to

approve the text of the EU revision were completed during January and publication in the EU Official Journal is expected in late February/early March. The new regulation will come into force 20 days after publication. The revision introduces several additional maximum GWP limits for new equipment being proposed for different applications, further GWP limits on refrigerants for maintenance of some applications and a very accelerated tonnes CO<sub>2</sub>e HFC phasedown that will continue to reduce well beyond the current 2030 phasedown schedule. The current HFC phasedown schedule reduces the TCO<sub>2</sub>e to 21% of the 2015 baseline level by 2030, but the new proposals will reduce TCO<sub>2</sub>e to 5% of the baseline by 2030 with a complete phaseout of HFCs by 2050. HFO refrigerants such as R-1234yf and R-1234ze are not included in this phasedown and eventual phase out. It is very clear that the new legislation will require the move

to low or very low GWP options for new equipment sooner rather than later. For more on the EU GWP restrictions, information on other details and what refrigerant options are compliant with the new EU regulation, contact Climalife.

## Great Britain F-Gas Review

The government department dealing with the F-Gas revision in GB is Defra. Defra has stated that there will be no new F-Gas legislation in GB until 2025 and have also publicly stated that "Any changes we might propose will be focused on the needs and opportunities specific to the GB market". Defra has held numerous public and private stakeholder meetings and are still defining the detail of the revised GB regulation. As yet there is no firm indication of what the GB regulation will say but a report published by Defra in December 2022 included the chart in Figure 1, giving different scenarios. It is clear from the discussions with Defra that the final decision will be challenging to the industry unless the move to low or very low GWP is taken sooner rather than later. It is worth stating again that the GB F-Gas revision is completely independent of the EU process, any accelerated phasedown will not be introduced until 2026 and there is likely to be significant alignment with the EU regulation where it is thought the proposed measures are achievable. It is vitally important that the GB industry participate in the public consultation to ensure a workable proposal goes forward for the future legislation.

Figure 1

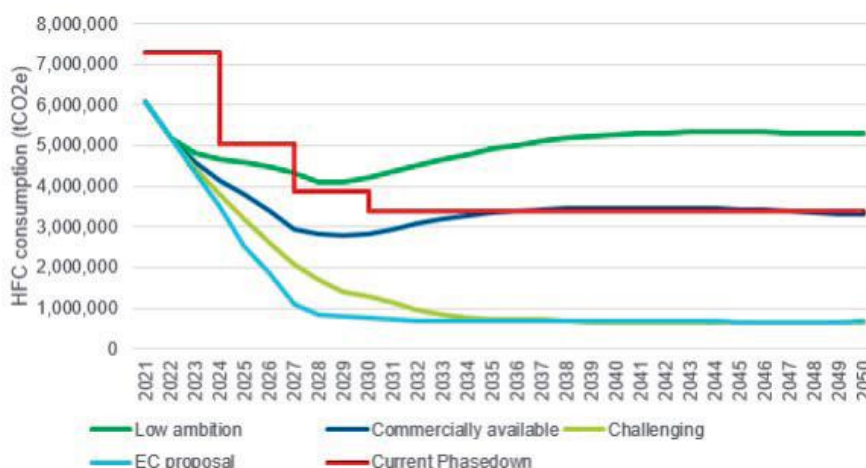


Figure 1 - GB F-Gas Review Report phasedown scenarios\*

## What about PFAS?

PFAS is an extensive subject, and we don't have the space to go into too







much detail here. For those who want the full picture there is an article and recording of a webinar available, but here are the key points. PFAS has a definition that encompasses a very wide range of chemicals based on a particular chemical structure being present in the molecule. All fluorinated refrigerant molecules except R-23, R-32 and R-152a are included in the PFAS definition as well as many fluoropolymers used as seals, bearings, electrical windings, and electrical sensors, to name a few. The main characteristics which could lead to restrictions are if the molecules are persistent in the environment (P), bio-accumulative (B) or toxic (T). None of the refrigerant molecules meet these criteria and reports published by the United Nations Environment Programme have stated that any breakdown products should not be considered for legislative purposes and have very minimal impact on the environment. Just as with the F-Gas regulation, the REACH legislation (which regulates chemicals including PFAS) in the EU and GB are completely independent and there is already a clear difference between the two processes.

In the EU, a proposal was drafted, and the European Chemicals Agency (ECHA) will decide if it is proportionate to the risks presented for each substance covered. This process is ongoing including stakeholder consultation which produced more than 5,600 comments from more than 4,400 contributors, and no decision is expected until 2024/25. In a worst-case scenario, the EU proposal would still allow use of F-Gases in existing equipment for 15 years after implementation but there could also be limitless derogations.

In GB the Health and Safety Executive, working with the Environment Agency, have published a report which explains the GB approach which will group chemicals by the risk posed. The report recognised that compounds used in the RACHP industry are not persistent in the environment, not bio-accumulative nor toxic and therefore posed a low risk and may receive a derogation. It is very likely in GB that F-Gas will be the dominant regulation.

## Refrigerant replacement solutions

Application		Current Refrigerant	New equipment	
			Low GWP (<750) <small>Interim Solution</small>	Very Low GWP (<150) <small>Long Term Solution</small>
	Packaged Chiller	R-134a (1430, A1)	R-513A (631, A1) R-515B (293, A1)	R-1234ze (7, A2L) R-1234yf (4, A2L)
	Packaged Chiller Single split or VRF	R-410A (2088, A1)	R-32 (675, A2L) R-452B (698, A2L) R-454B (466, A2L)	R-1234ze (7, A2L) R-471A (148, A1)
	Monobloc (outdoors)	R-410A (2088, A1)	R-32 (675, A2L) R-454B (466, A2L)	Propane* (R-290) (3, A3) R-1234yf (4, A2L) R-454C (148, A2L) R-455A (148, A2L)
	Split systems	R-410A (2088, A1)	R-32 (675, A2L) R-454B (466, A2L)	R-1234yf (4, A2L) R-454C (148, A2L) R-455A (148, A2L)
	Multi-compressor >40kW	R-448A (1387, A1) R-449A (1397, A1)	R-454A (239, A2L)	CO <sub>2</sub> (R-744) (1, A1) R-471A (148, A1) R-454C (148, A2L) R-455A (148, A2L)
	Single compressor or <40kW	R-448A (1387, A1) R-449A (1397, A1)	R-454A (239, A2L)	R-471A (148, A1) MT Only R-454C (148, A2L) R-455A (148, A2L)
	MT Condensing Unit	R-134a (1430, A1)	R-513A (631, A1) R-515B (293, A1)	R-1234ze (7, A2L) R-1234yf (4, A2L) R-471A (148, A1)
	Commercial Refrigeration (Non-retail)	R-448A (1387, A1) R-449A (1397, A1)	R-454A (239, A2L)	R-454C (148, A2L) R-455A (148, A2L)
	LT Condensing Unit	R-448A (1387, A1) R-449A (1397, A1) R-452A (2140, A1)	R-454A (239, A2L)	R-454C (148, A2L) R-455A (148, A2L)
	Blast Chiller	R-448A (1387, A1) R-449A (1397, A1)	R-454A (239, A2L)	R-454C (148, A2L) R-455A (148, A2L)
	Blast Freezer	R-448A (1387, A1) R-449A (1397, A1) R-452A (2140, A1)	R-454A (239, A2L)	R-454C (148, A2L) R-455A (148, A2L)

### In summary

Whilst the detail of the GB regulation is still unknown, there is enough information available to make sensible decisions. We know with certainty that the TCO<sub>2</sub>e phasedown will accelerate and that no-one can avoid moving to low or very low GWP options. Stalling a decision will just increase the pressure on the amount of F-Gas quota available and will likely increase the financial burden on end users. In the EU legislation, any GWP limited bans on maintaining equipment over the next 25 years do not cover refrigerants with a GWP <750, so installing systems today using refrigerants with a GWP <750 is a valid strategy but continuing to install new systems using refrigerants with a GWP>750 may open up users to a situation where the expected equipment life is longer than the refrigerant availability.

One final consideration: energy efficiency. In many cases there is currently no legislation for this but there are many good reasons for ensuring the options chosen have good energy efficiency. Financially and environmentally, using the most energy efficient options makes sense and remember, the lowest GWP does not always mean the best energy efficiency and lowest total emissions. 🏡

\*Credit: F-Gas Regulation in Great Britain Assessment Report, December 2022, Department of Environmental Food & Rural Affairs

# Many roads lead to Net Zero

John Phipps, Commercial Director UK at A-Gas, examines the impact of cost when it comes to refrigerant choice.



John Phipps

A-Gas has pledged to become a net-zero company by 2035 with the Towards Zero, Together mantra. The climate and refrigeration industry is on the same path, guided by the key drivers of quota, cost and ESG (Environmental, Social & Governance).

Quota is directly linked to governmental policy, which will potentially lead to a full phase-out of F-gases with a GWP of more than 150 by 2032. ESG is a mix of public perception and investment.

Both of these are topics for future articles, while this article will focus on the cost driver and the inputs into that.

To begin the discussion we can split the costs into CAPEX and OPEX. As an employee of A-Gas, a supplier of gas, the focus is the OPEX area. The argument could be made that for a newly installed system the first charge is actually CAPEX and only subsequent top-ups are OPEX.

## OPEX Discussion

Notwithstanding the comments above, if we begin with OPEX from a gas perspective then what are the main cost drivers on the Net Zero journey?

Clearly, the higher GWP refrigerants are becoming more scarce, and quota is restricting virgin import volumes, which leads to the simple economic supply

and demand pricing to reach a market equilibrium price. This pressure affects the > 150 GWP synthetics but does not affect the new generation of A2L refrigerants, the natural A3 hydrocarbon-based or natural refrigerants such as ammonia or CO<sub>2</sub>. The OPEX costs for higher GWP gases will rise over time due to simple market economics.

Based on the current low availability of sub-150 GWP refrigerants, the production costs and their patents will keep the market price mostly matching the higher GWP synthetics. Heat pumps are moving toward propane (R290), but we are focusing on chilling, not heating, so what about the OPEX of CO<sub>2</sub> (R744) or ammonia (R717)?

For this edition I will focus on CO<sub>2</sub>. Cost per kg, it is significantly less than R407F, R404A or R410A, and it is a great potential alternative due to its zero ozone depletion potential (ODP) and a global warming potential (GWP) of 1, compared with several thousand for some synthetics. But what about the performance (we are ignoring the CAPEX portion as this certainly isn't a drop-in solution)?

A CO<sub>2</sub> refrigeration system suffers performance degradation in warm or hot climatic regions as it operates in its supercritical region. (Bruno, F.; Belusko, M.; Halawa, E, 2018) conducted a

comprehensive review of CO<sub>2</sub> refrigeration systems with the transcritical operation considered a significant factor.

The study noted that using CO<sub>2</sub> is a challenge due to the system operating in a supercritical state. This means heat rejection capacity is degraded, reducing the coefficient of performance (COP) of cooling.

This review concludes that although the system analysis shows that the expansion process during transcritical operation is the process that contributes to the largest exergy destruction in the CO<sub>2</sub> cycle - This is mainly due to the high pressure of gas exiting the gas cooler that must be expanded to enable the cooling effect in the evaporator. Energy performance is comparable to systems using other refrigerants, and, as we know, for supermarket refrigeration, the OPEX cost of gas is a big factor.

Research by (Yang, D., Li, Y., Xie, J., Wang, J 2022) noted that for supermarket refrigeration, the application of transcritical CO<sub>2</sub> technology is the most mature, but energy consumption is a concern.

As can be seen from Table 1, below left, observing the total equivalent warming impact (TEWI), a comparison is made between synthetic refrigerants, CO<sub>2</sub> and NH<sub>3</sub>.

This work by Karampour, M., Sawalha, S. (2018) looked at supermarket operation in Stockholm and Barcelona. Figure 1, facing page, clearly shows the high ambient significantly raises the electricity consumption but makes little difference to the leakage. However, note that they are not using sub-150 GWP R471, but rather R404A and R449A (many thousand GWP). The work therefore concludes that a state-of-the-art integrated CO<sub>2</sub> system can meet the entire thermal demands of supermarkets efficiently in cold and warm climates.

Research by (Sánchez, D., et al 2018) focused on comparing a DX system of CO<sub>2</sub> vs R134A operating at three heat rejection

Table 1 TEWI analysis assumptions

Parameter	Assumed value	Notes
Leakage rate [%]	10% DX loops 5% indirect loops	$M_{leakage}$ divided by $M_{ref}$ [%]
N [years]	15 years	
Refrigerant charge [kg / kW]	CO <sub>2</sub> : MT=3, LT=3 Cascade: high stage = 0.75 (compact units) Cascade: low stage = 4 HFC/HFO DX: MT = 2, LT = 4 HFC/HFO indirect: MT = 1, LT = 3	Charge of refrigerant per design capacity of refrigeration unit Values are partly adopted from (Emerson Climate Technologies, 2010)
Design refrigeration capacity [kW]	200 kW for MT, 250 kW for cascade high stage evaporators, 35 kW for LT	Design temperature 35°C T <sub>amb</sub>
κ	0.95	
GWP <sub>ref</sub>	CO <sub>2</sub> = 1, NH <sub>3</sub> (R717) = 0, Propane (R290) = 3, R404A = 3922, R449A = 1397	(BITZER, 2016)
RC [kgCO <sub>2</sub> / kWha]	Sweden = 0.079 Spain = 0.639	(Bertoldi et al., 2010)

Source: Karampour, M., Sawalha, S. (2018)

temperatures using a cabinet for fresh product as the cooling load. The results can be seen in Figure 2

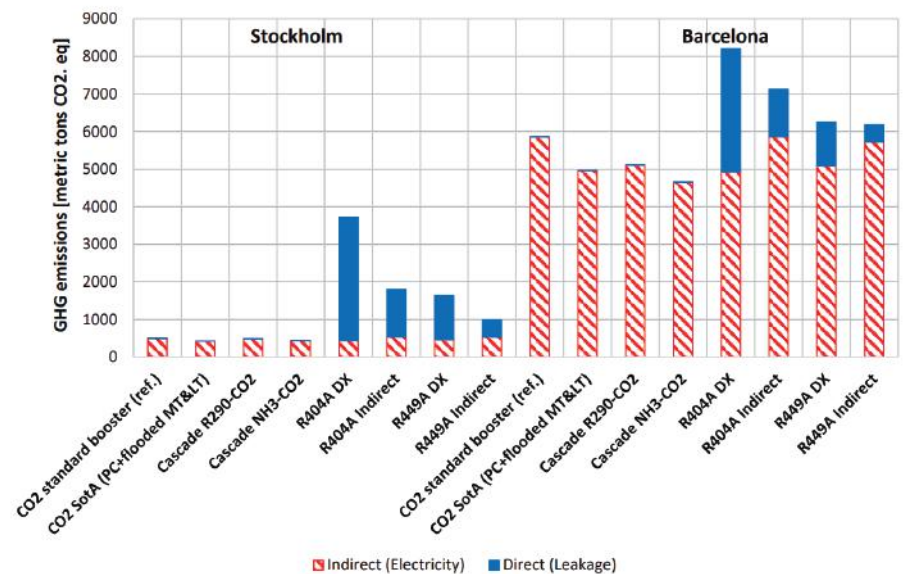
(Sánchez.D , et al 2018) concluded that for two DX systems running R134a and CO<sub>2</sub> servicing a medium temperature cabinet with the same operating conditions at three different heat rejection temperatures (23.3, 32.7 and 43.7 °C) and water as the secondary fluid, CO<sub>2</sub> does not provide the same efficiency as the R134a-system. The difference can be clearly seen in Figure 2, below.. Adding a second internal heat exchanger, as illustrated, does reduce the difference significantly

**Conclusion – is synthetic or natural best?**

At the beginning of this article I mentioned simple economic supply and demand equilibrium. Economists use a phrase when drawing their curves ‘Ceteris Paribus’ which is Latin for with other conditions remaining the same or other things being equal.

That is where the OPEX discussion above needs reviewing from a different angle. It’s true that CO<sub>2</sub> can, in some cases, match the energy consumption of synthetics, and it is without doubt cheaper, but that is today.

**Figure 1 TEWI comparison of supermarket systems in Stockholm and Barcelona**



Source: Karampour, M., Sawalha, S. (2018)

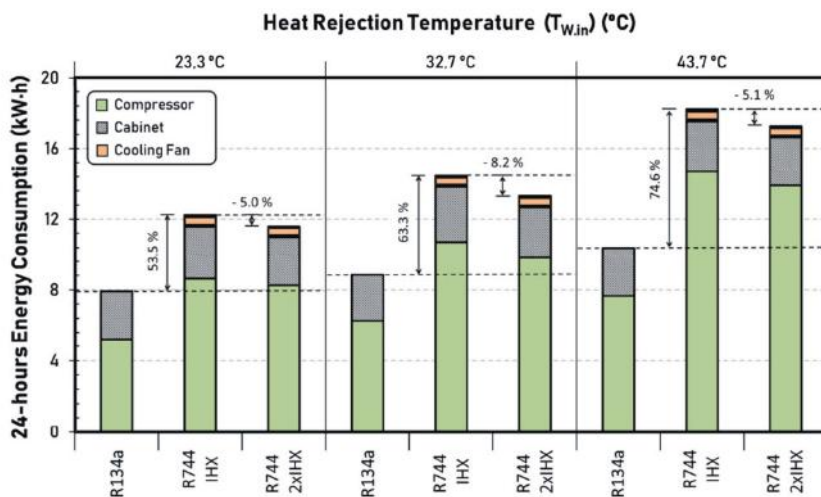
We know that to encourage carbon/CO<sub>2</sub> abatement then the price for capturing CO<sub>2</sub> must rise and with Carbon Capture and Storage (CCS) there is just cost, but for Carbon

Capture Utilisation and Storage (CCUS) there is usage. So once many systems have changed to CO<sub>2</sub>, and demand is outstripping supply, which it already sometimes does in the summer months for AC and refrigeration, then with that comes price increases. The next factor to consider is just like the promise of lower bills after insulating your house and fitting a heat pump, you could wait 25 years to see payback.

Therefore as a supplier who is agnostic about the gas but wants to help industry down the path to net zero, new installations of CO<sub>2</sub> make sense, but retrofitting before the end of life both in terms of CAPEX costs and CO<sub>2</sub> wasted in scrapping equipment in the warmer regions of the UK seem less viable. The truth is rather like energy generation; we need a mix of solutions using both natural and synthetics where the greatest efficiency and lowest CO<sub>2e</sub> is emitted.

- The next A-Gas article will focus on ammonia.

**Figure 2 – 24 hours total energy consumption of the refrigerating system.**



Source: Sánchez.D , et al 2018

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# A breath of fresh air

Indoor Air Quality (IAQ) is increasingly under the spotlight for developers across the residential sector due to the growing awareness of mycotoxins and how they adversely affect the respiratory system. With high profile cases of moulds linked to numerous health issues in the media, developers are now under renewed pressure to guarantee that their approach is holistic and meets updated building regulations that have been designed to protect occupants of new residential developments. Here, Tony Croke, Product Manager for Indoor Climate Solutions at Wavin, explains how Mechanical Ventilation with Heat Recovery (MVHR) systems can play a key role in enhancing the experiences of residents whilst also lowering energy consumption and associated costs.



Designers, developers, manufacturers, and regulators across the built environment are taking a broader view of their residential projects and are examining their societal, as well as environmental, impacts – including the health and wellbeing of occupants. Taking steps to promote enhanced IAQ is a crucial element of this and, in recent years, housing developers have come under increased pressure from central government to guarantee adequate and safe air quality indoors.

In turn, this has seen a rise in demand for ventilation technology that enhances IAQ, such as MVHR systems which provide powerful airflows without any compromises to energy or cost efficiency.

## Prioritising health

People in the UK spend between 80-90% of their time indoors, with this figure expectedly even higher for those vulnerable or physically immobile, and housing developers now have a personal stake in the health and wellbeing of the future occupants of developments.

There are several airborne pollutants that are common within urban indoor environments like dust, pollen, and damp, as well as chemicals from everyday cleaning products. A failure to address these pollutants can have acute health impacts for residents with symptoms ranging from headaches to respiratory problems, collectively known as ‘sick building syndrome’.

However, simply allowing for people to open a window to improve ventilation doesn't solve the problem, as this air can contain equally harmful pollutants. External air pollution in UK urban areas is often notably high, with Greater London alone having reported the equivalent of between 3,600 and 4,100 deaths which were attributable to human-made pollutants in 2019.

MVHR systems, such as Wavin's Ventiza range, were created to take some of the pressure off traditional heating systems, passing air over a heat exchanger to bring it to an ambient temperature before it enters a home. Crucially, the systems also filter air for dust, pollen, and pollutants, meaning there is minimal negative ingress from outside.

The impact of pollution from human activity also can't be ignored. A good example of this is if people choose to dry clothes indoors, on or close to radiators, during the winter months. This can lead to high levels of humidity indoors. A system such as Ventiza can remove between 2 and 9 litres of moisture from the air each day.

Different pollutants have specific effects for different people, and MVHR systems allow users to adjust filters to limit their contact with the allergens and particles which are most damaging to their health. This feature also allows users to account for seasonal and regional variation – hay fever sufferers can protect themselves in the summer months and people can

minimise the impact of specific sources of pollution in their local area.

## Optimising warmth

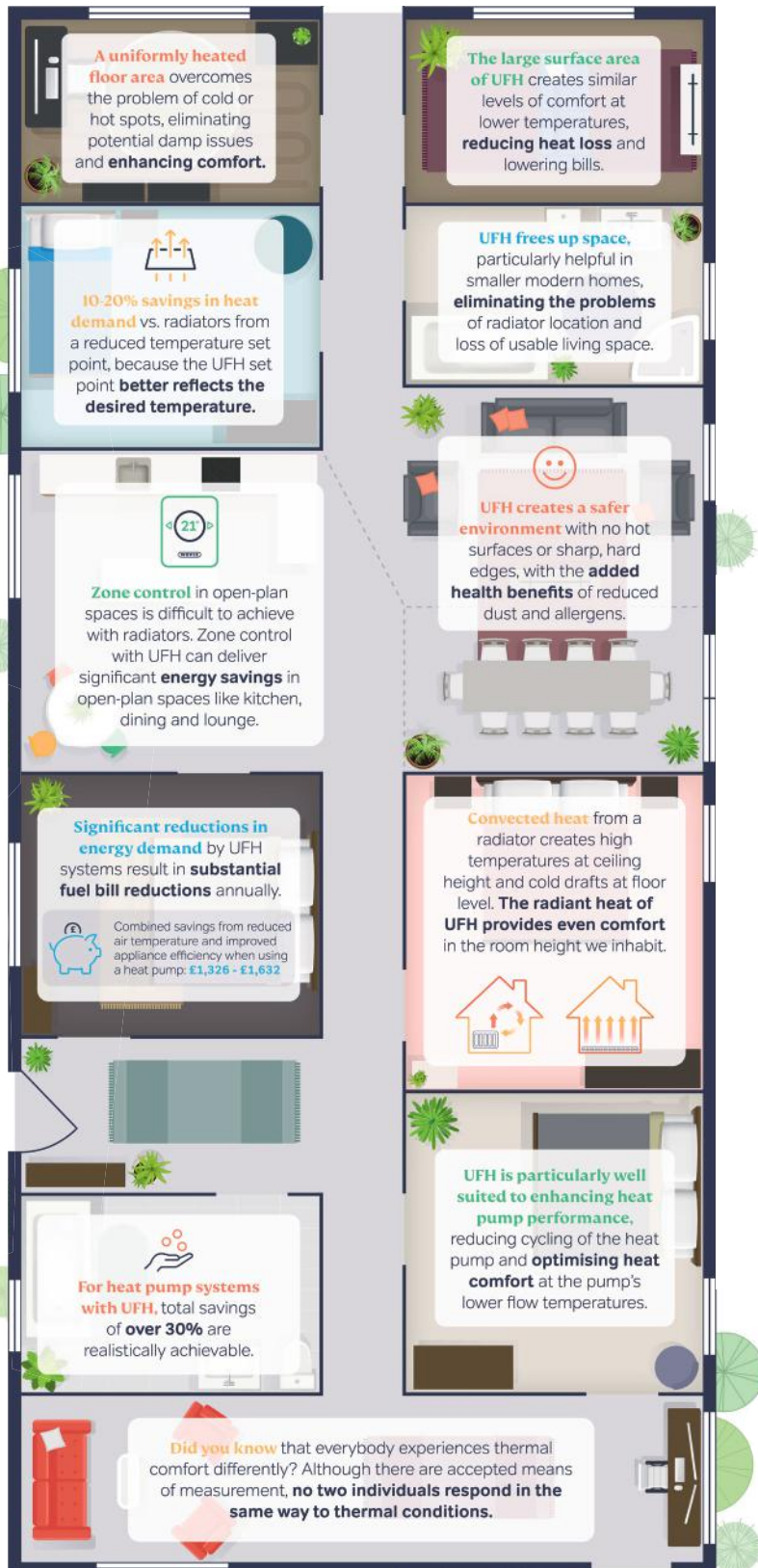
Another consequence of introducing air from outside using more traditional ventilation methods is allowing cold air in during the cooler months, putting pressure on heating systems and consequently driving up energy consumption. MVHR systems pass air over a heat exchanger, providing a consistent supply of warm, fresh air working in tandem rather than against existing systems.

These solutions help overcome a fundamental problem that developers face when specifying ventilation systems in residential properties – how to balance the increased airflow provided by ventilation with airtightness and energy efficiency. Users can also run their heating systems using smart controls, so they have sight of energy efficiency while also staying warm.

Many MVHR systems are also flexible, meaning housing developers and local authorities can choose the system that best suits the size of the home they're fitting. The Ventiza range comes in four different sizes, meaning residents aren't left with a too-large system that adds unnecessarily to heating bills or, conversely, one that isn't up to the task. This diversity in size also comes in handy in urban environments, making MVHR a practical choice when space is often at a premium.



The advantages of underfloor heating (UFH) over radiators



Key highlights from an authoritative research white paper into the performance, benefits and applications of underfloor heating, relevant to the decarbonisation of residential heating in new build projects.

Keeping costs low

As the cost of living crisis appears to be easing, the notably high utility bills of previous years are still understandably a concern for many who will be seeking cheap ways to fuel and heat their homes.

MVHR systems are an ideal solution to guarantee lower costs for homeowners due to their extremely lower power consumption, and their recycling of warm air inside. When twinned with effective insulation within a property, the financial benefits of an effective ventilation system are clearly evident to property owners and users.

New developments play a huge role in the provision of affordable, accessible housing to communities and residents should feel comfortable that the air in their home won't have an adverse impact on their health. Mechanical ventilation with heat recovery systems are key in ensuring that designers and developers don't have to choose between air quality and affordable solutions for occupants. Heating and ventilation systems that work together can help lessen the impact of rising energy bills, and ensure homes are fit for the intensive long-term use which is demanded of them.

For more information about Wavin's indoor climate solutions offering, including its MVHR ranges, visit: <https://www.wavin.com/en-en>.

- 1 <https://post.parliament.uk/research-briefings/post-pb-0054/>
- 2 <https://www.gov.uk/government/publications/air-pollution-applying-all-our-health/air-pollution-applying-all-our-health>
- 3 <https://www.nhs.uk/conditions/sick-building-syndrome/>
- 4 <https://erg.ic.ac.uk/research/home/projects/tfl-hia-maqp.html>
- 5 <https://www.wavin.com/en-gb/products/e3d493e4-8abf-4027-a986-b9732f58f366>



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# Operational carbon in new and existing buildings

Graham Temple, Marketing Manager at Mitsubishi Electric, explains the importance of reducing the carbon impact of building performance.

The UK has set a target to reach Net Zero carbon emissions by 2050 and in some ways we are well on the way towards achieving this objective; in others, the country still has some way to go. The Climate Change Committee (CCC) reported in June that UK emissions have been falling steadily over the last three decades, and we are 'likely' to have met our most recent carbon budget, which ran from 2018 to 2022.

However, the CCC also warned that the UK cannot rely on past success to carry it into a low-carbon future, and carbon reduction targets for all sectors will become more challenging in the next carbon budget.

With that, there must be a focus on reducing the carbon impact of building performance in particular. As part of this, one of the big areas of focus for buildings must be reducing the operational carbon (the carbon produced during a building's

use phase). Some of these emissions may be direct - such as burning fossil fuels such as gas or oil on-site for heating and hot water - while others might be indirect operational emissions, created when electricity used in the building is generated from fossil fuels.

The UK Green Building Council states that 19% of the UK's carbon footprint is from operational emissions produced from energy used to heat, cool and power buildings - so understanding the drivers and strategies to reduce it is crucial.

## The drivers of operational carbon reduction

There are a variety of standards and pieces of legislation being put in place to keep building emissions - including operational carbon emissions - down.

For example, Energy Performance Certificates (EPCs) are central to several government policies around building



Graham Temple

performance, particularly energy efficiency. The prime example is Minimum Energy Efficiency Standards (MEES), which the government is using to drive higher energy efficiency in new and existing buildings. If a commercial building does not achieve an EPC rating of B by 2030, it cannot be leased or sold, impacting its asset value.

Given that the current minimum is E, many commercial buildings face the challenge of significant upgrades to meet the new standard. In fact, the property industry estimated that in 2021, 60% of existing stock would not achieve a B rating and that landlords would have to invest in efficiency refurbishment at double the usual rate over the next seven years.

There is also work being done to develop specific definitions and targets for 'Net-Zero' buildings, and some businesses in the construction, property and installation sectors are adopting voluntary standards and more accurate measures of building energy use. They are also examining the buildings they own or



occupy in terms of corporate sustainability and ESG strategies, and are finding ways to estimate operating costs as well as carbon emissions.

All of this means that there must be a greater focus on measuring and then reducing operational carbon to help keep overall emissions down, and ensure increasingly stringent standards are being met – and that buildings don’t become ‘stranded assets’ in the near future.

**Strategies to cut operational carbon emissions**

The UK Green Building Council defines a Net Zero operational energy building as: “When the amount of carbon emissions associated with the building’s operational energy on an annual basis is zero or negative.”

Building owners looking to achieve this must start with looking at their HVAC systems, as they are significant energy users. Whether a building owner is targeting a higher EPC rating or simply wants to improve the energy performance of their building, a systems approach is key to success.

Four areas to focus on include:

**1. Decarbonise heating and hot water**

Targeting operational Net-Zero means removing the use of fossil fuels on-site. Buildings are increasingly moving away from the use of any natural gas or oil for heating and hot water and switching to an ‘all electric’ approach. Heat pumps are one of the most widely used alternatives to the gas or oil boiler, and they provide energy efficient electric heating, as well as meeting domestic hot water requirements. Modern commercial heat pumps can now deliver water temperatures up to 90oC, so can be applied in buildings with significant hot water demands, for example, from showers and gyms.

**2. Make use of ‘waste’ heat energy**

Modern HVAC equipment is energy efficient, but performance can be optimised further. One way to do this is through heat recovery, where ‘waste’ heat is used as an energy source, taking heat energy ejected from one part of a building and applying it in another.

For example, this strategy can be used through mechanical ventilation with heat recovery (MVHR). Heat energy from air expelled by the ventilation system is

transferred to incoming outdoor air before it enters the occupied space. This reduces the amount of heating required for incoming air, saving energy.

On a larger scale, the heat recovery principle is also used in ambient heat loops. These can be particularly useful for mixed-use developments where heat extracted from office or retail cooling systems is transferred to on-site residences such as apartments using heat pump technology.

**3. Use controls to monitor and manage energy use**

Building controls are critical in helping building managers monitor and manage energy use – especially given the growing requirement for data collection on building performance. In addition, the ability to spot trends gives facilities and energy management teams the insights to take action where energy is potentially wasted.

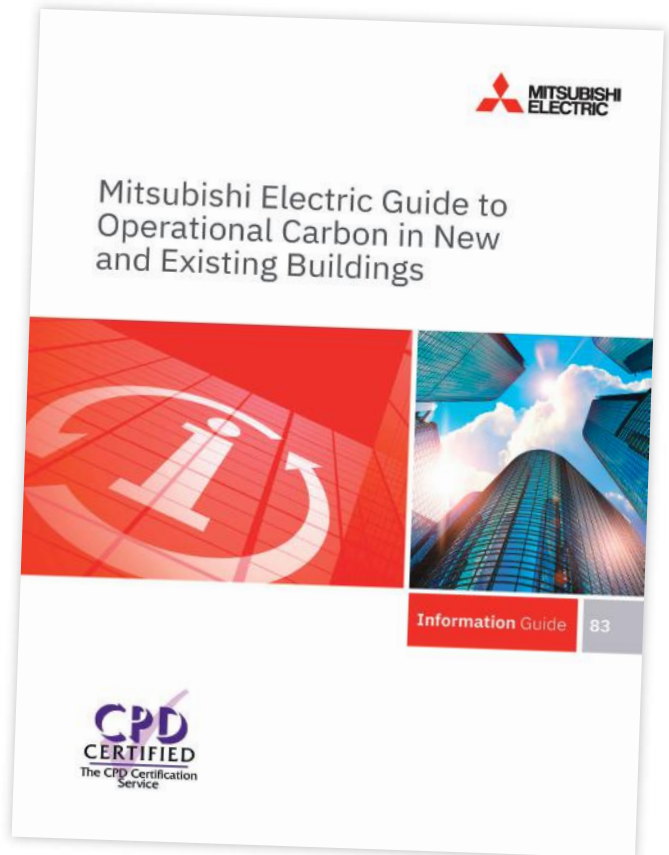
**4. Specify HVAC equipment to achieve carbon objectives**

One of the most challenging aspects of the focus on the carbon impact of buildings is how it may affect the specification process. For example, highly energy efficient equipment may have a higher embodied carbon footprint than an alternative which uses more energy in the long term, affecting the building’s operational carbon.

Some important questions for specifiers include, at what point does the equipment’s operational efficiency outweigh higher embodied carbon? Or how long does a high-efficiency product with high embodied carbon have to operate before its whole life carbon balances against a lower-efficiency product with lower embodied carbon?

**Closing thoughts**

As building designers, owners and managers look to create low carbon



buildings for the future, operational carbon is a key area to consider. The UK is facing rising temperatures and more stringent carbon emission legislation, and therefore it will be vital to consider of how our existing building stock, constructed for a cooler climate, will manage higher temperatures in the next decade.

Fundamentally, we can combat these challenges by taking control of operational carbon. Considering the HVAC equipment used in buildings, as well as being able to closely monitor energy use and even make use of ‘waste’ heat will help the UK to meet carbon targets while tackling a changing climate. The work should start now because there are so many factors to consider, and buildings that adapt and become more sustainable will be the ones that retain their value in the years to come. 🏡

Mitsubishi Electric has released a CPD guide on this topic, available to download at: <https://bit.ly/3stzTZz>

## Carrier's Apprenticeship Scheme Helps Bridge Skills Gap in HVAC

Carrier reaffirms its commitment to training and investing in the next generation of HVAC engineers and technicians with a new apprenticeship campaign.

New investments include the appointment of an apprenticeship manager and the creation of the Bracknell Training Centre of Excellence.

Many of Carrier's longest-serving managers, engineers and product experts began their careers as apprentices in a program that has continued to evolve over the last 30 years with advances in HVAC technology. At a pivotal point for decarbonisation plans to reach net zero, Carrier is encouraging young people to join Carrier with 20 apprentice positions located in the UK.

Buildings account for 39% of global energy-related carbon emissions, of which 28% comes from operational emissions needed to heat, cool and power them. For these reasons, Carrier's apprenticeship scheme encompasses the design, application, installation and digitally

connected servicing of equipment to maintain facilities with advanced data analytics and advisory services. Apprentices can benefit from the mentorship of Carrier's highly trained and experienced engineers, graduating with the essential knowledge and skills for electrification of heating and air conditioning.

### Range of qualifications

Apprentices have the opportunity to study a range of qualifications, including refrigeration and air conditioning and building services engineering. These qualifications are required to work with Carrier's new equipment, service and rentals groups. Each apprenticeship pathway provides a comprehensive blend of practical and theoretical learning. Every graduate has excellent

progression opportunities either into higher levels of study or into a rewarding career within Carrier.

"I loved my apprenticeship," said Joseph Vipond, who recently completed his HNC Construction (Building Services Heating Ventilation and Air Conditioning) qualification and seamlessly transitioned into Carrier's pre-sales team. "It gave me the perfect opportunity to gain a Level 4 qualification and earn a competitive wage while doing it. Work fit nicely around my college timetable, and it was great to apply things I learned in class to a real situation. I am thriving in my new full-time role with valuable skills for life."

To find out more about Carrier's apprenticeship campaign and to apply, please visit [www.carrier.com/commercial/en/uk/](http://www.carrier.com/commercial/en/uk/)

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**JEN VICKERS, VICE-PRESIDENT, BCIA**

*Jen Vickers* of Crown House Technologies has been elected as the next Vice-President of the Building Controls Industry Association (BCIA). She joined the BCIA Management Committee in January 2023 and takes up her position as Vice-President in March.



Vickers has worked for Crown House Technologies, which is part of Laing O'Rourke, since 2015. More recently she has started to project manage the BEMS package on a number of projects. In April 2022, on behalf of the BCIA, she took responsibility for launching the BCIA Young Engineers Network (YEN) and delivered a programme of three YEN events before supporting the YEN to establish a more formal working group structure.

The BCIA will also welcome three new members to the Management Committee:

**Simon Ward** has worked in the building controls industry for more than 30 years with both manufacturers and system integrators and has developed a wealth of knowledge regarding markets, products, solutions and customer base.

**Lewis Locke** is a Regional Director with BGES Group and has previously served as a Marine Engineering Mechanic with the Royal Navy. He is keen to open more pathways for veterans into the building controls industry.

**Clare Grams** joins with over two decades of facilities management and controls experience and aspires to serve as a role model and advocate for empowering more women to pursue careers in the building controls sector.

<https://bcia.co.uk/>

**PAUL STEVENS, TECHNICAL SALES TRAINER AND SUPPORT ENGINEER, UNICO**

*Paul Stevens* has joined Unico as Technical Sales Trainer and Support Engineer to further strengthen the company's installation capability across the UK.



He previously spent a number of years within the new build domestic and modular housing sector as an electrical supervisor, and has extensive knowledge of supporting and training colleagues.

The Unico System is a 3-in-one heating, ventilation and cooling solution and the company says this appointment will ensure that delivery of training to installers is consistent and that ongoing support to new and existing installers is provided.

Stevens said: "I have enjoyed my time at Unico so far and I am looking forward to seeing how my role develops over the next 12 months and beyond. Having spent some time in America with Unico Inc to develop my technical skills in the system, I look forward to going back to spend more time with the team."

Founded in the United States, Unico is an international family-owned company. It now has sales operations in North America, Europe including the UK, Africa, Central and South America, India, and China. The company has over 25 years of experience in Small Duct High Velocity (SDHV) heating and cooling systems.

[www.unicosystem.co.uk](http://www.unicosystem.co.uk)

**SIMON LUNT, HEAD OF BUSINESS DEVELOPMENT, BESA**

The Building Engineering Services Association (BESA) has appointed *Simon Lunt* as its first head of business development as part of a wider strategic review.



Lunt began his career in the chemical industry in Scandinavia with Forchem Oy before moving into the health & safety sector covering the UK construction, manufacturing and facilities management (FM) sectors at Arco.

He spent three years running his own sales training consultancy during which time he supported firms in the FM and air filtration industries. He has also worked in the specialised hostile environment gas detection business as sales and marketing director for Analox, which supplied projects for the International Space Station, NATO submarines and the deep-sea diving industry.

Lunt said: "My role is to help the membership team add as much value to as many companies in the building engineering sector as possible," he said. "BESA offers a remarkable breadth of benefits, and we want our members to take advantage of everything they can, including getting involved in our working groups and committees which can affect real change across the sector."

<https://www.thebesa.com/>

**WOLFGANG MAYER, CHIEF TECHNICAL OFFICER, ZIEHL-ABEGG**

Ventilation, control and drive technology specialist Ziehl-Abegg has appointed *Wolfgang Mayer* as its new Chief Technology Officer.



Previously CTO at Kuka Robotics, Mayer helped globalise the company's development activities, establishing and expanding R&D departments in China, Hungary, Finland and the USA. The mechanical engineer says he also has a soft spot for "smart product architecture".

With a degree in engineering, he had worked for Kuka since 1996. Initially holding various roles in application and software development, the mechanical engineer subsequently headed research and development in the field of mechatronics and became CTO in 2020.

Ziehl-Abegg employs 2,800 people in its production plants in southern Germany. The company has a global workforce of 5,100 spread between 15 production plants, 30 companies and 117 sales locations.

<https://www.ziehl-abegg.com/>

### HARRY BUDD, HEAD OF MARKETING, LOGIC4TRAINING

Training provider Logic4training has appointed **Harry Budd** as its new Head of Marketing.

Budd joined the business in October 2022, initially as Content Creator, helping to grow Logic4training's social media presence, which boasts 5k followers on Facebook and over 8k on Instagram.

Mark Krull, Director of Logic4training, said: "Harry has a great deal of energy and over the last year or so he has been dedicated to continuously improving Logic4training's presence across all digital marketing platforms including Facebook, Instagram, Tik Tok, and YouTube. He has produced a growing number of quality videos and digital content for us to use on all our social media platforms and we've found that these are working well to help us engage with our customer base. We wish Harry luck in his new job and are looking forward to seeing him develop his ideas and talents further."

Budd is now planning for the launch of Logic4training's new apprenticeship programme, which will start in the summer.

He said: "I'm excited about introducing apprenticeships at Logic4training, offering trades businesses a good way to expand and offer more to their customers. It feels good to be developing training opportunities for a wider range of people and to help in addressing the skills shortage. It'll be an exciting year!" Logic4training has employed a new Content Creator, **Kabir Baraky**, allowing Budd to focus on leading on the overall marketing strategy, on and offline.



Harry Budd



Kabir Baraky

### NIKOLAY KOLEV, MOBILE SERVICE ENGINEER, CLIVET

**Nikolay Kolev** has joined Clivet as a Mobile Service Engineer, bringing with him more than 20 years of experience as a technical specialist in the HVAC industry.

He said: "As an electrical, mechanical and processes fault finder, my attention is always focused on the installation mistakes, how to avoid them and the steps towards their improvement."

"I am happy to be part of the Clivet team and look forward to my experience and knowledge supporting the installation and improvement of Clivet products."

[www.clivetgroup.co.uk](http://www.clivetgroup.co.uk)



### TOMAS FIGURA, DONNA HART, TG LYNES



Tomas Figura



Donna Hart

**Tomas Figura** has continued his progression through the ranks at heating, plumbing and air movement materials supplier TG Lynes after being promoted to Estimation & Technical Sales Executive.

Figura has been with the business for 12 years, starting out in the warehouse before moving onto the trade counter and later into the office as Sales Executive.

He has been rewarded for his hard work and commitment with his new role, which will see him take on additional responsibilities around tendering and estimating, as well as providing technical advice and follow-ups during the project period.

TG Lynes has an eight-strong sales team, headed by Sales Director Joe Kane, who said: "I'm really pleased for Tomas, who has worked hard to rise through the ranks and has built up strong

relationships with many of our customers. He's an important part of the sales team and I hope we can support him in taking his career as far as he wants it go in the coming years."

Elsewhere, **Donna Hart** has been promoted to Assistant Warehouse Manager. After three years with the company, she remains unfazed by being the only female in the TG Lynes warehouse. She said: "Warehouses are still predominantly male environments and I think there was some apprehension when I first started. I had nine years of warehouse experience already under my belt, though, and the team soon realised I was willing and able to do everything that the men do."

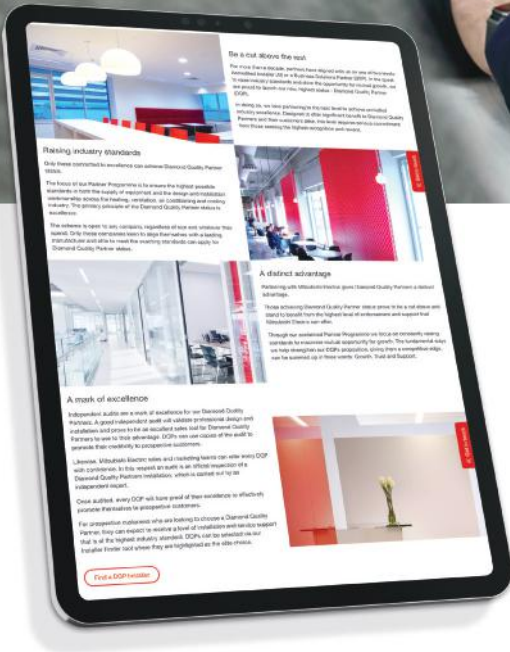
"TG Lynes is a great company to work for and they've supported me in my growth. I enjoy the work ethic, its charity work and its commitment towards environmental responsibility."

Andrew Ingram, Managing Director at TG Lynes, said: "I am delighted that we have been able to reward Donna with this promotion as she continues her journey with TG Lynes. Donna has shown fantastic leadership skills and I'm confident she will flourish in this new role."

[www.tglynes.co.uk](http://www.tglynes.co.uk)

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\* Marc Smith, Regional Sales Manager



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Email: [Partner@meuk.mee.com](mailto:Partner@meuk.mee.com)

Visit: [les.mitsubishielectric.co.uk/partner-programme](http://les.mitsubishielectric.co.uk/partner-programme)



# The Innovation Zone

The guide to what's new for ACR Journal readers, offering vital industry news.

To advertise your product in 'The Innovation Zone' section please contact [victoria.brown@warnersgroup.co.uk](mailto:victoria.brown@warnersgroup.co.uk)

## ROCKWOOL LAUNCHES CPD ON BUILDING SERVICES INSULATION STANDARD

ROCKWOOL, the UK's leading stone wool insulation manufacturer, has launched an 'Introduction to BS 5422', a new CPD (Continuing Professional Development) module to support specifiers and engineers with advice on how to plan and implement the insulation of building services systems following a recent update to the standard. The CPD coincides with the recent publication of ROCKWOOL's Guide to BS 5422:2023.

BS 5422 provides a method for specifying thermal insulating materials needed on pipes, tanks, vessels, ductwork and equipment for certain



defined applications and conditions within the temperature range – 40°C to +700°C in domestic, non-domestic and commercial buildings.

The standard works as guidance for consultants, engineers, contractors and manufacturers of thermal insulation in the building services sector. It supports Approved Document L as the reference point to determine the minimum thickness of insulation required to limit heat losses and gains from building services.

ROCKWOOL's new CPD module explores the factors that need to be considered when deciding on the insulation of building services systems according to BS 5422. It also demonstrates how the standard aims to improve the living and working environment of the building as well as make it safer and more energy efficient.

"With BS5422:2023, the insulation requirements for building services and HVAC systems have been aligned closely with current thermal Building Regulations," comments Will Wigfield, Product Manager - Fire Protection & HVAC at ROCKWOOL UK. "The new CPD will explain how the standard makes it easier for designers and specifiers to choose the most appropriate material for each project and allow them to exceed the minimum requirements if they wish."

**Learn more about BS 5422, register to attend the ROCKWOOL CPD session at <https://www.rockwool.com/uk/advice-and-inspiration/learning/>.**

## CONDAIR PODCAST: HOW TO CONTROL STATIC BY CONTROLLING HUMIDITY

Condair has released a new podcast about how manufacturers and commercial businesses can avoid static issues impacting their productivity by proactively managing their indoor humidity.

In this short interview with Business Net Explorer, Dave Marshall-George, Sales Director at Condair, explains why static build-up occurs at low humidity, the issues it can cause in industrial and commercial situations, and how best to control it through humidification of the indoor environment.

He said: "Electrostatic build-up is much more prevalent as indoor relative humidity drops. This means it can be seasonal issue for manufacturers. Indoor humidity is lowest in the winter, so manufacturers can experience increased problems of materials sticking together, being repelled by each other, or even sparks resulting from electrostatic discharge, during the colder months. A very effective way of dealing with this is to raise the indoor humidity to around 45%RH.

"Studies have shown that at higher levels of indoor humidity, the static charge caused by activities, such as walking across synthetic carpets, can be reduced by as much as 95-98%. This short podcast explains why and how manufacturers and facility managers can use humidity control as an effective anti-static measure."

The podcast is available via all major podcast channels, including Soundcloud, Spotify and Google Podcast by searching for "Condair" and also on the Condair website at:

[www.condair.co.uk/podcast](http://www.condair.co.uk/podcast)



## AQUITRON OFFERS 'NEXT GENERATION' SENSOR TECHNOLOGY

Aquilar says its new AquiTron AT-SRG air conditioning and heat pump refrigerant leak detection system offers the next generation in sensor technology.

The company believes that leak detection sensors should not be regarded as consumable parts and the AquiTron AT-SRG sensor, which can be retrofitted into single and double gang fixtures, claims a lifetime of 15+ years without the need for replacement or calibration.

The sensor is designed to safeguard people in occupied spaces within residential and commercial buildings such as hotels, apartments, hospital rooms and offices. It is said to be suitable for single to large multi-zone installations.

Key features:

- 15+ year sensor lifetime
- No calibration required during the life of the sensor
- Compact UK single gang electrical socket size
- Simple installation, set-up and commissioning
- Easy system testing with plug-in alarm emulation module (no gas required)
- Immune to poisoning – not affected by hairspray, deodorants or other non-target gases
- Multiple alarm outputs, audible and visual, centralised and BMS monitoring
- Automatic temperature and humidity compensation
- Mains and low voltage power options
- Easy sensor replacement (plug & play) with interchangeable sensor heads for different gas types (R410A, R32, R290 and more to follow)
- Contributes towards BS EN 378: 2016 Refrigerant Safety Compliance

[www.aquilar.co.uk](http://www.aquilar.co.uk)



**PANASONIC ADDS 20HP CONDENSING UNITS ON CO<sub>2</sub>**

Panasonic Heating & Cooling Solutions has added new 20HP cold chain refrigeration condensing units to its CO<sub>2</sub> (R744) line-up.

The new units join the existing 2HP, 4HP and 10HP systems, and Panasonic says they are suited to a wide range of applications including chilled and low temperature display cases, walk-in cold stores, blast chillers, freezers and other process cooling applications.

In line with Panasonic's commitment to create a low carbon future with its green impact initiative, the launch is said to represent a significant step in the company's strategy to grow within the industrial and retail solutions segment. The objective is to develop a suite of high-performance, energy-efficient, and environmentally friendly cold chain refrigeration



solutions offering alternatives to the high GWP systems currently in operation.

The units offer a high degree of flexibility with extended pipe runs of up to 100m, a small compact footprint of 1.06m<sup>2</sup>,

reducing the need for larger plant spaces. With features such as night-time low noise operation, the units are suitable for locations close to residential areas, particularly of benefit to the convenience store market. Fully inverter driven, the systems are said to offer high energy efficiency and can operate in ambient temperatures from as low as -20°C and as high as +45°C.

The entire range can be connected to an unlimited number of evaporators or display cases and can provide operating temperatures from +5°C down to -35°C. The units operate on an extensive range of control options providing flexibility irrespective of a client's requirements in this area.

Panasonic offers access to training and refrigeration software tools via the Panasonic Pro-Club website. Installers can access free training and commissioning tools, which enables the selection of refrigeration capacity, expansion valve, pipework sizing and the ability to calculate the required refrigerant charge.

Should installers decide to become a Pro Partner, they can earn points towards benefits such as specialist tools from Testo and accredited training courses such as those provided by Business Edge and Cool Concerns.

The manufacturer says the units comply with future European regulations regarding cooling systems, offering retailers and food outlets a path to long-term savings.

[www.aircon.panasonic.eu](http://www.aircon.panasonic.eu)

**GETTING A SPORTING EDGE WITH CONDAIR**

Condair RS steam humidifiers are creating the precise humidity needed in Sporting Edge's sophisticated environmental training and research chambers.



Sporting Edge is a global leader in altitude and environmental facilities and recreates climates from around the world for sports performance training, research and rehabilitation. Clients include Premier League football clubs, universities, Olympic associations and even high-end residential homes.

Its environmental chambers accurately and consistently create conditions from -30 to +50°C, 20 to 95%RH and altitudes up to 9,000m. The company is based in the UK but carries out installations around the world, including Scandinavia, Asia, the Middle East and Africa.

A recent installation which incorporated a Condair RS humidifier was at Newcastle United FC. A training chamber was installed that allows the club to recreate any temperature and humidity condition the players will meet in UK and European competitions, allowing the players to refine their preparation for key matches. Alongside advanced training facilities, Sporting Edge also creates high-altitude environments for bedrooms. Resting and sleeping in a high-altitude conditions can provide positive effects for asthma and diabetes sufferers, as well as improved weight loss and cardio performance.

The Condair RS resistive steam humidifier used by Sporting Edge can control humidity to ±1%RH when used with RO water and ±2%RH when used with mains. Its patented scale collector system enables limescale to be routinely emptied, thus extending the intervals between service visits. A single unit can provide 5-80kg of steam per hour to a duct via a steam lance and models with fan units can provide up to 40kg of humidity directly to a room's atmosphere.

[www.condair.co.uk](http://www.condair.co.uk)

**CLIVET EXTENDS ROOFTOP RANGE**

Clivet has launched a new range of rooftop air-to-air heat pumps with inverter technology and R32 refrigerant, aimed at busy applications such as cinemas, restaurants and auditoriums.



After introducing full inverter technology up to 160kW with the CSRN-iY series, Clivet has now added the CLIVETPack3i CSNX-iY rooftop units with a nominal capacity range from 40kW to 120kW, air flow rates from 4,000 to 25,000 m<sup>3</sup>/h and offering the possibility of handling up to 100% outside air.

Main features

- R32 refrigerant -> lower charge (up to -50%) / lower GWP compared to R410A (-80% environmental impact)
  - New CCK-REVO patented thermodynamic recovery
  - High seasonal efficiencies (SEER, SCOP up to + 40% vs. ErP)
  - High efficiency filtration with iFD technology
  - Smart freecooling management
  - New silent and super silent modes to ensure minimum noise impact
  - Smart freecooling management to meet the ambient load without switching on the unit's resources (compressors), directly introducing a suitable amount of outside air to meet set points
  - High renewal air flow management, up to 100%
  - Extended operating range in heating up to -15°C
  - Devices for advanced monitoring and management
  - Remote supervision ready with std Modbus port
  - Advanced system management with INTELLIAIR
  - Wide range of accessories to fit plant characteristics
- Product Manager Damiano Rossi said: "With this new project, Clivet strengthens its proposal in the rooftop market, offering a complete and extended range up to 350kW and 60,000 m<sup>3</sup>/h air flow."

[www.clivetgroup.co.uk](http://www.clivetgroup.co.uk)

# WOMEN IN THE ACR INDUSTRY

Meg Bradley is an intermediate electrical engineer (heat pump solutions) at Vital Energi, winner of the Project Engineer category at the National ACR & Heat Pump Trainee Of The Year Awards.



## What was your first job?

My first job was actually at an ice rink when I was still in high school. Even though this job was not in the industry and not what I aspired to do for a career, it started my journey into the world of work and I definitely learnt a lot from it. I wanted to be an engineer from a very young age so after I finished my GCSEs in 2020, I started an engineering apprenticeship with a refrigeration system and heat pump manufacturer called Arctic Circle. I was on a level 3 engineering technicians' course, specialising in electrical design.

I was unfortunately made redundant in February 2023 when Arctic Circle went into administration. I then joined the new heat pump solutions team at Vital Energi in March 2023 and finished my apprenticeship and was awarded my NVQ in August 2023.

## What does your current role involve?

As an intermediate electrical engineer in the heat pump solutions team at Vital Energi, I currently support the wider business with a large range of heat pump-related activities.

I have also started to get involved with some social value events; recently I visited a school and ran a few sessions on STEM, apprenticeships and heat pumps with some of my colleagues.

However, I am still very new to the company and my role is still evolving.

## What attracted you to the industry?

I joined as an apprentice in engineering and at the time I didn't really know what industry I wanted to go into but looking at the opportunities available, I was intrigued by my first company and what they did. After joining the company I got a real experience of the industry and I really enjoyed it. I learned so much about the different technologies available for heat transfer systems, the various refrigerants available for use, carbon reduction goals and much more which enticed me to continue my career in the industry.

## What excites/interests you about the industry?

I love how innovative and creative the industry is; there is constant development, with many new solutions helping to reduce carbon emissions while creating efficient heating a cooling systems.

There is such an amazing diverse range of opportunities available in the industry, and so many areas where you can specialise. From electrical and mechanical engineering, thermodynamics, acoustics, technical management, technical services and so much more!





**How would you like to see your career developing?**

I haven't been at Vital Energi for long but I already feel like a key part of the team. I hope I continue to flourish and keep expanding my skills and knowledge to become better at what I do. I am currently studying an HNC in building services to help expand my knowledge ,which I hope will impact my future positively.

I would love to have more social engagement in future and help inspire more people, especially women, to join engineering and the ACR industry. I have personally gained so much from engineering and the ACR industry that I would love to encourage more people to join.

**What is the best piece of advice you were ever given?**

I have had a lot of great advice throughout my lifetime but something that has always stuck with me is the phrase "just try your best". I have heard this from many people but mainly my lovely family, who have supported me through everything I have done and accomplished. Although sometimes a project, a task or a goal can be difficult and challenging, often the most important thing to remember is just to do your best because that is all you can do, and even if you fail at least you know you tried. This advice has helped me achieve so much in my career, including First Year Engineering Apprentice of the

Year at Herefordshire Group Training Association, to my recent success as Project Engineer at the ACR & Heat Pump Trainee of the Year Awards.

**What do you see as the challenges facing the industry?**

There is a lot of focus on how we can reduce carbon emissions using alternative sources of energy. I think one of the great challenges facing the industry currently is developing heat transfer technologies that are more efficient and that use natural refrigerants with a low global warming potential. The industry is facing significant change adopting these refrigerants with complex considerations due to their flammability, toxicity and higher working pressures.

**What would you say to other women who are considering coming into the ACR industry?**

There are so many opportunities out there for everyone, so take advantage of them; consider every opportunity available and do what is best for you. There are no limits to what you can achieve.

And remember there is always help and support available. I certainly wouldn't be where I am without the support and encouragement I have received from friends, family and colleagues.

Strive to learn, achieve and support each other "Empowered women empower women".

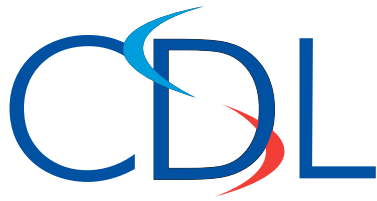


**Is there a little-known fact about yourself that would surprise other people (secret skill, unusual hobby etc)?**

I don't think there is anything particularly surprising about me, but I enjoy ice-skating in my spare time. I started when I got my job at the ice rink at 15 and have been doing it ever since. I'm completely self-taught and even know some fun tricks!

I also spend a lot of time listening to music, especially Taylor Swift who is my favourite artist. As a hardworking and successful woman, I think she is such an inspiration. Her songs have always helped and encouraged me, and I can't wait to see her on tour this year!

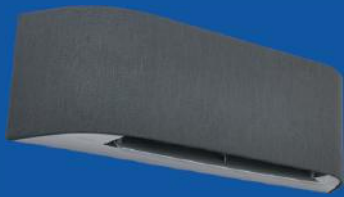
The other things I like to do in my spare time include playing rounders, drawing and spending time with my friends and family.



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