Welcome to Adveco's July newsletter,

This month, we are proud to announce that our technical director, Bill Sinclair, has been elected to chair the ICOM CHTC, and we are also pleased to introduce new enhanced controls for our award-winning FUSION electric water heating system. This month we also consider the problems of decentralising electric water heating; help tackle a retrofit challenge at a spa hotel, and respond to questions on compliance and sustainability...

Adveco's Bill Sinclair Elected Chair of ICOM Commercial Heating Technical Committee

The Industrial and Commercial Heating Equipment Association (ICOM) has announced the appointment of Adveco technical director Bill Sinclair as its new chair of the Commercial Heating Technical Committee (CHTC).

Consisting of commercial heating and hot water appliance manufacturers, the emphasis of the ICOM CHTC is on matters impacting technical advancement, including appliance production, certification and maintenance. The group works to guide UK and CEN standards and European legislation affecting products, as well as advising on and influencing political decision-making which can affect product design and characteristics.

Bill Sinclair, chair of ICOM CHTC, said, “Since 1933 ICOM has been a singular voice representing the interests of the non-domestic heating sector. Today, as the pressure of change increases, and the industry rallies behind the drive toward the decarbonisation of commercial buildings in the UK, ICOM’s role in driving technical and commercial thought and garnering Government support for better design, manufacture and implementation of heating equipment has never been more important.”

ICOM leverages the commercial and technical expertise of its membership via product-related groups and close links with other trade associations to share knowledge on industry issues of common interest. Creating this shared depth of expertise generates greater influence and impact when presenting best practice to members and for lobbying UK Government and European Committees.

Steve McConnell, director, ICOM, said, “The work of the CHTC is extremely valuable, ensuring ICOM remains effective at a very important time in the commercial heating sector. The resources ICOM produces, both technical and commercial, not only provide tangible benefits to members, but also increase engagement with decision makers in Government. One of ICOM’s key strengths.”

“ICOM has always evolved to meet and advance heating and hot water solutions for the benefit of the industry’s members, clients and, more so than ever, the wider environment”, Bill observed. “It is therefore an incredible honour to be elected to the role of ICOM CHTC chair, supporting the association at such a critical time in the evolution of the UK’s response to the need for more efficient, cost-effective and sustainable industrial and commercial heating.”

Originally the British Oil Burner Manufacturers’ Association (BOBMA), ICOM has extended its reach and membership steadily over the past 90 years so that it now covers all aspects of energy-related business activities, with targeted working groups that deliver technical advice to inform government departments.
With more than twenty years of industry experience in mechanical engineering and as technical director at award-winning hot water specialists Adveco, Bill Sinclair continues to manage the company's bespoke design and engineering team, as well as driving innovation in product and system development of water heating systems for commercial and light industrial applications.

LEARN ABOUT ICOM

Enhanced Controls For Adveco FUSION Electric Water Heating

Adveco has introduced four enhanced control panels for its award-winning low-carbon FUSION packaged electric water heater system, unifying previous controls into a single compact element.

Embracing a hybrid approach to water heating, FUSION is a pre-sized, packaged, low-carbon water heating system with a choice of 80+ pre-sized variants for small to mid-sized commercial applications. More complex projects can also leverage FUSION technology for bespoke system design.

FUSION employs a sealed primary loop approach to water heating, combining Adveco's ARDENT electric boiler with a specially designed single (ATSI) corrosion-resistant stainless steel high-pressure indirect cylinder, pipework, thermostat, and overheat thermostat. FUSION T additionally incorporates a heat pump for greater decarbonisation of water heating. Both variants also support the optional addition of a backup immersion for assured operation.

Balancing these system elements is a critical function of the design and is enabled through bespoke controls required for Eplus, T and Tplus models. FUSION's controls not only optimise the mixture of pre-heat from the heat pump, it also manages the elements within the electric boiler and backup immersions. The successful balancing of hot water demand to heat generation from multiple sources maximises the efficiency of the system, reducing energy costs, cutting carbon and improving the longevity of system elements, for fewer maintenance call outs and extended system life. The process also avoids instances of high-intensity electric heating, which, in hard water areas, could otherwise lead to deposition of limescale and costly system damage.

Adveco has released two new single-phase control panels. The first supporting FUSION T with a 9 kW electric boiler and the choice of 6 or 12 kW ASHP. The second supports equivalent FUSION Eplus and Tplus variants and is supplied with a GSM module. The three-phase control panel supports the FUSION T model, with a variant supporting FUSION Eplus and Tplus as well as bespoke FUSION-based systems. Again, supplied with a GSM module.

This variant panel can be used with any of the specified heat pumps, including Adveco's new ADVS10W model. This and FPi-32 ASHPs can be wired from the panel; larger ASHPs such as the ADVS12W can also use the controls but require a dedicated supply to the heat pump. The control panel supports both 12 and 24 kW ARDENT boilers as well as a backup immersion of up to 12 kW, which will activate should either the boiler or ASHP go into fault. The new controls also provide the option to prevent immersion activation when ASHP goes into fault to limit current.

Time control clock controls are built-in, as is thermal disinfection. When connected to the BMS, disinfection and high-temperature pasteurisation functions can also be monitored when active, and a fault relay can be instigated. The new panels support connections for the LLH pump, lighting, socket, heater bar, secondary return pump and destratification pump output. With the inclusion of the GSM module, fault notifications can be enabled from the BMS or via text.

FUSION ELECTRIC WATER HEATING

The Pitfalls Of Decentralising Electric DHW With Point-Of-Use

Point-of-use (POU) electric water heating in commercial applications was created for single outlet demands, usually far away from the plant room that would be difficult to supply in other ways. Typical examples of its application might be an outbuilding, very small buildings with low hot water demand, a tea point in a warehouse with few employees or a small washroom at the end of a long, dead-end corridor.

Increasingly, POU is being specified in buildings without a gas connection to decentralise the hot water system. But is this the right way to use the technology?

Centralised hot water systems have existed in commercial buildings for generations, where the pumped secondary returns ensure hot water is available at the tap quickly. But secondary pipework does lose energy, and this is seen as an argument for using POU, but is this just increasing complications and costs?

We also need to look at how centralised systems work and understand if all energy loss is a waste or a necessary function of the system, and, if eradicating energy losses will it improve the system? The answer is not as straightforward as you might think.

Under BS 5422:2023, the minimum level thickness of insulation (25-40mm for 17 to 60mm external diameter pipework) is established for non-domestic hot water service areas to control heat loss. Under this regulation, which gives an average of 9W/m maximum permissible heat loss, secondary losses from centralised systems have reached acceptable levels.

Under this current condition, if we were to apply the maximum permissible heat loss to a 50m run of secondary return pipework, operating for 16 hours per day, the secondary losses would amount to 7.2 kWh/day. So, POU aims to replace the centralised system and entirely eliminate the secondary losses. As a conservative response, we could propose a replacement POU application employing 10 x 15-litre over- or under-sink units. But you must remember that POU also have their own standing losses, which can easily be 0.85 kWh/day. Times this across the specified 10 units, and losses from POU are going to be 8.5 kWh/day. These are averages, so there will be variance, but overall, the energy losses of both systems are going to be similar.

If energy losses are part of both centralised and POU-based systems, and are acceptable within the specification, what are the other considerations?

Let’s take school buildings as an example, where the Department for Education (DfE) currently recommends a variety of approaches to water heating, with centralised systems for catering functions which represent a large, single ‘point of use’ of hot water, while “design and installation shall prioritise the use of local non-storage (or low storage) ‘point of use’ electric hot water heaters. This is to reduce standing losses from centralised systems and to prevent pipework heat loss, increasing the risk of overheating.”

This approach is driving the specification of heat pumps to support the ‘centralised’ kitchen and then large numbers of POU electric water heaters. A recent example of a primary school with 350 students intended to incorporate more than 35 POU heaters for washbasins located throughout the school.

Although units are individually low-cost, at these numbers, the capital investment starts to climb, especially when factoring in the high cost of cabling in each unit. POU electric water heaters are also basic, with no connection to the Building Management System (BMS), so there is no option to highlight a fault, enable the unit or apply time control. That’s compounded by a lack of individual miniature circuit breaker (MCB) to prevent damage or potential fire from an overload or short circuit. Crucially for water heating, which is a business-critical service, there is no redundancy with a POU water heater. If it breaks, there is no hot water at the tap until it is repaired or replaced.

Regular maintenance of hot water systems is a critical part of efficient operation, with regular replacement of anodes and descaling of tanks and in particular electric immersions where high temperature encourages its formation. This is wet, dirty work that, in centralised systems, is contained within the plant room. While the issues of limescale can be virtually eliminated in centralised systems such as Adveco’s award-winning FUSION package electric water heating systems, POU water heaters cannot avoid it in hard water areas and will exhibit scale problems with some variance in time due to the intensity of use. The problem is that building operators do not maintain point-of-use water heaters, so maintenance or, more likely, replacement will be necessitated as the cost of a new unit at £150 does not warrant a £100 maintenance charge.

For this reason, POU systems will be on a rolling replacement program, which will then increase a building’s embodied carbon and landfill waste generation. This also brings maintenance personnel into the occupant’s space. Professional offices do not want technicians working in their toilets, whilst many buildings, such as schools, care homes, prisons, or hospitals, have safeguarding concerns with technicians in occupied spaces, who are then carrying out wet, messy works.

With the drive to eradicate energy losses not stacking up, as POU standing losses are likely to equal or even supersede secondary losses of well-designed centralised systems, most commercial buildings should have a centralised hot water system with secondary return and not POU on every floor of shell and core constructed properties. The centralised system is also able to take advantage of low-carbon preheat, whether in the form of heat pumps or solar thermal, that can continue to evolve the system's ability to reduce dependency on energy, reducing carbon emissions and energy costs across its lifetime. On paper, POU electric water heaters appear to be a quick, easy way to distribute hot water around a building. But the reality is that throughout the operational life of the building, POU is, unless correctly employed as a terminal fixture away from the centralised system, ultimately expensive, problematic and limited in options for future developments.

Case Study: High Demand Water Heating Replacement For Hotel

Large commercial buildings can exhibit large-scale issues when it comes to the end-of-life replacement of domestic hot water (DHW) systems. This was a challenge faced by a hotel located on the South Coast. Boasting numerous rooms and its own spa facility, the hotel was operating a system supplying 400kW of heat from a pair of horizontal calorifiers. But age meant one had already failed, and the second was now leaking. The system offered no backup and threatened loss of business-critical service to the hotel guests and operational functions.

With 25 years of electrical and mechanical experience, Hampshire-based Inovolt was contracted by the hotel to provide the necessary system retrofit with minimal to zero downtime to avoid closure and disruption to business whilst works were concluded. Once on site, it became clear to the team that the project would be more challenging than initially believed. The expansion of the system works with other critical plant items had created a real plant room puzzle, blocking both internal and external plant room door access necessary to remove and replace the old calorifiers. To rectify the situation would typically require intrusive, noisy and messy work. Far from the non-disruptive requirements of the hotel owner.

Inovolt, however, has concluded numerous turnkey projects and saw an opportunity to leverage its building division in support of the necessary refurbishment work. Rather than engaging in expensive, disruptive work to rectify the issues with the plantroom, the team proposed building a plantroom extension on the back wall to house new cylinders, bringing services through the existing wall for final connections.

Faced with very high system demands, Inovolt worked in conjunction with Adveco to find an alternative, selecting a pair of indirect Stainless Steel Twin-Coil (SST) 1500/6.0 Cylinders as replacements. The robust stainless steel construction meant the SSTs would provide the necessary longevity, despite water conditions, and each SST is equipped with a pair of independent internal heat exchange coils designed to serve DHW systems with high capacity needs. Each high-output coil can be used with a separate heat source, enabling effective integration of renewable technologies or multiple heat sources, or alternatively can be combined to increase the heat transfer capacity from a single high-output source. The latter option was employed by Inovolt for a combined coil capacity of 216kW. With both cylinders in operation, they would easily meet the high demands for hot water. To further ensure system resilience, Adveco provided electric immersions for both SST cylinders to supply a secondary heat source should there ever be a failure of the primary heat supply or if peak demand ever exceeds the required levels established for the application design.

Installed vertically, the SST offered a smaller footprint, which made them perfect for installation alongside plant in the new compact extension. With the extension constructed, new cylinders and supporting plant were installed without accessing hotel front-of-house, creating minimal disruption. The final live changeover from the leaking calorifiers and resumption of full hot water service from the new cylinders was executed overnight, with zero downtime of hotel operations.

SST INDIRECT CYLINDERS

Ask Adveco...

How does Adveco help customers navigate compliance with sustainability targets and government policies?

The value of expert advice should never be underestimated. Adveco works closely with building consultants, engineers and installers, helping design, supply or build systems ready for installation. We also commission projects to ensure the system is correctly and safely installed. Our manufacturer-grade warranty service ensures the application continues to operate as intended, so we continue to work with the owner/operator long after the building project is completed. Throughout this entire process, our expert engineers are on hand to advise and ensure systems are efficient and compliant. For new builds, this helps ensure planning approval is not only met but exceeded based on the sustainability specified for the building.

For renovation projects, Adveco can provide a low-cost, non-invasive and temporary metering service to accurately map hot water use in a building. This enables far more accurate sizing of a hot water system, ensuring the replacement design is maximised to address normal daily and peak demands. This aids the transition to more sustainable technology, which is tailored to actual needs. Water heating has for years been plagued with designs that under-size or, more commonly, over-size. So, they do not work properly, or in the latter case, you pay for more system than you need and pay more for their operation. With gas, this was written off as a sensible expense to ensure operational continuity. With an electric system, these costs are punishing, especially if the electrical demand of the building needs to be increased. That can potentially drive up project costs by hundreds of thousands of pounds. That can be avoided with live system data and theoretical modelling for correctly sized systems, which gives accurate oversight of daily and annual hot water demands, annual estimated energy consumption, carbon emissions and operational costs. This enables sustainability strategies to advance as planned, addressing compliance and meeting targets whether set by the business or mandated by the government.

What technologies or solutions does Adveco provide to help organisations reduce their carbon footprint?

There are a series of options available when it comes to more sustainable hot water. For existing commercial buildings, there remains a preference to remain on gas. Adveco continues to supply a wide range of commercial gas water heaters, the current generation of which offers extremely high efficiency matched by smart controls and monitoring. This enables appliances to reduce the amount of gas consumed, reducing carbon and nitrogen dioxide emissions. They also support natural gas, which can be blended with 20% hydrogen – a future technology expected to ultimately replace natural gas for commercial businesses from the mid-2030s through to 2050.

Although not strictly sustainable, these units can be seen as a bridging technology to truly sustainable systems, which retain the familiarity of gas-fired systems. They are very cost-effective to operate as long as gas remains cheaper than grid electricity, which is currently four times more expensive.

For those intending to retain gas services, energy use can be offset through the implementation of solar thermal as a pre-heat system, which offers a proven means to generate at least 30% of annual energy demand for water heating. Solar Thermal requires roof or wall-mounted collectors and employs gravity feed to transfer heat to the building's domestic hot water (DHW) system. If used to offset more expensive electrical heating, solar thermal can currently provide a rapid return on investment.

For new build projects, building regulations mandate an all-electric approach to water heating unless demands are extremely high, in which case, new gas connections may be allowed under planning. Adveco supports this more sustainable option through a range of electric boilers, heat pumps, packaged hybrid systems, ready-to-install plant rooms constructed offsite and a complete solar thermal offering. We also offer the widest selection of cylinders, which essentially act as the battery of a hot water application, storing hot water to meet peak daily demands.
All these approaches can help meet sustainability targets today, demonstrating clear goals and actual investment in buildings.

We are a small London-based office and wondered if we can replace our gas water heater with a water cylinder and immersion?

As a high-temperature heat source, an electric boiler is capable of providing temperatures of up to 75°C and should be used in place of an immersion heater, as these are not designed for primary heating. Immersions are relatively costly to purchase and operate and prone to rapid limescale development and failure in hard water areas, so they should only be incorporated as a backup for additional system resilience. Specifying an electric boiler with a compact indirect cylinder is far more advantageous, preventing scale deposition, as well as delivering further system redundancy since the boiler will incorporate multiple immersions within its chassis.

What is the best approach for a low-carbon, low-cost domestic hot water system in a new build property?

In our opinion, the simplest approach blends preheat, such as from an Adveco ADV-W ASHP with, for example, the Adveco ARDENT electric boiler to supply thermal energy to a mains water-fed compact indirect cylinder. Balancing such a hybrid electric system is key to ensuring efficient operation, so consideration needs to be given to controls to ensure the water heating remains consistent and that the two technologies do not fight each other. Working in a balanced combination enables systems to be sized down by as much as half in terms of ASHP requirements. This delivers immediate capital savings as electric boilers are far less expensive compared to an

equivalent heat pump. You also immediately reduce the physical size of the system, embodied carbon and demand from the electric supply.

NET ZERO & HOT WATER

Sustainable Hot Water

FUSION

Adveco's FUSION packaged electric water heaters offer a range of low-carbon, all-electric applications for commercial projects with a wide choice of pre-sized variants combining ARDENT electric boiler, cylinder, ASHP, controls and immersions.

FIND OUT MORE

ADV65-110W ASHPs

ADV65-110W is an integrated air-to-water heat pump system that provides an energy-efficient method to secure low-carbon domestic hot water (DHW), as well as space heating and cooling for larger commercial buildings.

FIND OUT MORE

ARDENT Electric Boiler

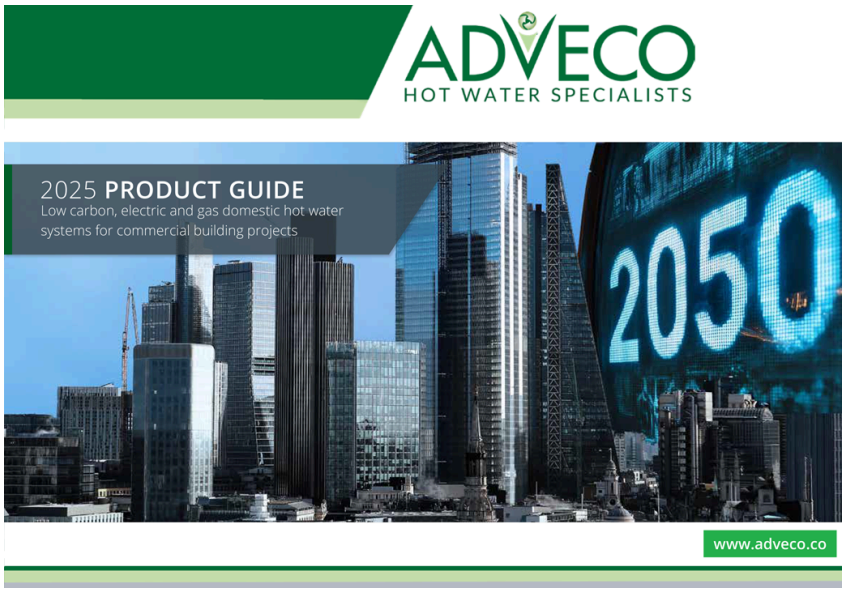
ARDENT is designed to serve as an indirect water heater or heating system. Wall-hung and oorstanding variants for those seeking to avoid a reliance on gas energy supplies. In hard water areas the ARDENT electric boiler can be used to dramatically reduce the costly build up of damaging limescale.

FIND OUT MORE

Adveco 2025 Product Guide

Get the handy guide to Adveco's current product range for 2025

2025 PRODUCT GUIDE



Discover Adveco's expanding range of low carbon and renewable products

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Solar Thermal Systems
ADV16-30W ASHP
ADV65-110W ASHP
ADVS10-16W single phase ASHP
FPi R32 monobloc Air Source Heat Pump
FUSION packaged electric water heaters
Electric Boilers
Hot Water Cylinders, Indirect Water Heaters, Calorifiers & Buffers
Commercial Gas-Fired Water Heaters
Standalone Heat Recovery from Chillers
Offsite Constructed Packaged Plant Rooms
Premium Chilled Water Systems

01252 551540
Enquiries@adveco.co