Welcome to Adveco's September newsletter,

It has proven to be another busy Summer, and we kick things off this month with a deeper dive into the new FUSION TW & TWplus, which enhances emission reduction from electric water heating as well as making better use of heat pump pre-heat to offset direct energy costs. The integration of the ADV-W ASHP has been at the heart of the new FUSION developments, and our work on developing heat pump systems for DHW, which culminated in the ADV-W and ADVS-W ranges, has also been recognised this month with the range being short-listed for Commercial Heat Pump Product Of The Year in the 2025 Heating & Ventilation Review Awards.

Continuing on from recent advice relating to the trend to decentralise hot water provision, we take a further look at current recommendations being given to schools and outline efficient, lower-cost means of securing sustainable hot water systems through the use of hybrid systems such as FUSION. We also respond to questions on this hybrid approach for sustainability, as well as transitioning from gas to electric and things to be aware of when using electric for DHW, plus our thoughts on the current generation of high-temperature heat pumps. And we round things off with the latest news and guidance for those seeking building control approval applications for higher-risk buildings...

FUSION TW & TWplus Reimagine Hybrid Electric Water Heating

Adveco has reimagined its award-winning lower-carbon FUSION packaged electric water heater system with new models that take advantage of the more powerful ADV-W air source heat pump (ASHP), enhanced controls, and a greater choice of backup immersion heaters. For commercial organisations with sink-led hot water demands, taller buildings with basement plant rooms or operations that rely on 24/7 hot water supply Adveco FUSION TW provides the most comprehensive response available today.

- *All-new packaged renewable water heaters (FUSION TW / TWplus)*
- *Lower carbon Fusion cuts DHW emissions by up to 68% compared to equivalent gas systems*
- *Increased choice of system preheat and greater backup options*
- *Enhanced system controls*

The all-new FUSION-TW and TWplus packages take the existing sealed primary loop combination of ARDENT electric boiler and ATST twin-coil cylinder and now add a range of monobloc ASHP alternatives with the new FUSION Control Box for greater carbon reduction and increased system output for more demanding hot water applications.
FUSION-TW and TW-Plus gain a wider choice of compact, pre-charged R32 ASHPs, which are easy and safer to install, especially when space is limited, and operate quietly. System preheat is generated by either a 10 – 16 kW single-phase ADVS-W ASHP or a 16-30 kW ADV-W in three-phase capacity. With an A+++ ERP energy rating, and high SCOP with water outlet temperature 60˚, the ADV-W will maintain a consistent supply of hot water at up to 55˚ to pre-heat the FUSION system.

The TW-plus plus variants include either a 6 or 12 kW electric backup immersion for no single point of failure for assured delivery of hot water without downtime.
Balancing these system elements is a critical function of the design, and smart controls ensure contribution from the ASHP is maximised to deliver a working flow of 50-55˚C at an ambient operating temperature of 2˚C, setting a realistic benchmark for operating conditions in the UK. FUSION's new enhanced controls not only optimise the mixture of pre-heat from the heat pump, but they also manage the elements within the electric boiler and backup immersion. This ensures the electric boiler is not required to work as hard to raise flow temperatures to the 65˚C demanded by commercial applications, reducing maintenance demands and improving the longevity of the boiler.

Adveco has released new single- and three-phase control panels supporting both ADVS-W and ADV-W variant ASHP. 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 a GSM module, fault notifications can be enabled from the BMS or via text. The new controls also provide the option to prevent immersion activation when ASHP goes into fault to limit current.

With storage capacities ranging from 300 to 750 litres provided by the corrosion-resistant, stainless steel, high-pressure indirect cylinder, nominal power output ranges from 19 kW to 52 kW in FUSION-TW.

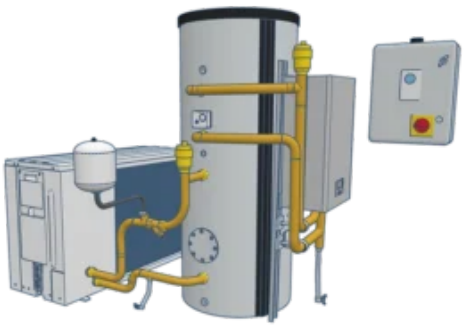
FUSION TW variants will support instantaneous draw off from 130 to 315 litres/hour and continuous flow rates starting at 323 litres and climbing to 883 litres per hour. With the ASHP able to contribute up to 70% of system heat, FUSION systems will offset some of the direct electric energy demands, meaning it can help control daily energy costs as well as extend the life of the electric boiler. Carbon emissions compared to electric-only systems are cut by as much as 48% and up to 68% when compared to gas-fired equivalents.

Greg Brushett, sales director, Adveco, says: “FUSION continues to change the way low-carbon water heating can be specified in commercial buildings. It allows for highly optimised applications which can be provided off-the-shelf in pre-sized, ready-to-go systems with a smaller footprint, that are easier to install, more efficient and cost-effective to purchase and operate.”

FUSION provides assured operation, fully countering limescale in hard water areas, whilst tough enough to prevent the corrosive action of soft water. And with new system enhancements, support for single and three-phase specifications, plus greater power output for even larger projects, lower carbon FUSION offers the means to realistically meet net zero strategies today. Adveco is also able to support bespoke commercial projects applying FUSION’s hybrid system approach for more complex and demanding application designs.

Key features

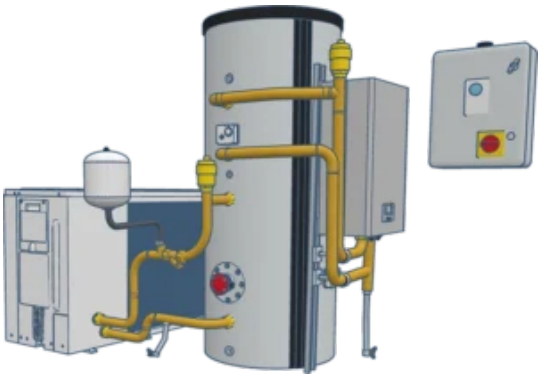
FUSION TW



- High-quality ATST twin coil stainless steel vessel with mounting points & brackets
- Available in 300 – 750 litre capacities
- Cylinder pressure 10 bar as standard
- 9, 12 or 24 kW electric boiler
- 10, 12 or 16 kW single-phase air source heat pump
- 16, 22 & 30 kW three-phase air source heat pump

- Pre-built pipework (left or right)
- FUSION Control Box
- Compact space-saving form factor
- 25 pre-sized variants from 19 to 52 kW

FUSION TWplus



- 6 kW or 12 kW electric immersion
- FUSION Control Box & GSM remote alerts
- 25 pre-sized variants from 19 to 52 kW

FUSION

Testing Times - Sustainable, Cost-Effective Water Heating In Schools

According to the National Audit Office (NAO), there are more than 32,000 schools and early learning centres throughout the UK. These sites represent a great variety of buildings in terms of age, size and design, each averaging approximately three buildings. This real estate, of close to 100,000 buildings, represents a considerable source of carbon emissions despite ongoing new build and modernisation programmes.

The requirements for hot water, from kitchen services to basins and showers, can equate to as much as 30% of daily energy demands, so more efficient, and crucially lower cost means of securing

water heating services should be a paramount element of school planning before we even consider the advantages of improving sustainability.

The Department for Education (DfE) currently recommends a variety of approaches to school hot water generation, with centralised systems for catering functions which represent a large, single Point of Use (PoU) 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. The problem is that specifications derived from this advice inherently lead to system oversizing, which equates to greater capital investment and operational costs. A real-world example recently presented to us required a system based around a pair of 50kW CO^2 heat pumps and a 1500L buffer to provide water for three sinks and three wash hand basins in a primary school kitchen. The 350 pupils would have hot water supplied in classrooms and toilets by PoU water heaters, essentially small boilers above each sink. The capital cost of this specification would be approximately £150,000. If it is assumed that funding allocated to each student is £8,000, this specification at £430 per student equates to a staggering 5% of annual funding. That is simply not good enough.

The drive to adopt this technology is being pushed by zero-carbon goals, but is this even the right approach for school hot water?

First and foremost, heat pumps are not a zero-carbon technology. They have an operational electrical demand, and nothing becomes carbon-free until the grid does. That also includes electric boilers. Better we refer to heat pumps as a low-carbon technology. If an electric system can be engineered to save a little less carbon for a lot less outlay, and it passes Part L of the building regulations, then it is a better design. For this reason, electric only is being stipulated in essentially all new school buildings. For the large proportion of schools operating existing buildings, the push is clearly to emulate this trend and transition to electric. Even at the macro level, the UK is incapable of making the jump to net zero in a single bound, hence the imposition of government driven carbon budgets to deliver a gradual step-by-step process.

The same must be the case for schools. Faced with budget constraints and ageing buildings, there is going to be resistance to change, especially when you start comparing the costs of electricity versus existing gas, with electricity varying from four to five times that of gas in recent years. That's a big hit to ongoing budgets if not correctly factored in. This reticence to move off gas led the government earlier this year to relax the timeframe for phasing gas out, meaning new gas appliances can continue to be installed until 2035, although the expectation is that from next year, all new gas water heaters must be able to accept a blend of natural gas and hydrogen. Current generation units already offer this option without requiring hardware updates, so the industry is well provisioned to meet demands. With improved efficiency comes appliance longevity, meaning there will still be many operational gas boilers in 2050. That immediately greys the line for net zero in 2050, but the implication is that by the 2040s hydrogen replacement will be advancing rapidly nationwide, and government schemes to switch over to hydrogen appliances will be in place.

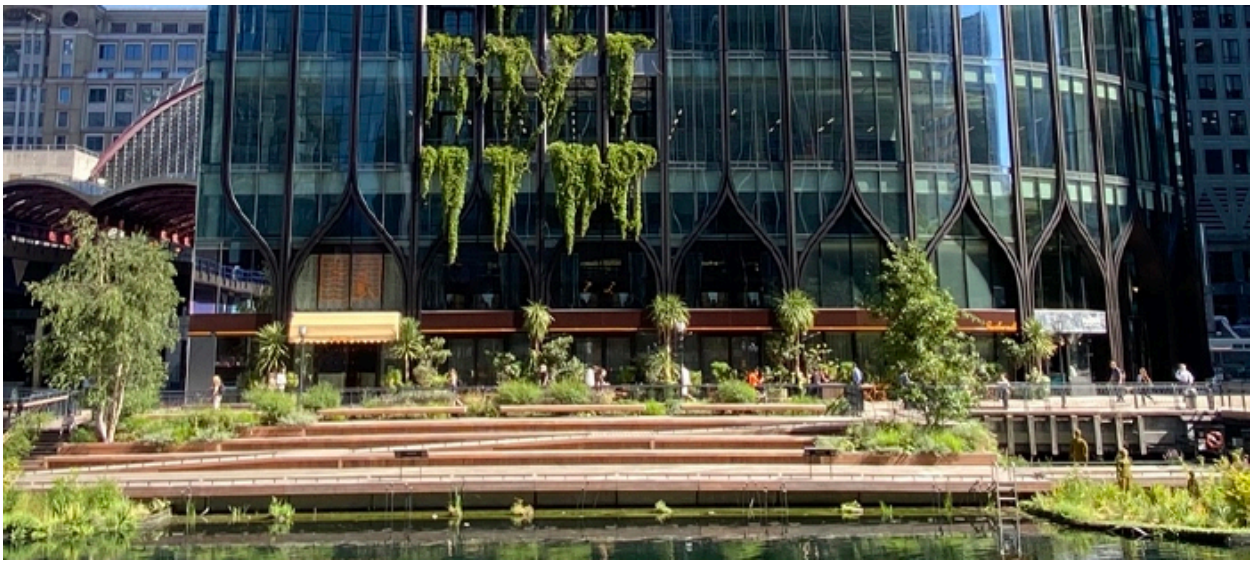
Modernising gas water heating through retrofit shouldn't be reviled in terms of sustainability but rather be seen as a necessary stepping stone to affordably transition the large proportion of school buildings towards true net zero by 2050. There is no reason for new buildings to change path. They should continue to be all-electric, but to make this viable, and also enable schools that choose to transition faster to electric, requires a move back to better engineering instead of choosing lower carbon regardless of cost strategies.

Equipment selection, whether electric or gas, should be made based on performance, safety, environment, but also critically on capital cost and ongoing running costs. Would you rather pay £150,000 for a CO^2 heat pump and PoU system, or gain a well-designed hybrid electric system that can do the same job and at just one tenth the cost? A system that could offset as much as 70% of the costly direct electric energy demands by using a heat pump more efficiently to supply pre-heat, rather than direct high-temperature heating. This is the thought process behind hybrid design, which takes the best of low-carbon technologies and combines them to gain greater effectiveness. Despite initially seeming a more complex approach, it allows for smaller, more compact appliances to be deployed in pre-sized arrangements, and this allows for a reduction in costs, simpler installation and better daily management from the necessary integrated controls. Adveco has been championing this approach for several years, beginning with bespoke iteration, which evolved into the multi-award-winning FUSION. By combining an electric boiler and storage cylinder, FUSION offers an indirect water heater configuration that, with balancing controls, can be integrated with a range of heat pumps to preheat water and offset much of the boiler energy demands, since it is required to simply top up heating and meet extra peak demands. An immersion can also be included to provide a backup heating option, ensuring there is no single point of failure where hot water services are deemed operationally critical.

FUSION has been conceived to support basin-led demands, whether in a new build property or one seeking to transition from gas to electricity. It is a centralised system, so would be located in the existing plant room or can be installed within a packaged plant room to take advantage of unused exterior space and free up more internal space, to extend a classroom, for example. This compact, preconfigured approach gives more options and, crucially, is how systems can be delivered at a much lower cost.

As with the more expensive systems, FUSION uses the same grid electricity source, so both options will ultimately become carbon neutral at the same time.

Commercial Water Heating...Questions & Answers



Why are hybrid water heating systems more sustainable?

Despite the best efforts of manufacturers, in terms of sustainable alternatives to gas water heating, there is still no single, cost-effective technology that meets the exacting demands for safe hot water provision. That is, providing the water at high enough system temperatures (+60°C) to ensure there is no danger of a Legionella outbreak. This is why the hybrid approach to water heating is so advantageous since it combines multiple technologies, such as electric and heat pumps and/or solar thermal, maximising efficiency to reduce energy demands, carbon emissions and running costs.

Air source heat pumps (ASHPs) have become the popular option for heating and hot water.
The technology works the same way as a fridge, only in reverse, drawing heat from often cold ambient air by compressing a refrigerant. This means the technology is very efficient when operating at lower temperatures, making it excellent for space heating where system temperatures can be low (35-40°C). The technology will struggle to meet the higher temperatures required for water heating, increasing the demand for electricity as efficiency drops, thus costing more to operate. The sweet spot is to push the heat from the ASHP to 50-55°C, giving the best value in terms of consistent heat generation versus cost. This is fed to the hot water system as preheat and then topped up to meet peak demands by the primary electric boiler, or an immersion, which acts as a system backup. This is an optimal hybrid system for small to mid-sized buildings, as it maximises the heat pump, enabling smaller, more compact, quieter and lower-cost ASHPs to be implemented. Larger, more complex structures can also integrate solar thermal as a mid-heat function.

We are considering an electric and heat pump system for my building for water heating. Are there any common pitfalls we need to avoid?

The value of air source heat pumps (ASHP) is that they can achieve carbon reductions of 42-47%, whilst saving 25-35% of the energy costs when compared to an equivalent-sized direct-electric only system (i.e., from the grid). It is, however, a technology that operates most efficiently at lower temperatures. Still, domestic hot water (DHW) systems for commercial properties require a 60°C working flow for safe operation and anti-legionella processes. This does not prevent the use of ASHPs as they can be pushed to deliver a higher percentage contribution, generating working temperatures of 45-50°C for preheat. This is attained at the cost of performance efficiency, requires electrical energy, and has operating cost implications.

Your system will still be required to top up the heat to the necessary 60°C, which is best achieved with an electric boiler. It is important to recognise that this, combined with the heat pump's reduced operational efficiency, means it will still be much more expensive to run than an equivalent-sized gas-fired system. The recommendation in this case is to keep electrical demand down by increasing the size of the hot water storage, which is then heated more slowly. A 30kW energy source can heat 750 litres/hour by 34°C, so when the system draws hot water at a faster rate than it can be heated to 44°C, such as for hot showers, you would get complaints that the water is 'cold'. Integrating a larger volume cylinder helps to overcome this undersizing, allowing for a two-hour reheat cycle that maintains enough water at 60°C to meet daily demand, whilst slowly heating reserves through the night when demand is minimal to meet the morning peak. This is a very different approach to the high energy input and low storage seen with traditional gas-fired systems.

What do you think about high-temperature heat pumps for DHW?
There are new 'high temperature' heat pumps available on the market, which use either CO_2 or propane (R290) as natural refrigerants, but both technologies have issues that require overcoming. CO_2 systems still struggle to attain efficiency and have a tendency to shut down when there is a warm system return, which is common in commercial hot water systems.

Propane in heat pumps is currently unrestricted, which has raised a red flag with BESA, as it has concerns over the transportation, storage, and use of the technology due to its high potential for flammability. Given

the latest building regulation changes in the wake of the Grenfell enquiry, Adveco is currently advising against the integration of propane-based heat pumps until regulations on their use are clarified.

We are investigating the options for moving from an existing gas water heating system to a more sustainable technology. What do we need to know?

It's important to realise that carbon savings and costs are not aligned. As an example, if we take a building with an average occupancy rate of 23.5 with provision of basins, and shower/wet rooms, typically seen in student accommodations, care homes or boutique hotels, the yearly running costs resulting from a change from gas to direct electric would increase from £1019 to £3019 (based on electricity on average currently costing as much as 3.8 times that of gas). Even with an ASHP operating at optimum efficiency (for 35% recorded reduction in energy), costs would be £2862. Close to three times that of gas alone, so it is inherently important to consider the nominal value of the carbon reduction, especially if planning a refurbishment from gas to electricity. Ensure your sustainability strategy takes into account both the capital investment and running costs when balancing against carbon reduction gains.

As you are already gas connected, it may be worth considering updating your gas water heating and supplementing it with either solar thermal or air source heat pumps to offset primary heating demands, to lower energy consumption, costs and carbon e missions. This approach provides a level of futureproofing and a bridge to new technologies, such as green gas, expected to develop in advance of the 2050 net zero deadline.

DHW HANDBOOKS FOR COMMERCIAL BUILDINGS

Delays & New Guidance For Higher-Risk Building Applications

The Health and Safety Executive (HSE), acting as the Building Safety Regulator (BSR), has released data on building control approval applications for higher-risk buildings (HRBs) in England, from October 2023 to March 2025.

HRBs are those with at least seven storeys, are at least 18 metres high, are a hospital or care home, and/or contain two or more residential units. Building control approval is a statutory requirement, necessary for HRB projects to pass Gateway 2 – a stop/go point where work on HRBs is assessed against building regulation requirements before it's allowed to take place.

According to the regulation, decisions on building control approval applications for new build HRBs must be made within a 12-week determination period. Decisions for work on existing HRBs must be made in eight.

The new data shows that delayed decisions on HRB applications made for building control approval of work on new and existing HRBs in England increased by 443% between 1Q2024 and 1Q2025.

In the first quarter of 2025, 155 (60.3%) of 257 decisions on applications were delayed. By comparison, 35 (29.9%) of the 117 decisions made in 1Q2024 were delayed.
The jump in delayed decisions appears to have been driven by growth in the BSR's caseload.

The total caseload in 1Q2025 was more than triple (323%) the caseload in 1Q2024. Meanwhile, the percentage of applications where decisions were made within the determination period, fell from 70% to 33% in the same period.

Delayed decisions on higher-risk building applications have a wide-reaching and detrimental impact on the construction sector. BCIS expert panellists – cost consultants whose experiences help to inform movement in our tender price indices – have reported that approval delays at Gateways 2 and 3 are having a significant impact, pushing back project starts and putting pressure on resource management.

According to the data, the BSR has not performed effectively since 2Q2024. The median time taken for decisions where an application was approved rose from 13.7 weeks in 1Q2024 to 25.1 weeks in 1Q2025. The only decisions consistently made on time in this period were for invalid applications – those that do not pass the validation process or have been marked inactive with no determination made.

Looking at caseload trends, there were over 1,000 applications still awaiting a decision at the end of March 2025. This was a 451% increase on the backlog recorded at the end of March 2024.

In most cases, making decisions within the determination period is a statutory requirement, and with a growing caseload, the need for process reforms has become clear, with BSR announcing that a new 'Fast Track Process' with building inspector and engineer capacity is to be introduced to support housebuilding activity. There has yet to be confirmation of an equivalent process for commercial projects.

New Practical Guidance
With application delays becoming a clear issue for projects the Construction Leadership Council (CLC) established a joint BSR and industry Task and Finish Group earlier this year to review the project journey through the building control process to improve the quality and achieve greater consistency of the industry submissions and speed up the responses from the Regulator. As part of this process the CLC has just published a suite of guidance on Building Control Approval Applications for a new Higher-Risk Building (Gateway 2).

This guidance has been produced in collaboration between the CLC, industry stakeholders and the BSR. It provides the baseline principles to guide those involved in submitting and assessing applications for Building Control Approval for Higher-Risk Buildings and includes practical recommendations on the approach and submission of relevant information.

The guidance suite is summarised in a single Document and covers:

- Guidance Note 01 – The Building Safety Regime for a new Higher-Risk Building
- Guidance Note 02 – Sufficient Level of Design

- Guidance Note 03 – Approval with Requirements
- Guidance Note 04 – Application Information Schedule
- Guidance Note 05 – Application Project Brief
- Guidance Note 06 – Application Document Management and Submission
- Guidance Note 07 – Application Strategy

The CLC and BSR regularly engage to address the Grenfell Inquiry recommendations, industry culture and performance challenges. Applications that clearly demonstrate compliance are approved faster, and everyone in BSR wants those designs and plans off the page and onto the site as quickly as possible.

To ensure compliance and gain assured design in the initial project phases to avoid the need for changes and subsequent delays, it is critical to consult with qualified specialists. This is especially so with potentially complex systems, such as when working with a business-critical hot water application. So talk to Adveco as early as possible with regard to your commercial project's needs in higher-risk buildings.

DOWNLOAD THE CLC GUIDE **HOT WATER FOR HRBS**

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

ADV16-30W ASHPs

The ADV-W air-to-water heat pump range includes 16, 22 & 30kW (3 phase) and 10, 12, & 16kW (single phase) models able to provide hot

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

combining ARDENT electric boiler, cylinder, ASHP, controls and immersions.

FIND OUT MORE

water output up to 60°C throughout the year for 55°C working flow.

FIND OUT MORE

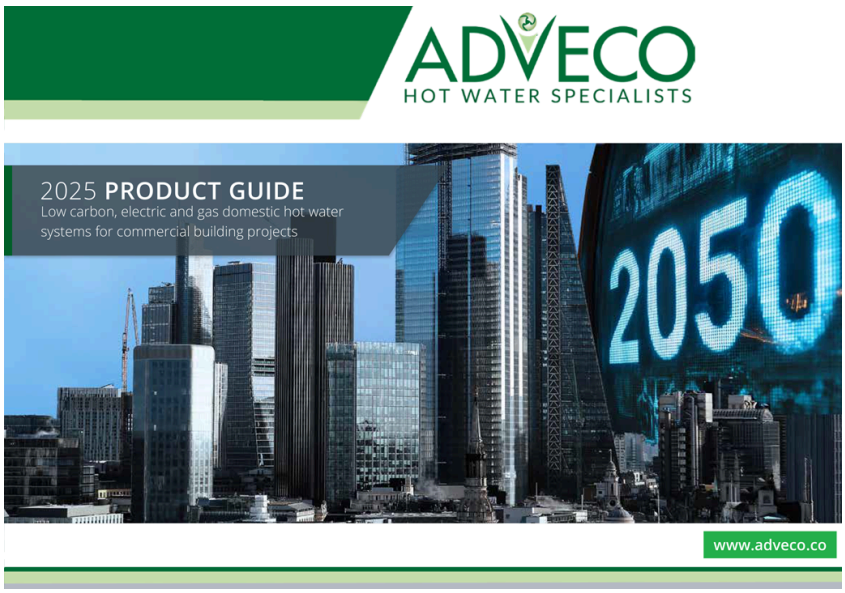
ARDENT electric boiler can be used to dramatically reduce the costly build up of damaging limescale.

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

Live Metering
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

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