Welcome to Adveco's February newsletter,

This month, we start by proudly introducing Astute, the new range of intelligent gas water heaters for easy replacement and upgrade of existing gas-fired systems. We also outline important questions which need to be addressed before refurbishing existing gas-fired water-heating systems. We take a look at how best to approach electric-based hot water applications that advance system capabilities beyond the immersion.

One sector with an absolute critical need for hot water is healthcare. We close out this month by assessing the challenges the NHS faces as it seeks to decarbonise its facilities nationwide and explain how Adveco's approach to hot water can answer its needs now and into the future...

Introducing the Astute® Range of Intelligent Commercial Gas Water Heaters

The Astute® range of intelligent commercial gas water heaters has been developed exclusively for the UK market. Astute features five water connections on the top, back, and front of the units, along with versatile flueing for ease of installation, making retrofitting older systems straightforward, even if converting to high-efficiency gas.

Astute is designed to meet the needs of a wide range of commercial properties. Astute launches with 14 variants offering heating output capacities from 22 to 111 kW and storage volumes ranging from 190 to 380 litres. All provide up to 98% thermal efficiency. Patented triple pass heat exchanger design constructed of high-quality steel and advanced power anodes minimises wear to extend the unit's life, even in aggressive soft water areas where more expensive stainless steel appliances would traditionally be required.

Developed with smaller organisations' buildings in mind, the 190 and 284-litre, 22 to 28 kW models provide a smart, robust water heater for sites such as cafés, retailers and primary schools. The 300 and 380-litre variants, available from 37 up to 111kW, provide additional capacity for businesses with greater hot water demands, including restaurants, schools and colleges, hotels and residential care homes.

Greg Brushett, Sales Director, Adveco, said: "The highly efficient Astute water heater range with built-in intelligence, easy installation, durability and a wide range of size and connection options provides a comprehensive choice for retrofit in the UK commercial marketplace. Especially properties in soft water areas, which have until now had to make do with limited, costly choices and those seeking an optimal response for retrofitting a wide variety of ageing hot water systems. Building owners and operators now also gain the ability to better manage energy demands as well as detect and deal with problems before they become critical, ensuring their business is not penalised with any downtime."

Astute also features the industry's most advanced and accurate leak detection system. LeakSense®, which is factory-installed to ensure proper alignment and accuracy, can, in the long term, identify and alert users of a leak smaller than a single drop of water as appliances approach the end of life. This helps to plan for replacement, ensuring little to no downtime for continuity of service for business-critical hot water demands.

Astute® units feature:

- Advanced diagnostics allow for proactive monitoring of the systematic health of the tank by providing alerts and maintenance reminders to help extend the life of the tank
- EcoNet® Wi-Fi connected smart energy use monitoring technology, with remote-control options via the EcoNet app available from the Appstore and Google Apps
- Integrated Building Management Systems (BMS) connectivity via BACnet (MS/TP)
- LeakSense® is an intelligent leak detection system that identifies a leak and provides real-time leak notifications
- Astute units include a market-leading five-year warranty on the tank and two-year parts and labour

LEARN MORE ABOUT ASTUTE

Retrofitting Gas Systems for Better Performance

Today, the UK commercial built estate consists of close to 2 million properties. Just 14.6% were constructed after 1996, meaning the broad majority will have been constructed to lower energy

efficiency standards and will require substantial modernisation in the coming years. Especially if they are to address the sustainability goals of this country. These older buildings represent approximately a quarter of the UK built environment's operational emissions.

Given that as much as 30% of daily energy demands can be attributed to domestic hot water (DHW) systems, addressing inefficient and usually fossil fuel-based technology is a great place to kick-start decarbonisation activities through a choice of relatively low-impact and affordable options.

Despite the drive for decarbonisation, like-for-like gas retrofit continues to be popular. Gas-fired systems are well understood, are excellent for achieving high water temperatures necessary for safe commercial operation, and gas prices currently remain considerably lower than electricity.
While new build properties are prevented from adding new gas connections under current building regulations, the majority of existing commercial buildings will have been specified for gas connection and may continue to use it as an energy source for space and water heating. There remain no mandates to prevent the purchase of new gas boilers and water heaters, and proposed government bans set to be enacted in the 2030s have currently been repealed.

Most commercial buildings will therefore have used gas boilers and water heaters as a tried and trusted means of meeting daily hot water demands in a very cost-effective manner.

Given that existing systems will have long operational lives, replacing them with anything new is advantageous for all involved. The current generation of condensing gas water heaters offers greater efficiency when burning gas and transferring heat to water, through improved construction of the burner and heat exchanger and smarter operation that maximises heating to hot water demand and reduces lost heat in flue gases.

What to take into account when replacing Gas Water Heaters

A good replacement proposition for retrofit will meet a broad checklist of requirements if it is to be suitable for universal retrofit…

This starts with planning a like-for-like replacement. Where is the building situated geologically? – This sets parameters based on the water quality. Hard water areas are better served by indirect heating to reduce limescale, whereas soft water locales will be prone to corrosion, so more robust construction from stainless steel or enhanced porcelain application would be recommended.

You also need to understand the challenges of your buildings. Does the replacement unit fit through a standard door? Does it need to navigate steps? So how heavy is it?

Would two smaller units be more easily installed, meeting the same hot water demands and possibly be lower cost when compared to a single large unit?

How much pipework needs adapting or replacing? Are there isolation valves on the current heaters? Do they hold, or are they passing? And can you make the new pipework from the existing valve, or do you have to cut back further than the valve?

Have you accounted for proximity to a drain to pipe away condensate or provide for drain-down maintenance?

Is the building's flue still fit for purpose and correctly installed?

An appliance that offers multiple connection points offers the best means of replacing an old water heater quickly without major alterations to pipework, reducing both system downtime and

pipework costs.

It is also sensible to consider a shorter unit. Although an appliance's capacity may be reduced, efficiency gains can more than make up for the difference.

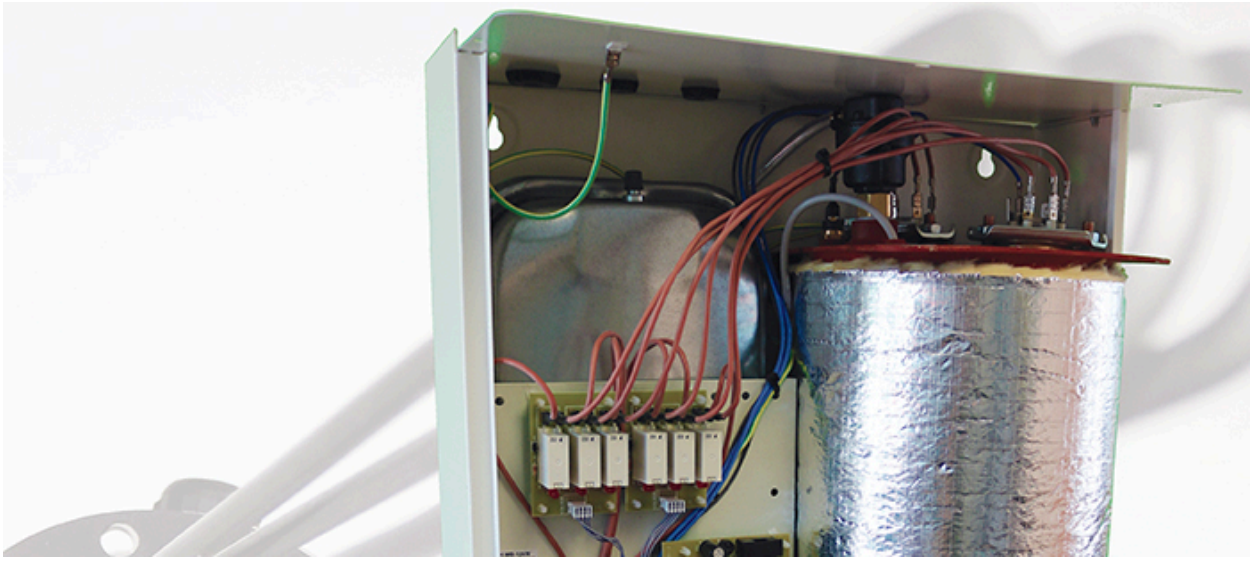
Flueing is a critical safety consideration with gas installations. Aluminium flue, for example, has an expected lifespan of around 15 years. If the old water heater is close to or older than this, it is imperative that the flue also be replaced. An old non-condensing negative draught flue is also not suitable for new condensing appliances.

It is important to remember that changes to regulations may make the original terminal location unsuitable. Always check flue connections and kits available for the replacement water heater to ensure it can meet or improve on the existing installation.

To ensure system longevity, the value of investment and ongoing efficiency look for advanced features such as onboard energy and water use metering, remote connection such as wifi for app-based control and management, or connectivity to the building management system (BMS) for remote fault alarm and monitoring/control.

Most modern gas appliances will also support a 20% hydrogen blend without modification, providing a bridge to future green gas alternatives available from the grid.

Electric Water Heating Beyond The Immersion



The increasing urgency to decarbonise commercial buildings has placed centralised electric water heating systems at the forefront of modern building services. While the simplest approach—direct immersion heating—offers a straightforward path to electrification, it is fraught with critical limitations concerning efficiency, reliability, design complexity, and maintenance. Successfully implementing a high-performance electric hot water design requires moving beyond basic direct heating towards indirect systems utilising advanced components like electric boilers.

Centralised electric water heating systems often begin with the concept of using immersion heaters within a large storage tank. These systems typically fall into two categories: prewired electric water heaters or bespoke buffer-with-immersion designs.

Pre-wired electric water heaters offer the advantage of having multiple heating elements prewired across three phases, providing an inherent degree of redundancy. This is crucial for commercial reliability, as a single element failure does not necessarily cripple the entire system. However, these prewired packages face significant hurdles. Generally expensive for the technology offered, tank size is also limited, typically to 300 litres due to EcoDesign regulations, thus restricting their use in large-scale commercial applications. While prewired for basic control, they often have limited compatibility with sophisticated Building Management Systems (BMS), hindering overall building efficiency management.

Given their limited availability of pre-wired water heaters in the UK, and that they fundamentally suffer from severe scale problems in hard water areas, designers often prefer bespoke systems due to the versatility they offer in selecting components – a standard cylinder coupled with one or multiple immersions. But this versatility is often undermined by the complexity and cost of the required controls and switchgear, something frequently overlooked in the tendering process. Creating a sophisticated bespoke system requires the expertise of a controls designer, a panel builder, and an installer, leading to significantly high costs. Crucially, the responsibility for this work often falls into a contractual grey area.

The system is usually tendered by the mechanical contractor, who may not fully appreciate the necessary electrical control work. The specification for the water heating is often missing from the electrical section of the tender, causing the electrical contractor to miss it entirely. This ambiguity leads to project delays and costly variations.

Furthermore, the resultant one-off design is often overly basic, lacking essential modern features such as soft start/stop, modulation, and BMS compatibility. Unfortunately, getting this complex electrical/mechanical integration wrong without ample experience is all too easy.

For high-demand domestic hot water (DHW) demanded by commercial buildings, designers frequently will default to large immersion heaters. This is not the optimal technical response due to high costs, high electrical load, and a lack of redundancy. Also, a severe operational problem arises from the combination of large immersion heaters and internally mounted thermostats. When the sensing point of the thermostat is in close vicinity to the element where emitted heat rapidly increases the temperature, the internal stat will turn the immersion off before the bulk cylinder temperature has been raised significantly. The heat then rapidly dissipates into the surrounding water, causing the stat to immediately turn the immersion back on. This rapid cycling leads to two catastrophic failures. Localised overheating occurs due to the stacking, while the constant cycling of the contactor can eventually cause it to weld shut, creating a dangerous safety issue. A key design rule is that the contactor should never be used as the overheat safety shut-off method. The recommended approach is to use a separate packaged thermostat located approximately 300mm above the immersion heater.

A far better direct option is to employ multiple small immersions with multiple stats, as this configuration provides inherent redundancy and actively prevents large load spikes, mitigating issues like voltage instability, damage to sensitive electronic equipment, and lighting flicker. However, this approach necessitates the use of special cylinders with many ports, once again leading to increased system cost and complexity.

The Case for Indirect Heating

All direct electric water heating systems, whether prewired or bespoke, share the same fundamental drawbacks. They are basic, expensive for the level of technology, and highly susceptible to scale formation. The best technical answer to the scale problem is to find an alternative, indirect way to heat the water.

Indirect hot water cylinders are well understood and long proven to not build up scale at the same rate as immersion heaters. In these systems, scale formation over a long period does not cause the failure of the heat source, a heat exchanger coil. Furthermore, indirect cylinders are not constrained by the 300L EcoDesign limit, provided the standing loss limits are met, enabling the design of large commercial systems.

The optimal approach is to deploy an electric boiler which utilises immersion heaters within a vessel acting as a heat exchanger, creating a primary loop. When paired with an indirect cylinder, this approach offers significant advantages, as the primary loop separates the immersion heaters from the mains water. This virtually eliminates all scale buildup on the heating elements. The electric boiler also comes with built-in controls, including all necessary switchgear, BMS communication (enable, fault relay), soft start/soft stop, and modulation.

This configuration creates an electric hot water system providing a high level of performance and reliability. It is easy to install, use, and maintain, often resulting in low initial outlay costs when compared to complex bespoke direct systems and helps eliminate the complex and error-prone bespoke electrical design process.

While an electric boiler and cylinder system consumes nominally the same energy as a direct electric system, the benefits of integrated control, reliability, and maintenance outweigh the marginal energy difference. This combination represents a limited space consumption response that provides a robust, reliable, and high-performance electric hot water core.

The final step in creating a truly sustainable and low-cost-to-operate system is to add a low-carbon preheat source, such as an air source heat pump (ASHP) or solar thermal system. This integration utilises the electric boiler as the high-temperature booster and backup, leveraging the low-carbon source for as much as 70% of the energy input, maximising carbon savings and minimising operational costs.

EXPLORE ELECTRIC WATER HEATING FROM ADVECO

Building A More Sustainable Healthcare System

The National Health Service operates one of the largest and most demanding building estates in the country, spanning hundreds of hospital sites, over 200 NHS trusts, and more than 6,000 GP practices in England alone. Across their estates, the need for reliable, resilient hot water and heating

is non-negotiable, underpinning infection control, patient safety, catering, and day-to-day operations.

Yet much of this infrastructure is ageing and decreasing in efficiency with rising demand and new net-zero targets. As waiting lists remain high and services expand beyond their original design capacity, existing plant rooms are being pushed harder, often without the space, budget, or downtime for full replacement. While national programmes promise new hospitals and upgraded primary care estates, the immediate challenge lies in modernising and decarbonising hot water and heating systems. This creates an urgent need for scalable, efficient technologies that can reduce carbon and running costs while maintaining the uncompromising performance standards healthcare settings depend on.'

We recognise the critical importance of a sustainable healthcare system. The decarbonisation of the NHS is now a national priority, as the world's first national health system to commit to reaching net zero, it has set ambitious targets to deliver net zero operation by 2040 for direct emissions (NHS Carbon Footprint) and by 2045 for emissions it can influence (NHS Carbon Footprint Plus). These commitments are not merely aspirational; they are essential for protecting public health from the impacts of climate change and ensuring the long-term viability of our healthcare infrastructure.

The NHS's Decarbonisation Journey

The journey to decarbonise the NHS is a comprehensive undertaking, involving strategic shifts across all aspects of its operations. A significant focus is on decarbonising estates, particularly heating and hot water systems, which account for a substantial portion of direct emissions. The mandate for all NHS Trusts to have Heat Decarbonisation Plans (HDPs) in place by March 2024 highlights the urgency and commitment driving the decarbonisation of the NHS.

Key aspects of the NHS decarbonisation strategy include: Transitioning from fossil fuels, by moving away, where possible, from gas-powered systems to low-carbon alternatives. This includes adopting renewable energy, such as installing on-site solar panels and exploring power purchase agreements for renewable electricity. Efforts to improve overall energy efficiency will not only include upgrading heating, but also address lighting, ventilation systems, and enhancing building fabric with better insulation. To achieve this, the NHS intends to better leverage funding, utilising schemes like the Public Sector Decarbonisation Scheme (PSDS) to finance energy-efficient upgrades.

The Hot Water Challenge in Healthcare: Reliability Meets Sustainability

Healthcare facilities, especially hospitals, have unique and demanding requirements for hot water. The guaranteed provision of safe and appropriately heated water is not just a convenience; it is a fundamental necessity for patient care, hygiene, and critical sterilisation processes. Historically, steam and gas-fired systems have been prevalent due to their high output capacity and perceived reliability. However, these systems are significant contributors to carbon emissions, making them incompatible with the long-term plans for the decarbonisation of the NHS.

While direct electric water heaters offer zero on-site emissions, their higher running costs can be a concern for large, continuously operating facilities. The challenge lies in finding responses that balance environmental responsibility with economic capability and, crucially, uninterrupted operational reliability.

Delivering Sustainable Hot Water Solutions for Healthcare

As experts in commercial hot water and heating systems, we are uniquely positioned to support trusts in achieving the decarbonisation of the NHS. Our approach focuses on providing balanced and strategic hot water systems that integrate low-carbon technologies, ensuring both sustainability and operational resilience.

We advocate for hybrid hot water systems that combine the strengths of various technologies. Our award-winning FUSION system integrates a storage cylinder with an electric boiler and the option of an Air Source Heat Pump (ASHP). ASHPs are highly efficient, capable of generating up to 70% of the necessary system energy as preheat, thereby significantly offsetting the energy demands and emissions of the electric boiler.

The benefits of a hybrid approach when delivering domestic hot water (DHW) to healthcare facilities are well understood. Most notably, significant carbon reduction is easily achievable, supporting NHS Net Zero targets and driving the wider decarbonisation of the NHS. Buildings also gain assured reliability since hybrid systems offer built-in redundancy and the option of extra, temporary back-up in the form of additional electric immersion, ensuring a continuous supply of critical hot water, vital for healthcare settings. This approach also aligns healthcare estates with evolving environmental regulations and sustainability standards to offer a future-proof option that supports versatile and changing planning. Beyond packaged hybrid systems, Adveco provides expertise in designing and implementing entire bespoke low-carbon hot water systems, including thermal storage optimisation, meaning all DHW needs within buildings, whether new build or existing structures requiring retrofit, can leverage these technology advantages. In addition, technologies such as solar thermal offer a truly renewable and zero-emission source of hot water, capable of significantly offsetting a building's annual energy requirements for hot water. These systems are highly efficient, cost-effective, and require low maintenance, offering a rapid return on investment.

Partnering for a Healthier, Greener Future

The decarbonisation of the NHS estate is a complex but achievable goal. It requires a focused approach, moving beyond traditional solutions to embrace innovative, integrated systems. Adveco is committed to partnering with NHS Trusts, offering our expertise to design, supply, and support bespoke low-carbon hot water systems that meet the rigorous demands of healthcare environments. By working together, we can contribute to a healthier and more sustainable care system for generations to come.

Read The Complete UK Water Heating Report From Adveco

You can now read the complete Adveco report on water heating in the UK. We assess the impact from current to new technologies and regulations as the country seeks to transform how commercial buildings heat water in cost effective and more sustainable ways.

READ THE REPORT

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

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

FIND OUT MORE

ARDENT Electric Boiler

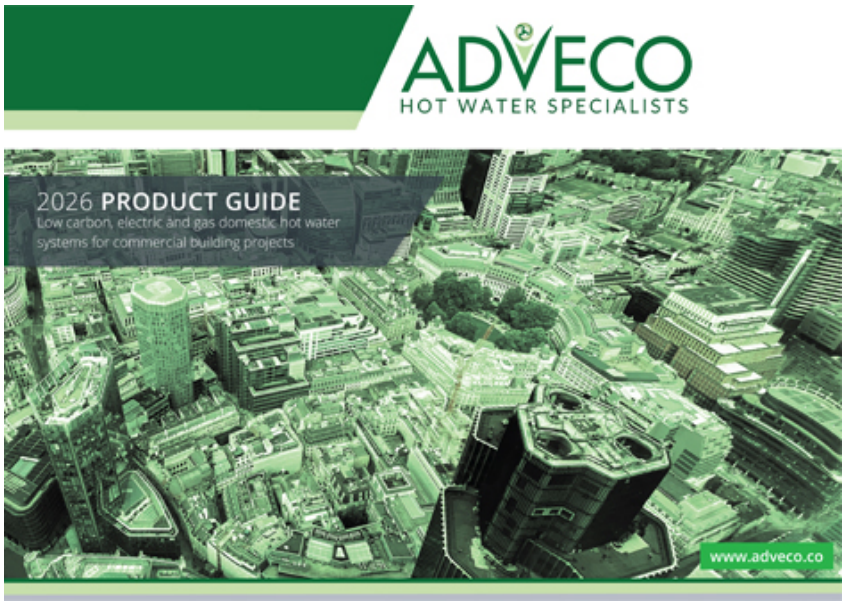
ARDENT is designed to serve as an indirect water heater or heating system. Wall-hung and floor-standing variants for those seeking to avoid a reliance on gas energy supplies. In hard water areas the ARDENT electric boiler can be used to dramatically reduce the costly build up of damaging limescale.

FIND OUT MORE

Adveco 2026 Product Guide

Get the latest guide to Adveco's expanding product range for 2026

2026 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
Offsite Constructed Packaged Plant Rooms

[Premium Chilled Water Systems]

01252 551540

Enquiries@adveco.co