Welcome to Adveco's November newsletter,

We are very excited to be able to share more details this month on the new partnership with Midea to provide air source heat pumps for DHW applications, increasing our turnaround times from order to dispatch as well as being able to leverage Midea's excellent after sales engineering support. Combined with Adveco's expertise in DHW application development, this partnership provides everything you could need for adoption of het pumps.

We also take a look at how the education sector can make best use of metering technology if it intends to move buildings off gas and onto electrical water heating. A process all most certainly going to incorporate heat pumps. Making the transition in a quick and cost effective manner can be a real challenge so we are here to explain best approaches to retrofit.

Finally, as we are keeping the focus on het pumps we take an opportunity to lay out some of the basic facts about heat pumps, before taking a deeper dive in to the pros and cons, especially when it comes to deploying ASHPs as pre-heat for hybrid DHW applications.

We will have more het pump news before the end of 2024, so please keep up with us, visit our blog and news pages on the website for more information or follow us on LinkedIn, Facebook or X for the very latest news.

Adveco & Midea Commercial Heat Pump Partnership

Adveco has announced a new manufacturing partnership with Midea Cooling & Heating (UK & Ireland) to provide commercial air source heat pumps (ASHP), after-sales technical support, maintenance and service

for commercial water heating applications.

The partnership further strengthens Midea's presence across the UK in the more complex commercial water heating space. Adveco will distribute 16-30 kW, three-phase Midea monobloc R32 heat pumps as part of its award-winning engineering design and system supply for water heating in new and refurbished commercial properties.

For the past five years, Adveco has been committed to the intensive development of applications which maximise the possibilities of heat pump technology for domestic hot water (DHW) in commercial environments. The complex and very specific demands of DHW for commercial buildings have highlighted the need for a hybrid approach that derives the maximum efficiency from the technology as a source of pre-heat, reducing carbon emissions, giving customers best value from capital investments and optimising future operational costs.

The partnership commences with the immediate launch of the ADV16W, ADV22W and ADV30W models, the range offers a complete, energy-efficient means to deliver domestic hot water year-round to the widest range of commercial spaces.
Responding to this new partnership, Steve Robinson, Director, Midea Cooling & Heating (UK & Ireland) commented, "Addressing reduction of carbon emissions from commercial and public sector buildings remains a key challenge in the UK. By partnering with Midea, Adveco is positioned to further drive innovation in low carbon water heating, leveraging our expertise in renewable technologies and leading range of heat pumps. We look forward to a long and successful partnership that contributes towards the UK's net zero goal."

Greg Brushett, Sales Director, Adveco said, "Midea is the perfect partner for developing commercial hot water applications with heat pumps. Its excellent range of R32 monobloc heat pumps meets all the technical criteria we require to fulfil often complex specifications. Our expertise in water heating design is then perfectly complemented by Midea's superior post-sale technical knowledge, service and maintenance functions. This means we can develop and supply the very best low-carbon hot water systems with assured longevity to carry building operations to 2050 and beyond.

The ADVW ASHP Range Key Features

- 16 kW to 30 kW in three-phase capacities,
- Domestic hot water provisioned up to 60°c
- A+++ ERP energy rating (ADV16W) / ADV22W)
- High SCOP with water outlet temperature 60°c / ambient air temperature 7 °c. ADV16W 3.41 / ADV22W 3.22 / ADV30W 3.14
- Maintains continuous domestic hot water supply up to 55°c even with outdoor temperatures as low as -25°c.
- Compact, pre-charged monobloc design for easy installation, especially when space is limited
- Quiet operation as low as 35d db(a) sound pressure level at three meters
- Energy consumption monitoring as standard for running cost analysis.
- Intuitive control for managing water production temperature and operating modes.

DISCOVER THE ADV-W ASHP FROM ADVECO

Metering Schools Hot Water For Gas To Electric Transition

Adveco considers the numerous advantages of metering school hot water demands before embarking on a major refurbishment of buildings to deliver improved sustainability...

Water heating will account for a significant portion of a building's energy consumption, ranging from 15-40% depending on its use. This makes hot water both familiar and often business-critical, so reducing hot water demand and implementing efficient heating methods translates to substantial energy savings and emission reductions that have recognisable advantages to its users across the education estate.

The most consistent issue we see in school hot water systems is oversizing, whether through a lack of understanding of application design or concerns over providing suitable backup to ensure system continuity. The result of oversizing is however always the same, unnecessary capital costs for system supply, installation and ongoing excess operational costs associated with higher energy demands and therefore greater carbon emissions.

As schools plan to adopt greener building operations, replacing old gas-fired systems with like-for-like electric is another guaranteed way to gain an oversized system, but can also lead to under-sizing if storage is not large enough to account for low, slow heating associated with heat pump based electric systems.

Getting that balance right is critical as per kW price of electricity remains much higher than that of gas. Plus, if not optimised, the system will generate excess capital costs in terms of size and number of water heating appliances and complexity of installation. That in turn can also become more time-consuming and disruptive, a cause for concern if refurbishment work is scheduled into the narrow window afforded by the school holidays. More importantly, if the new electric system is oversized the required amperage could exceed a building's available electrical supply. Bringing in new supply means excavating, possibly as far as the substation, which will see costs soar, or even stall the project.

This can best be avoided by collecting live onsite data. Metering school hot water becomes a valuable, non-invasive, and low-cost exercise, undertaken to assess actual usage, including time and duration of peak demands which is critical for correct sizing. When assessing a school's domestic hot water (DHW) usage, it is important to also establish basic information on energy sources, be they gas or electric, planned use of

renewables such as Heat Pumps or Solar Thermal and the level of system redundancy and backup. This helps steer the design of the replacement system.

Adveco provides a comprehensive service for Metering school hot water for every small investment, creating an accurate, cost-effective system design that can deliver carbon reductions and meet all your building's hot water demands. This provides the data you need to evaluate any upgrade and a benchmark against which to explore various alternatives such as high-efficiency gas or electric boilers, heat pumps, and solar thermal systems, which can be deployed in isolation or as hybrid systems. It also enables consideration of other factors like budget, space constraints, and fuel availability, which all factor into launching a sustainable strategy for a building.

Metering school hot water usage is a first step which not only gives you access to expert guidance from qualified professionals but can also help secure the necessary support from within the organisation to push for government grants.

This is key because a well-designed low-carbon electric system still has several cost implications. Correct sizing with metered data can reduce the costs of purchasing and installing new hardware, potentially saving tens of thousands of pounds depending on the scale and complexity of the DHW application. Recognising a need for lower-cost electric systems, Adveco has developed the award-winning FUSION Range, combining an electric boiler, a specially designed cylinder and pipework that is fast to install and resilient to operate. Iterations with a monobloc air source heat pump deliver a reduction of up to 71% in carbon emissions over equivalent gas-fired systems. These smaller systems help avoid the need for increased electrical supply and excavation works that can run into hundreds of thousands of pounds! Despite this, operational costs do climb and will continue to do so while grid electric prices remain much higher than those of gas grid supplies.

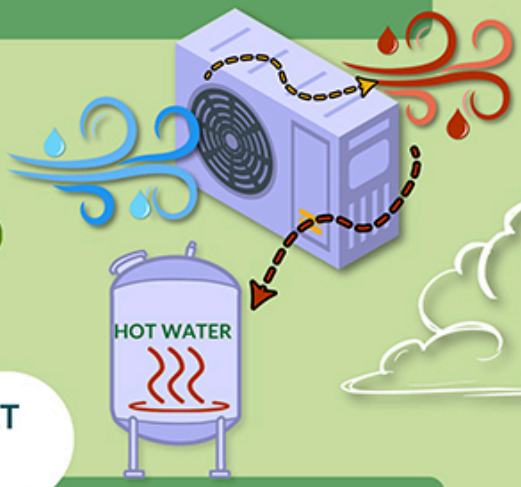
The application of renewables can go a long way towards solving this, despite extra system complexity and upfront capital investment. A balanced use of renewables, whether heat pump, solar thermal or a combination of the two can offset much of the grid energy demand needed to safely operate high-temperature water systems demanded by school buildings. Adding solar thermal to a system is a proven method for offsetting as much as 30% of the annual energy needed for heating or cooling water in building systems, thereby actively cutting operational costs. It also readily lends itself to school buildings which have large, often underused roof spaces that could easily accommodate the technology.

The advantages of metering school hot water are clearly defined in the reduction of carbon emissions, and, as work continues to decarbonise the electricity grid, the emission reduction figures supplied by the new hybrid system design should improve considerably, adding further environmental value to the system over the course of its operational lifespan.

AIR SOURCE HEAT PUMPS

1 AIR SOURCE HEAT PUMPS (ASHP)

Low-carbon technology transfers air heat to preheat domestic hot water (DHW) in commercial buildings.



2 MEASURING THE HEAT PUMP EFFICIENCY

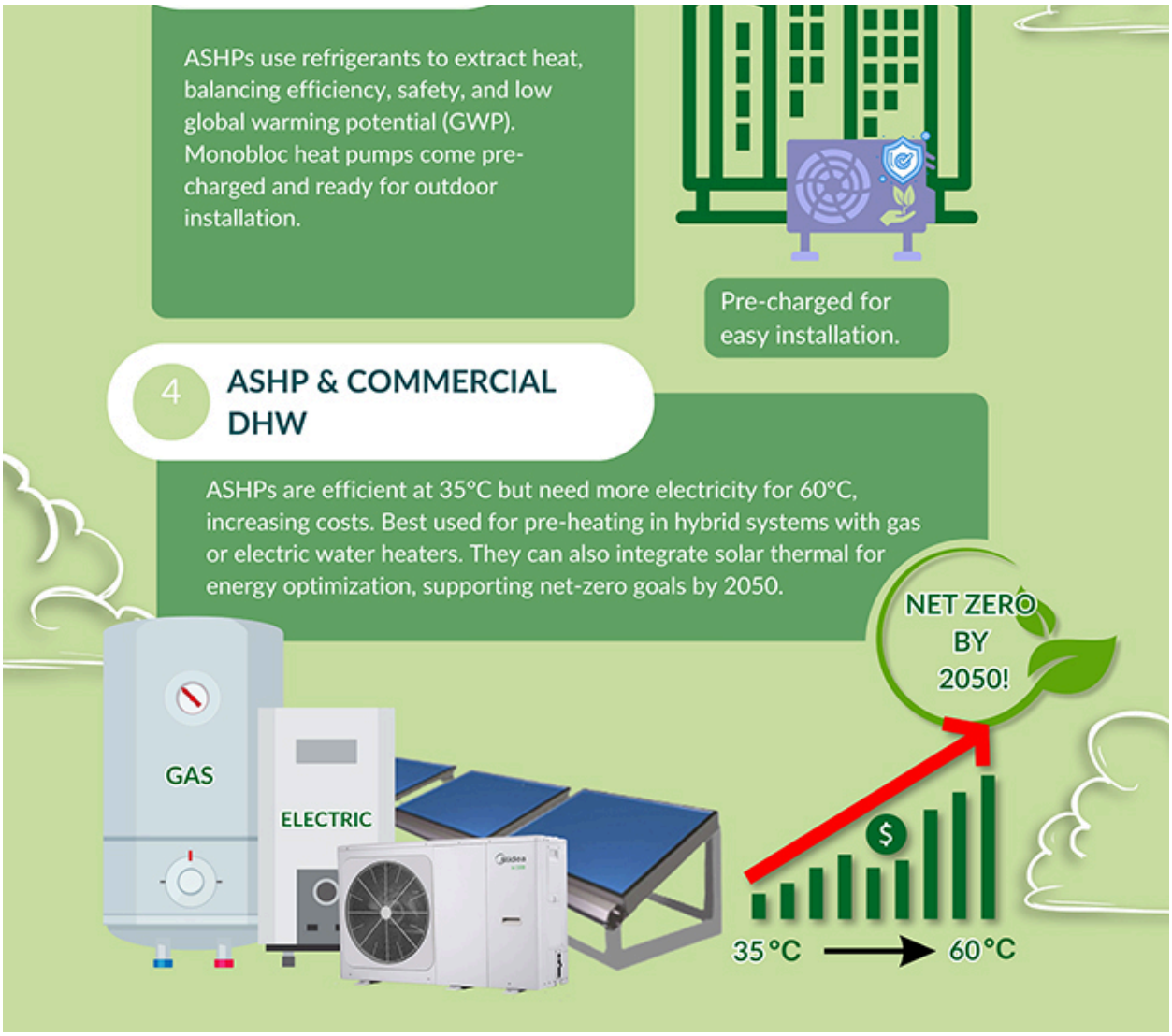
Efficiency varies yearly with ambient temperatures. ASHPs absorb heat in the air, reducing grid electricity use and reducing carbon emissions

Seasonal Coefficient of Performance (SCOP)

Thermal Energy Transferred **VS** Electrical Energy Consumed

= Coefficient of Performance (COP)

3 REFRIGERANTS



With growing concerns over sustainability and energy efficiency, commercial buildings are increasingly looking for alternatives to traditional gas water heating. Air source heat pumps (ASHPs) have emerged as a promising option, offering potential benefits in terms of reduced carbon footprint, and improved reliability. However, like any technology, ASHPs come with limitations that need careful consideration before implementation in a commercial setting. Adveco considers the key advantages and limitations of ASHPs for hot water provision in commercial environments, aiming to provide a balanced perspective for informed decision-making.

Heat pumps for hot water generation, such as Adveco's ADV-W, FPI-32 or L70, work by extracting heat from the ambient air, utilising electricity to power the process. Compared to conventional electric resistance heaters, ASHPs can achieve significantly higher Coefficient of Performance (COP) values, translating to 3-4 times more energy output for every unit of energy input. This energy efficiency enables the ASHP to deliver equivalent heating for less input, and, since the unit utilises a renewable energy source – ambient air – carbon reductions are either minimised, or there may be no direct emissions during operation at all. This makes ASHPs an attractive option for businesses aiming to reduce their carbon footprint and align with sustainability goals.

The efficiency of ASHPs will decline as ambient air temperatures drop. The UK has a relatively mild climate, even winter extremes are unlike to prevent operation as most ASHPs will operate as low as -25°C. The efficiency will fall though as the unit works harder to achieve the typically cited 30°C working flows required

for domestic operation. In extreme cold then, supplemental heating sources would be needed to maintain desired hot water temperatures.

This is true of commercial applications in typical operation as the need for higher temperature working flow is a major safety requirement. To raise temperatures to the necessary 55-60°C means working the ASHP much harder as overall efficiency drops off at higher temperatures. Working the ASHP harder consumes more electric energy, which in turn negatively impacts operating costs. Although more efficient than resistance heaters, ASHPs still rely on electricity to operate. Fluctuations in electricity prices or grid unreliability can affect operational costs and system performance. For those transitioning from gas-fired water heating to ASHP driven systems, failure to factor in the difference in cost between currently cheaper grid gas versus electricity (as much as 3.5 – 4 times the cost) can become a major operational issue.

For this reason, an ASHP is rarely the single response for commercial scenarios with very high hot water demand applications such as restaurants, hotels, schools, universities, care homes, hospitals or industrial facilities. Large and/or higher temperature ASHPs are available yet may still not be suitable for all commercial applications. Their cost may be prohibitive and, depending on the size and capacity, ASHPs might require dedicated space for installation, which could be a limitation in buildings with reduced space availability. As with any hot water application, actual usage data, especially peak demand, is critical for accurate sizing and a good way to gauge if an ASHP is the correct response for the building in question. In most cases hybrid systems combining ASHPs with preferably electric boilers, such as the ADVECO FUSION boiler systems, but also gas, as well as solar thermal as a source of mid-heating is going to be the preferred way forward. ASHPs are available in a wide range of sizes and configurations, allowing for flexible implementation in buildings of various sizes and hot water demands. Using the hybrid model, the ASHP is deployed to maximise the seasonal COP (SCOP) operating consistently at the greatest efficiency year-round to raise the water temperature to between 40-45°C. This is then passed into the system for topping up to the required 60°C minimum system temperature, by either the boiler or solar thermal and boiler combination. The ability to manage consistency of flow temperature, even when ambient temperatures drop, without driving the heat pump too hard is truly advantageous. Combined with a grid-connected boiler, such as Adveco's ARDENT, delivers a robust all-electric, lower-carbon applications that will meet and exceed most current building regulations. Increasing the number of ASHPs is also a relatively simple option, so long as the building has enough connected amperage to support installation, meaning adjusting capacity needs as circumstances change is still relatively straightforward.

The initial purchase and installation cost of heat pumps for hot water can be higher compared to conventional systems. This can be a barrier for businesses with limited upfront capital, so it is worth investigating financial incentives on offer from the government to encourage the adoption of renewable energy technologies. In the UK small businesses currently have access to the same funding support and consumers seeking to replace existing gas boilers with an ASHP. However, for the time being, most commercial organisations will need to factor in the additional costs associated with purchasing units. Commercial-scale water heating is inherently more complex and therefore more costly to initially invest it, but ASHPs are relatively quick and simple to install. Once in place, when compared to gas boilers or other fossil fuel-based systems, ASHPs have fewer moving parts and require less frequent maintenance. A system

based around an ASHP will therefore expect to demonstrate lower service costs and increased uptime for hot water delivery.

While ASHPs offer numerous advantages in terms of energy efficiency, environmental impact, and potentially long-term cost savings, their limitations need to be carefully assessed. Conducting a thorough feasibility study, considering specific operational parameters and available government incentives, is crucial before making a decision. By balancing the advantages and limitations of ASHPs against the specific needs of your commercial facility, you can determine if this technology represents the most sustainable and cost-effective solution for your hot water requirements.

Choosing the correct hot water heating application for a commercial environment requires careful consideration of various factors, including building type, hot water demand, climate, budget, and sustainability goals. Proper design, installation, and maintenance are crucial when optimising ASHP performance and maximising its benefits. Adveco, with more than 50 years of hot water design expertise, is here to help with consultation and can advise if ASHP technology or a hybrid mix of renewable technologies is the best resolution for your building project. Adveco's temporary metering service and system sizing can also help create a more accurate financial analysis for the lifecycle costs of ASHPs compared to any existing and other alternative technology, including upfront costs, operating expenses, and maintenance requirements. This can provide valuable insights for decision-making whilst organisations wait for further potential government incentives to come into force.

By carefully considering all factors and conducting a thorough assessment, businesses can leverage the advantages of heat pumps for hot water needs while mitigating potential limitations, contributing to a more sustainable and cost-effective future.

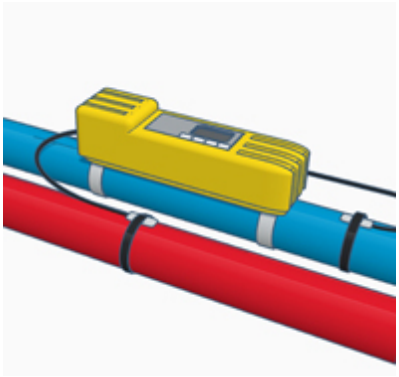
LEARN MORE AIR SOURCE HEAT PUMPS FOR WATER HEATING

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



Live Metering

Data gathering, sizing and bespoke system recommendation for commercial properties intending to replace legacy gas systems.
Live Metering supplies business-critical information to create more sustainable applications that are optimised to meet all hot water storage and delivery demands.

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 2024 Product Guide

Get our handy reference guide to Adveco's current product portfolio. Updates include the new ADV-W ASHP range...

2024 PRODUCT GUIDE

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

Live Metering
Solar Thermal Systems
FPi R32 monobloc Air Source Heat Pump
L70 Air Source Heat Pumps for larger projects
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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