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PLASTIC PIPES: SUPPORTING FUTURE DEVELOPMENTS IN LOW CARBON HEATING APPROACHES

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There are many current challenges for the heating and ventilation sector, but plastic pipes are increasingly helping to provide efficient and low carbon solutions across newer and emerging technologies.

With the introduction of the Future Homes Standard in 2025 banning new gas boiler installations and rising energy bills hitting both households and business, how we heat our buildings is becoming a key topic in the construction industry. There are three main options, heat pumps and district heating which are already being used today, and hydrogen, which is a longer-term potential solution.

If we look at some of these technologies, district heating is growing in popularity due to the economies of scale using a central low heat source to distribute heat via underground pre-insulated pipes to end users. Polymer pipes are ideal for modern low flow temperature systems of 50-70°C, compared to older systems of 80-95°C that often use steel pipes. The benefits of polymer pipes include high corrosion resistance, faster installation with less welding and long, flexible pipe coils. No expansion bends are required as polymer does not expand with as much force, and it self-compensates in the ground. Carbon emissions for freight are also

lower with polymer pipes when compared to transporting traditional steel pipework.

Many existing district heating networks use gas or gas CHP as the heat source, but most new schemes now use large centralised heat pumps or waste heat sources. However, other sources such as deep geothermal, solar thermal or anaerobic digestion can be used. District heating is a rapidly growing area where polymer pipes are being widely deployed and is likely to increase as we look for alternative ways of reducing dependence on fossil fuels.

Other facts to note include the Green Heat Network Fund (GHNF), which is a key part of Government plans to reduce carbon emissions from heating homes and businesses by 2050. The GHNF is a three-year, £288 million capital grant fund to support the construction of new low zero and zero carbon heating and cooling networks plus the retrofitting and expansion of existing heat networks.

There are also heat pumps. Widely popular in Europe, but newer to the UK, these comprise three main types – ground, air and water. Air source heat pumps are the most common as the capital costs are typically lower. Heat pumps are mainly installed on an individual house or building level, but can also be used as the heat source for a district heating scheme. The Government wants 600,000 heat pumps installed by 2028 and there are schemes out there to encourage take-up, such as the Boiler Upgrade Scheme (although awareness seems to be low for this), with Government grants of £5,000-6,000 available to install heat pumps across England and Wales.

That being said, training engineers to install these new heat pumps is an area that also needs addressing. A recent survey by City Plumbing/Censuswide showed that only 18 per cent of the UK's plumbers are currently installing heat pumps and of these, only six per cent are Microgeneration Certification Scheme (MCS) certified. It also said 44 per cent of plumbers didn't know where to go for training on heat

pumps, and only 27 per cent said it was easy to find a course near to where they lived.

Other challenges include the higher capital costs of heat pumps against traditional gas boilers (leading to reluctance to change by householders) and fluctuating energy costs. On the positive side, the survey said that customer interest in heat pumps is increasing and that 42 per cent of those plumbers surveyed expect energy efficient heating to boom by 2025.

Although these newer technologies include heat pumps and district heating networks, there is also the development of distributing hydrogen blended gas through the existing UK gas pipe network. As 90 per cent of this network already comprises polyethylene (PE) pipes, these would make ideal distribution vehicles, since hydrogen blends – as advised by the Office of Energy Efficiency and Renewable Technology – should not be carried through traditional metal gas pipelines.

If we look at the gas network, the pipe distribution network may already be there, but most boilers inside people's homes will need to be replaced by hydrogen-ready versions, and the actual method of hydrogen production is currently quite expensive as green hydrogen requires electrolysis using renewable energy in order to make it zero carbon. The UK government will review hydrogen's role in heating homes in 2026.

With all low carbon heat sources, it is more important to distribute the heat inside the building in an efficient way. Underfloor heating (UFH) has proved itself over many years, where polymer pipes are always used for water-based systems due to their high flexibility. Underfloor heating actually makes an ideal match when combined with heat pumps to increase efficiency and reduce carbon footprint, due to the lower flow temperatures needed versus radiator systems.

So, while heating engineers may be using more polymer pipes, the other challenges of converting homes to newer technologies remain and will continue to test the UK's ability to move rapidly towards a zero-carbon economy.

The recently formed Future Industry Group, part of the BPF Pipes Group, has been discussing many of these topics and is looking at how plastic pipes can contribute to sustainability and lower carbon emissions.