



Energy Efficiency of Communal Heat Networks

NICK MAHONEY, TECHNICAL SALES MANAGER, EVINOX

Nick Mahoney breaks down how the true potential of Communal Heat Networks can be unlocked to provide cost-effective heating

In the UK, current figures suggest that there are at least 18,000 heat networks delivering heat to around 500,000 customers. In theory, heat networks are indeed an efficient way of delivering heat and comfort to the end user. As such, the UK Government is exploring ways heat networks can help deliver the UK’s “net zero” target. The future for heat networks, then, surely looks bright.

At Evinox Energy, we have been involved in the heat network industry since 2007 where we have interacted with hundreds of heat networks over the years. We have witnessed the technology evolve from mechanical HIUs with “trickle” bypasses, to today, where we see electronic HIUs offering remote surveillance and diagnostic capabilities. Of equal importance, however, we have seen

those working in the industry and their attitudes evolve as well. In the early years of heat networks in the UK, there was a strong bias towards delivery performance resulting in oversized designs across the board. From needlessly large boilers to enormous plate heat exchangers in HIUs serving one-bedroom apartments. Today, and rightly so, efficiency is king. The all-well-known words “return temperatures” can invoke a nervous response from even the most stringent HIU manufacturer.

To most of the general population the words “return temperatures” are likely meaningless. To explain, it is referring to the temperature of the water returning from the heat network back to a development’s Energy Centre. In a typical Energy Centre, there will likely be several condensing boilers used to supply

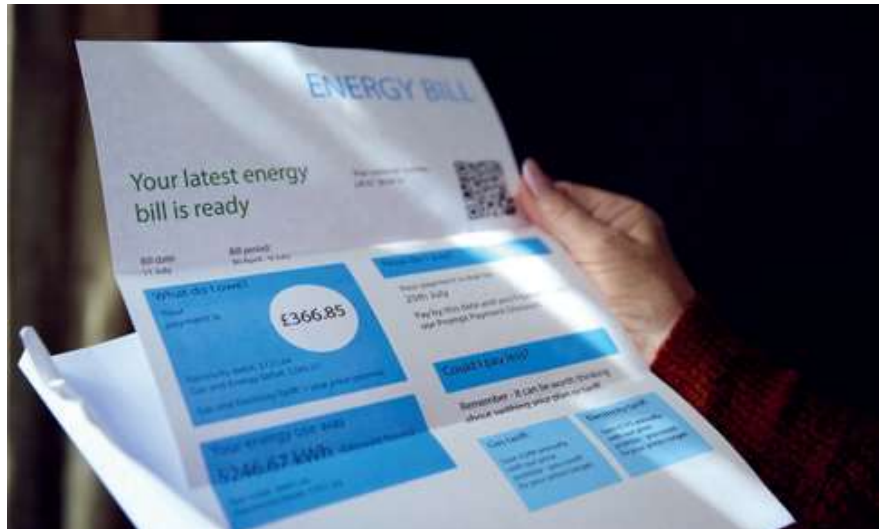
heat to the building’s heat network. The number of boilers depends entirely on the size and number of properties that the Energy Centre is supplying heat to. A condensing boiler creates gas from the fuel it is burning. This gas has potential heat energy. These gases are collected and recycled back into the system through a heat exchanger. This means that less gas as a fuel is required to heat the water within the heat network resulting in less fuel being required by the boilers, resulting in a much more efficiently run network. There is a key requirement for the boilers to enter condensing mode which is that the return temperature of the heat network is below a certain temperature, usually 55 degrees Celsius and under.

Unfortunately, we are rarely seeing this key temperature being met, and



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importantly, where it is not being met, residents of developments across the country will secondhandedly be paying for the boilers in their energy centre to use more fuel than they were designed to. Our figures suggest that most heat networks are operating at an efficiency of 30% or less. This means that just 30% of the heat being generated by the Energy Centres boilers is reaching residents and the remaining 70% is quite literally disappearing into thin air. There has never been a more critical time in the energy industry for direct action to be taken on misbehaving heat networks. With gas prices soaring combined with a cost-of-living crisis, the need for those with the tools to help, need to be educated and be made aware of this very pressing issue.

One course of action which some operators are taking, flagged to us on social media, is councils turning off their communal systems at certain times to reduce operating costs. This of course means that thousands of residents are

left without heating and hot water at certain times of the day. This is particularly worrisome as we are now entering the winter months. From our experience, where new Heat Networks are being installed, there is thankfully, a focus on energy efficiency and the key elements that contribute to this are gone over meticulously with a fine-tooth comb. Such elements could include making sure the pipework is sized correctly, that there aren't too many boilers to deliver the required heat and careful calculations worked out to ensure Plate Heat Exchangers are sized correctly for the apartments load.

A shift now needs to happen to apply the same attitudes to legacy heat networks whose residents will undoubtedly bear the brunt of inefficiency with their own money. At Evinox Energy we have carried out several site surveys of legacy networks to highlight their inefficiencies. Our engineers often find the same problems

whereby, as mentioned earlier, there is little in place to ensure that rather than running efficiently, the heat networks have been commissioned or setup in such a way that everything is running flat out with the likely thought that this will guarantee comfort for the end user. Performance and efficiency under no circumstances should be trade-offs from one another. Re-commissioning works such as setting Energy Centre boilers to cascade, allowing pump sets to modulate, ensuring buffer vessels are stratified are just a few of the advisories our team can make to get your heat network running more cost effectively for the gas bill payer and, most importantly, the development's residents.

Where new technologies enter the market, there is still the option to have old outdated HIUs retrofitted with new electronic valves and control strategies to keep them up to date. Rather than the whole HIU being replaced, the internals can be swapped out for bespoke kits to offer an old outdated HIU, the chance at a new lease of efficient life. This is also a highly cost-effective method of giving an entire development remote surveillance of their heat network to ensure that it is running as optimally and efficiently as possible. Where Evinox Energy, have installed their retrofit solution, efficiency levels of 75% and above are guaranteed. This practice ensures residents have full control of their energy usage and the peace of mind that their money isn't being wasted like heat in an inefficient heat network.



If you manage or even live in a development where your heat network is not delivering the heat you are paying for, then please get in touch with myself at nick@evinox.co.uk.