



Are you managing apartment blocks fitted with communal heating systems?

HELEN NÄSLUND, TECHNICAL SPECIFICATION MANAGER, EVINOX

Helen Näslund from Evinox breaks down how Heat Interface Units (HIUs) can help to improve block heating efficiency

If you are, are you worried about the rising cost of gas and electricity and its effect on your residents heating and hot water bills, particularly those residents suffering fuel poverty?

We all hear about the cost-of-living crisis and what is being done to tackle this. One initiative was the energy price cap introduced by Ofgem in January 2019 which sets a maximum rate the energy companies would be allowed to charge per kWh and cap the daily standing charge.

The measures Ofgem have introduced to protect consumers from rising energy prices show how important they think it is to protect us from this volatile energy market. But there is a flaw to this price cap in that it does not cover heat networks, so if you have an apartment block with a communal heat network or a building fed by a district heating network your residents are not protected and will be subject to commercial fluctuating pricing.

The implication of this is that the price of gas consumed to heat communal networks is likely to be well in excess of the Ofgem price cap, thus penalising residents. So with this in mind, what can you do to help protect your residents from a significant increase in the cost of heating their homes and generating hot water, preventing fuel poverty and providing an unnecessary struggle to pay their bills?

The first thing to look at is the cost of gas and electricity being charged to run the communal system and to look for more competitive offers.

Equally important is the efficiency of the heat network. If the boiler, or other equipment in the plant room, is running inefficiently or the distribution heat losses in the primary pipe network are high, this will directly affect the tariff being charged to residents.

Table 1, below, illustrates how the efficiency of the boiler and losses from

the distribution network affect the cost of running it, with the resulting heat unit rate (tariff) which the resident ends up paying for their heat. All three networks above are delivering 1,000,000 kWh of heat to the residents, but Network 3 would use 2,507,402 kWh worth of gas to do this, whilst Network 1 only uses 1,384,000 kWh worth of gas.

Network 1 is an example of a relatively good communal heating system where the boiler is running at an 85% efficiency with 15% heat losses from the distribution pipework. The gas consumed equates to £55,363.32 which is the sum used to calculate the unit rate for the residents, so this cost is divided by 1,000,000 kWh giving us a unit rate of 6 pence per kWh.

Network 3 is an example of a poorly performing heat network, however not an unusual example. For this network, the total cost of the gas is £103,896.10, giving us an equivalent unit rate of 10 pence per kWh, a 66% increase in the rate!

GAS BOILER NETWORK

	Network 1	Network 2	Network 3
Boiler gas consumption (kWh)	1,384,083	1,785,714	2,597,402
Total carbon emissions (tonne)	291	375	545
Boiler efficiency	85%	80%	70%
Distribution heat losses	15%	30%	45%
Heat delivered to customer (kWh)	1,000,000	1,000,000	1,000,000
Gas unit rate (£/kWh)	£ 0.04	£ 0.04	£ 0.04
Total gas cost (£)	£ 55,363.32	£ 71,428.57	£ 103,896.10
Resulting heat unit rate (£/kWh)	£ 0.06	£ 0.07	£ 0.10

Gas = 210 grams CO2/kWh

Table 1: The effect of boiler efficiency and distribution losses on cost

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You can easily check the efficiency of your communal heating system by getting the gas bill (or electricity bill if the system is fed by a heat pump) for a set period, look at the kWh consumed by the boiler and compare this figure to the accumulative kWh delivered to all residents over the same time-period.

This enables you to see the total efficiency of the network, i.e., how much of the energy consumed by the boiler gets delivered to the consumers?

If you have a bulk meter attached to the primary pipework in the plant room, you can also see the amount of heated water which is sent into the system from the plantroom. From this you will be able to break down these energy losses by boiler efficiency losses and distribution heat losses.

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We have carried out analysis on several heat networks in the UK and the most common reasons for inefficiencies are:

- **Boiler not condensing due to high return temperature from heat network**
- **Insufficient maintenance of plant room equipment**
- **Insufficient insulation on pipework and valves and thermal bridging through pipe clips**
- **Excessive primary network temperatures.**

- **Poor water quality damaging control valves allowing large volumes of water recirculate through the system unnecessarily.**
- **Poorly performing heat interface units in the apartments due to lack of maintenance.**
- **Poorly set up pipework systems.**

Most of these things can be rectified easily and relatively cheaply, rapidly saving your residents significant cost.

At Evinox Energy we have the added ability to connect to our heat interface units (HIU's) remotely, to extract real time data on their performance levels and see where there are opportunities for improvement. We can also change their operating parameters without having to attend sites to further enhance performance.

Unfortunately, not all HIU's operate in this way but there are still things which can and should be done to improve the system.

The government, through the Department for Business Energy & Industrial Strategy, is equally concerned about the efficiency of installed heat networks and as a result will be offering grants through the Heat Network Efficiency Scheme to fund improvements in communal system performance. The criteria and funding levels will be announced soon, but the scheme is not expected to start until 2023.

In the meantime, if you want to find out more about how to improve the efficiency of your communal heating system, please contact Helen on helen@evinox.co.uk.

