Taking control

Could modern heating controls be one of the keys to making existing multi-occupancy housing more energy efficient? Martyn Neil takes a look at the potential savings.

Improving the energy efficiency of the UK's social housing stock is key to tackling fuel poverty and achieving carbon reduction targets. However, finding cost-effective solutions to reduce energy usage, which in turn will help reduce heating bills for occupants, can present a financial challenge for local authorities and their housing partners.

According to the Government's 2015 Fuel Poverty Statistics Report there are around 1.4 to two million households in England that cannot afford to keep their homes adequately heated, which is the official definition of being in fuel poverty. Notably, the Report found that around one in 10 households in the social rented tenure category are fuel poor; while local authority homes and housing provided by Registered Social Landlords showed similar fuel poverty levels at 12% and 10% respectively.

The statistics also showed that dwelling age is closely related to both floor area and the energy efficiency of a dwelling. In other words, older properties tend to be larger and less energy efficient, making them more expensive to keep warm than newer properties.

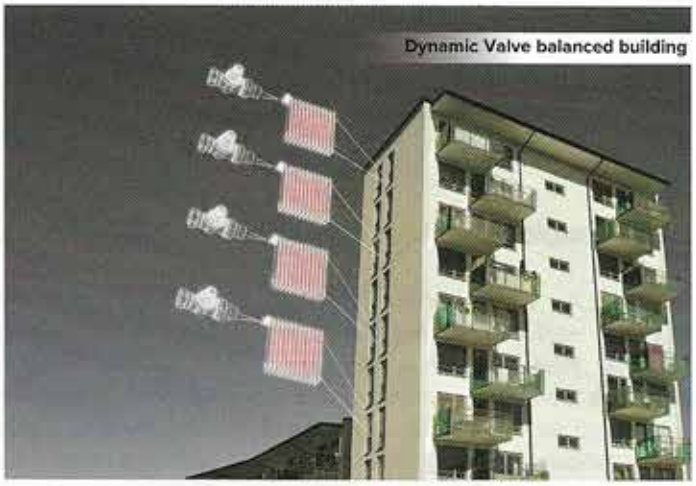
Decent Homes Standard

Whilst these figures may paint a rather bleak picture, it's not all bad news. As a result of the Decent Homes Standard introduced by the former Labour Government, significant improvements in energy efficiency have been made across the social housing spectrum. However, the findings of the 2015 Report indicate that fuel poverty is still a very serious issue for many households and further improvements are required to address this problem and to achieve the UK's climate change objectives. Indeed, the Report identified the need for a new Decent Homes Standard with a greater focus on energy efficiency to drive consistent performance across the social housing sector.

High-density living

A relatively high proportion of social housing, particularly in urban areas, is provided in multi-occupancy buildings. Improving the energy efficiency of this type of residential accommodation is, therefore, critical to achieving energy and carbon reduction targets. However, retrofitting energy saving measures in such properties can be difficult, particularly if multiple stakeholders are involved in the decision-making process. To assist these decision-makers Danfoss has been exploring the potential energy savings of three recognised methods for reducing energy usage in multi-occupancy buildings.

ASV balanced building



Dynamic Valve balanced building

The selected methods are: improving the heating controls in each dwelling, creating a hydronically balanced centralised boiler system, and installing individual energy meters. Data from leading industry sources was used to compare four key factors for each measure, namely, potential energy savings over systems without this measure, cost of investment, disruption to end users and payback period.

Energy saving statistics

Energy savings were achievable with all three measures as the following figures show:

- Energy metering: 20% energy savings over heating systems without sub-metering (Source: BRE).
- System balancing: 22% energy saving over heating systems without balancing (Source: average of six Danfoss case studies using methodology to determine energy used prior to installation and after, with corrected temperatures using the 'degree-day' method).
- Heating controls and radiator thermostats: 41% savings over heating systems with no controls. (Sources: Energy Savings Trust cost of £0.042 per kWh of gas and DECC average UK annual usage of 14,100kWh).

Heating controls

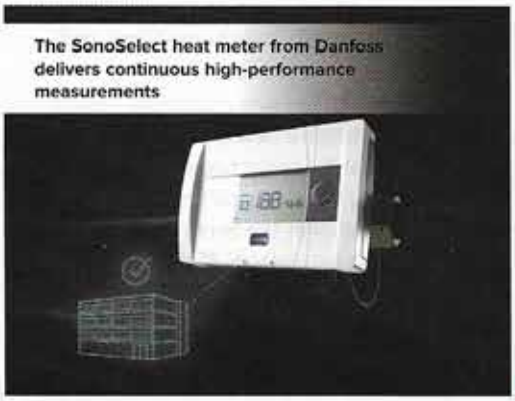
The three solutions can be used individually or all together to maximise HVAC system efficiency by ensuring optimal hydronic balance and perfect temperature control. For the purposes of this article, let's take a closer look at the statistics for heating controls. In addition to delivering high energy savings, heating controls have the advantage of a low investment cost. Typically, the cost of an electronic room thermostat and eight thermostatic radiator valves, including professional installation, is under £700.

The other benefits are minimal disruption to end users and a payback period of less than three years. The potential energy savings of this option are supported by tests conducted by BEAMA, a leading trade association, which is actively engaged with government and regulators on policy areas such as energy efficiency, building regulations and smart metering.

BEAMA's tests compared typical domestic energy cost over a 24-hour period. The results showed a benchmark cost of £5.31 (no controls), £4.68 (room thermostat only) and the maximum saving of 41% (room thermostat and thermostatic radiator valves — TRVs).

Specifying controls

Heating controls can be installed at any time but in multi-occupancy residential buildings they are more likely to be fitted as part of a general refurbishment that may include updating the boiler system to maximise energy performance. For optimum flexibility, a wide range of room thermostats and TRVs can be specified for use with all kinds of boiler system, from individual gas boilers and centralised boiler systems (with or without hydronic balancing) to district heat networks. Also, if required, programmable room thermostats are now available with a DHW channel for cylinder control.



The SonoSelect heat meter from Danfoss delivers continuous high-performance measurements

Cost-effective solution

It should, of course, be noted that the 2015 Report referred to in this article was published under David Cameron's premiership. Although we do not yet know if any of the report's recommendations will be adopted by the new Conservative administration, making millions of UK homes more energy-efficient must surely remain an objective for the Government at both a national and local level.

Whilst this can be achieved by various means, installing modern heating controls is well worth considering as one of the simplest and most cost-effective ways to reduce the carbon footprint of social housing stock and help tenants stay comfortably and affordably warm.

To view full Annual Fuel Poverty Statistics Report: 2015 go to: www.gov.uk/government/statistics/annual-fuel-poverty-statistics-report-2015

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