How and when are UK homes heated: from measurement to modelling

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Accurate representation of the patterns of heating in homes is crucial to making reliable predictions of energy demand using bottom-up stock models. The different ways people heat their homes has a marked impact on the distribution of the heating loads and the change in this distribution over time.

A number of monitoring studies have sought to infer heating patterns from measured internal temperatures. However, it is difficult to reliable characterise a heating pattern using this approach. A new large-scale study seeks to combine measured temperatures with heating system operation to provide a clearer picture.

From the existing studies, it is evident that heating patterns are very different from those assumed by the UK Standard Assessment Procedure (SAP). The measured temperatures are generally much lower, inter-room temperature differences are limited, the temporal patterns are diverse and correlated with the characteristics of the occupant, and any established pattern is often punctuated by periods of quite different behaviour. Recent work has proposed nine parameters, which together describe a heating pattern.

Reliable modelling is essential to evaluate policies and practices that are likely to changing heating behaviours. It is evident that a stochastic approach to housing stock modelling is needed to capturing the full diversity of real home heating patterns.