

## 16: Usability of domestic heating controls

### What are domestic heating controls?

Heating is responsible for nearly 60% of the energy consumption within our homes. Having control over a building's internal conditions can increase occupant satisfaction. Providing full control allows occupants to manage how much heat energy is delivered, where in the house it is delivered, and when.

A full set of heating controls within domestic buildings consist of a room thermostat, a central programmer and thermostatic radiator valves (TRVs). Currently, less than half (43%) of all centrally heating homes in the UK have all three components, and 6.6 million households could benefit from heating control upgrades. When programmed effectively controls can save substantial amounts of energy; reducing the temperature by 1°C can result in energy savings of 8%.

The programming of thermostats is a particular area of user frustration yet is often required to achieve energy savings. One study of twenty low-income homes in Wisconsin found that only 30% of thermostats were programmed, despite 85% of respondents reporting the programming features were used (Meier et al. 2011). During a usability study using digital programmable thermostat users experienced severe difficulties in programming the heating controls. These difficulties were most significant in the older user group (Combe et al. 2011). Hence, more usable and inclusive heating controls may achieve greater energy savings.

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### Key Issues

- Heating is the dominant source of CO<sub>2</sub> emissions from our homes
- Less than half of UK homes with central heating have a full set of full heating controls
- Digital programmable thermostats can save energy however prove extremely difficult to program, especially for older people
- If people were able to program their controls then significant energy savings may be made
- Heating is weather dependent and extremely cold winters have a significant effect on national CO<sub>2</sub> emissions

### Web Links

- [Heating Control Technology Guide, Carbon Trust CTG065](#)
- [Thermostats and Controls, Energy Savings Trust](#)
- [Taking control – a guide to buying or upgrading heating controls](#)
- [Journal paper \(Combe et. Al., 2012\)](#): An investigation into usability and exclusivity issues of digital programmable thermostats, *Engineering Design*, 23 (5), pp. 401-417
- [Journal paper \(Meier et. Al., 2011\)](#): Usability of residential thermostats: Preliminary investigations. *Building and Environment*, 46(10), pp. 1891-1898