Beama
Heating Controls

BEAMA White Paper

Heating controls can cut bills by 40%. So why aren't they in every home?

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Home heating accounts for 23% of UK energy demand and has increased by nearly a quarter since 1970[1], with over 95% of UK homes heated by a gas or oil boiler. If we are to meet our carbon targets it is essential that we do everything possible in the short to medium term to reduce wasted energy from these boilers, which we must remember are the biggest single energy consuming appliance within the home.

The Issues

Heating systems are not being controlled to deliver both comfort and efficiency. Without proper control they waste energy.

- **Householders want a warm, comfortable home.**
  Recent research[2] shows very clearly that everyone wants to be comfortable in their home, and warmth delivered by their heating system is central to this. Money savings are welcomed **only** if comfort is not compromised.
- **Around 11 million UK homes don't have suitable heating controls.**
  Research from 2008 showed that 70% of UK homes don't have the minimum level of controls defined within the Building Regulations for new systems[3]. Even allowing for heating improvements since the research took place it is likely that there remain 11 million homes with the potential for improved controls.
- **People tinker and play with their heating system to achieve comfort.**
  Heating systems without suitable controls cannot achieve desirable comfort levels. Most people appear to be using their systems in ways that achieve 'acceptable' comfort, but their system will not be operating in the most efficient manner. Where money is tight this inefficiency leads to comfort being compromised.
- **Current policies fail to promote opportunities to improve controls in UK homes.**
  The role of heating controls needs to be far more prominent within current policies to reduce energy use in UK homes, particularly to ensure that they are installed as a part of every retrofit.

The Solutions

- **The installation of a room thermostat and TRVs can reduce energy bills by over 40%.**
  Tests carried out at the University of Salford in their Energy House facility showed that the costs of running a heating system with a full set of temperature controls was 40% less that the same system operated with a timer only. The tests also showed that individual room temperature controls (TRVs) were necessary for the system to maintain balanced temperatures around the house.
- **Room thermostats & TRVs are readily available, familiar to installers and simple to install.**
  Increasing the rate at which these controls are installed could be accelerated with changes to policy. Both room thermostats and TRVs are a cost effective upgrade to existing homes with a payback of 18 months or less[4]. They can be supplied by UK manufacturers and existing local installers.

[1] DECC (2013). The Future of Heating: Meeting the challenge

[2] Fell D., King G. (2012). Domestic energy use study: to understand why comparable households use different amounts of energy A report to DECC.

[3] Research carried out by BEAMA with the Energy Saving Trust in 2008

[4] Payback estimates shown in appendix 1.

- **Better control systems will deliver comfort with lower fuel bills.**
  This message will be received more positively by householders, who research has shown can negatively interpret messages on reducing heating costs as a request to sacrifice comfort[5]. Also the savings will be permanent, unlike the short term saving from switching supplier.
- **Industry can promote the benefits of controls.**
  Heating controls have spent too long 'under the radar' of consumers. Industry must communicate the benefits of controls to generate demand from consumers, and we need to ensure that heating installers also act as advocates and deliverers of better controlled systems.

Changing Policy

Simple changes to existing policies could deliver saving to householders, whilst supporting carbon targets.

- **Building Regulations.**
  Part L of the Building Regulations in 2016 must make the installation of TRVs mandatory with a boiler replacement while a system is drained down, something that takes place in over 1 million households per year. Whilst TRVs are only 'good practice' before then industry must work to establish 'good practice' as the norm.
- **Green Deal.**
  Controls must play a more prominent role in the Green Deal and Energy Company Obligation. In particular, TRVs should be included in the measures eligible for financial incentives as this new research shows that they meet the 'Golden Rule.' DECC should also consider making a controls upgrade a requirement for all Green Deal installations. This would avoid situations such as where householders with insulation installed reporting that it was making rooms too warm so they had to open windows[6] – a reduction in expected savings that controls would have prevented.
- **DECC Heat Strategy:**
  'The Future of Heating: Meeting the challenge', March 2013 should be strengthened to specifically target the improvement of controls in homes so that all homes have a minimum standard.
- **Standard Assessment Procedure (SAP).**
  Increase the saving value ascribed to TRVs in the SAP methodology in light of this new evidence from the Salford University tests.

Only when we have a properly controlled heating system in place can **we help householders** to avoid wasting energy and to actually achieve both comfort and low energy bills.

The Benefits of heating controls: Improved comfort; increased efficiency

Over 50% of household energy is used for heating so significant benefits are possible:

- Householders can reduce their energy bills without compromising comfort.
- Those in fuel poverty or with fixed heating budgets can have more comfortable homes.
- Bringing all homes up to standards could save 5 $MtCO_2$ by 2020 – 12% of the total target in the DECC Energy Efficiency Strategy.
- Supporting UK manufacturing and supply chains will help deliver economic growth

[5] Decc heating research

[6] Fell D., King G. (2012). Domestic energy use study: to understand why comparable households use different amounts of energy A report to DECC.

APPENDIX – Test results from the University of Salford

The BEAMA heating controls group, TACMA, represents UK manufacturers of and suppliers of electrical and electronic controls and switches used in appliances, heating systems and general purpose applications. Its members are Danfoss, Honeywell, Horstmann, Invensys, Myson, Pegler Yorkshire, Siemens, and Sunvic. TACMA is dedicated to advancing heating controls for domestic installations to ensure a comfortable environment at the least cost.

The association commissioned the University of Salford to carry out some independent tests on the performance of heating controls in their Energy House facility. This facility consists of a full size house built within an environmental chamber, designed to assess the effectiveness of new and existing technologies in reducing energy use and waste.

The top line results from the tests are shown in the table below. We have also used these to estimate the potential annual savings, and therefore the cost effectiveness of installing heating controls where they are not currently present:

Test results		
Tests carried out	**24 hr heating cost[7]**	**Reduced cost from controls**
1 – No temperature control	£5.31	0%
2 – Control by room thermostat only	£4.68	12.0%
3 – Control by room thermostat + TRVs	£3.15	40.7%

Estimated cost effectiveness of controls[8]		
Type of upgrade	**Potential annual saving[9]**	**Estimated payback**
Install a room thermostat	£120.49	18 months
Install a room thermostat and TRVs	£409.86	15 months
Install TRVs to a system with an existing room thermostat	£289.37	14 months
Install TRVs when replacing boiler (in addition to a room thermostat)	£289.37	9 months

[7] Based on British Gas Clear & Simple cash / card payment (4.274p per kWh gas, 12.797p per kWh electric) not including standing charge (24.439per day gas, 15.979p per day electric) – Prices taken on 07/05/2013
from: http://www.britishgas.co.uk/products-and-services/gas-and-electricity/our-energy-tariffs/clear-and- simple/clear-and-simple-rates.html

[8] Based on savings in the test house and cost of measures if installed into a similar house.

[9] Figures are based on a heating season of 243 days, with 75% of the savings in March, April, November and 50% in October and September. Paybacks are calculated using installation costs calculated by TACMA for the Green deal call for evidence in March 2011. The measure 'TRVs at time of boiler replacement' assumes that the system is already drained down.

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