

1st November 2012



**Minutes of the Smart Heating Controls Workshop
Held 30th October 2012
at BIS Conference Centre, London**

Invitees to the Panel

Alan Aldridge	ESTA
Alan Christie	DECC
Alex Jones	Centrica
Anne Dye	RIBA
Brenda Boardman	Oxford
Brian Anderson	BRE
Cedric Sloan	FETA
Chris Tweed,	Cardiff University
Colin Calder	Passivsystems
Colin Chapman	AlertMe
Colin Timmins	Beama
Damon Hart-Davis	Exnet
David MacKay	DECC (Chair)
David Shipworth,	UCL
David Wagstaff	DCLG
Emma Owen	DECC
Enrico Costanza,	Southampton University
Jacquelyn Fox	CIBSE
Jeremy Watson	CLG
Katherine MacDivitt	DECC
Laura Haynes	Cabinet Office
Mark Crowther	Kiwa
Matt Lipson	DECC
Matthew Gordon	Honeywell
Paul DeCort	DCLG
Peter Boait,	De Montfort University
Robert Edwards	DECC
Ruth Rettie,	Kingston University
Tracy Bhamra	Loughborough University
Ian Llewellyn	DECC (Minutes)

Apologies

Abbas Elmualim	Reading University
Brenda Boardman	Oxford
Cedric Sloan	FETA
Colin Calder	Passivsystems
David Wagstaff	DCLG

Jacquelyn Fox
Katherine MacDivitt
Laura Haynes
Tracy Bhamra

CIBSE
DECC
Cabinet Office
Loughborough University

Introductions

The meeting commenced with a round table introduction of the workshop panel

The Chair then introduced the purpose of the meeting as:

- To gather ideas about what ideas are out there for the next generation of smart heating controls
- To learn about evidence about which types of controls are likely to be most effective
- To discuss whether an educator or 'district nurse' counselling of consumers would increase energy savings from smart heating controls
- To guide DECC on scoping a possible new research programme to investigate smart heating controls and how they could be optimised to save the maximum amount of energy

Presentations

Four presentations were given by members of the panel to start the discussion:

- Damon Hart Davis from Exnet gave a presentation on his experience of using various type of smart controls both in the home and in schools and subsequent consumer behaviour.
- Alex Jones from British Gas gave a presentation on their thinking behind the development of their smart heating controls and the added value to their customers of these products
- David Shipworth from the UCL Energy Institute presented recent research findings on the effectiveness of smart heating controls, the importance of the human/machine interface and on areas requiring further research
- Mark Crowther from Kiwa GASTEC presented their findings into the use of thermostatic heating controls, showing how consumers controlled their heating to reach their optimum comfort level and hence what will be required from smart controls to better this.

The main common points from the presentations were that consumers tended to value comfort over energy savings and that major savings in energy could be made by encouraging consumers to either reduce temperature levels globally or in zones that were lightly occupied.

To introduce the discussion, Matt Lipson then introduced DECC's thinking into gathering robust evidence on whether smarter heating controls save energy, including large scale randomised, controlled trials if appropriate.

Discussion and Brainstorming

The Chair introduced the topic as 'How can we get the evidence from a trial that can lead to smart heating controls in future being part of the Green Deal'. There were two aspects to this:

- What technology should be trialled and how?
- What should the design of the trial look like?

The Chair asked for ideas from the floor on both topics.

What technology should be trialled and how?

In the subsequent discussion, the following were considered:

- Trial a control with no temperature display, just a red button for extra temporary heating
- Soft zoning, with possible occupancy detectors. A problem with possible condensation was mentioned
- The 'District Nurse' approach to give consumers regular counselling in how to save energy. As this may be expensive, the industry members of the panel suggested also comparing a 'digital assistant'.
- Trial ways of visualising heat loss- i.e. in an easy to understand form
- Trial equipment with a self-learning ability to understand future occupancy levels and to control the heating accordingly
- Trial a simple on/off thermostat as a control
- Smart controls that either respond to a weather forecast or control based on external temperature (popular already in Germany)
- Optimum start/stop or delayed start/stop controls
- Controls for modulating boilers to allow greater efficiency
- Dynamic controls of set point depending on psychological factors that are known to affect people's response to heat. These could include lighting levels, CO2 levels, effect ventilation and humidity.
- A variety of types of home display
- Use of radiant heat to speed up heating of zones; e.g. in conservatories
- Learning controllers that have a model of the house heating response
- LED colour lights to make rooms appear warmer
- Smart controls that could nudge the user into changing behaviour
- Trials where the thermostat is optimally placed

What should the design of any trial look like?

David Shipworth from UCL introduced this topic with a brief presentation. He emphasised the importance of trial design in order to get consistency in the results and minimise uncertainties. Ideally trials would be standardised, and he compared the three phase clinical trials undertaken for new drugs against the many variable trials undertaken for this type of technology.

The meeting then discussed the following points:

- That data mining is ineffective in such trials as there are too many weakly related and co-linear variables It may be better to go from an initial phase (first look, small number of houses) to a second phase (detailed data) rather than attempt to test all technologies in one study
- In the first instance, qualitative results can be useful
- Should consider constant methodology for the trials
- Timing is critical in order to get the winter season
- To be of manageable size, the number of smart control features that should be tested in a large trial should be limited to 3

A discussion then considered what the top three smart control features would be. The top three were:

- Soft zoning
- District nurse concept of consumer assistance
- Intelligent controllers that could predict occupancy

Concluding Remarks

The Chair thanked the members of the workshop for attending and contributing to the discussion. DECC would now take the information developed during the workshop forward in producing its trial specifications.

Finally the Chair said that DECC was very keen to understand the capabilities of existing smart control equipment. He therefore asked that if any members had such information on smart heating control equipment, then he would like to receive details.

The meeting closed at 17:06.

I.P. Llewellyn

2nd November 2012