

Innovation Needs Assessment on Optimal Human-Machine Interfaces for the Residential Market



Project Acronym:	HMI INA
Project Details:	Optimal Human-Machine Interfaces for the Residential Market (HMI INA)
Start Date:	September 2013
Duration:	7 Months
End Date:	April 2014



Project Description

The project team aimed to examine the area of human behaviour as it relates to energy management. The work has been done in the form of an Innovation Needs Assessment (INA) study for the IERC. This INA focussed on determining the neurological "triggers" for optimal behaviour modification relating to energy use and energy management initiatives. The scope of the work was looking at the foundational aspects of Human Machine Interfaces and their application to the residential market. In the residential setting it has long been recognised that understanding what drives energy consumers and how to influence those consumers' behaviours with appropriate and sustainable human-machine interactions is key to affecting and maintaining behaviour change.

This short research study involved monitoring subjects using electroencephalogram (EEG) and other physiological sensors in a laboratory setting while they were presented with a series of visual choice sets specifically designed to replicate the social contexts for energy usage decisions at home. Individuals' responses to these choice sets were correlated with neurological feedback to identify trends and patterns. Two approaches to behavioural modelling were used. These were:

1. Implicit Association Task (IAT) – a measure designed to detect the strength of a person's automatic association between mental representations of words or concepts held in a person's memory.
2. Choice Preference Task an approach to get subjects to consciously decide, based on information presented, on whether they would stay at their current comfort level, or would want to change?

Project Achievements & Impacts

The short project gave pointers to key influencers of human behaviour concerning energy. These are summarised as follows:

1. Financial reward is ranked as the highest nudge factors; peer feedback is ranked lowest.
2. Framing home heating savings decisions in positive terms (e.g. gains or rewards) significantly nudges participants to make an energy-efficient decision and is more effective than if it was framed negatively (i.e. explaining the lost savings).
3. The likelihood of making an energy efficient decision is greater when asked to consider effects on the environment. In contrast, one is less likely to make an energy efficient decision when provided with peer feedback.

The work has been completed and a final report has highlighting areas for innovation opportunity.

Participating Research Organisations

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