Household Energy Use in the UK

- Buildings consume 20%-40% of total energy.
- Energy consumption results from both technological and behavioural causes.
- UK households are due to be fitted with smart meters by 2019.
- Part of this will be the ‘In Home Display’ (IHD) to give occupants feedback on energy use.
- There is potential for such displays to deliver feedback about the occupants’ own energy use compared to that of others, for example the average of their local neighbourhood or district.

Energy Consumption Distributions

The total consumption in each band is given by multiplying usage $u$ (KWh/d) by number of users $F(u)$ in that usage bracket. $G(u) = uF(u)$

The total for all users up to each band is the cumulative sum to this value: $T(x) = \sum_{u \leq x} uF(u)$

Conclusions

- Data shows that higher-than-average users both (a) contribute disproportionately to energy use and (b) respond differently to feedback and intervention campaigns.
- We have analysed models taking these effects into account to look at the best strategies for introducing peer feedback to energy consumption.
- The results show that effort must be made to influence the high-end users and that the type of display is important in achieving the best result possible.
- The choice of information (mean average or peak) is important for achieving better results.

Energy Behaviour

Adoption of energy-efficient technology/practices are based on a combination of factors [2, 3]:
- a) rational choices based on perceived intrinsic benefit;
- b) social diffusion of idea influenced by inter-personal communication (social capital);
- c) interaction with the “mainstream” via observation, media, IHD feedback.

Responding to Different Feedback

- Different types of visual displays can be used.
- feed-back information about own-use as well as peer comparison.

Modelling Asymmetric Responses

Figure 5: Modelling of effect 1. (above) showing the improved average.

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References