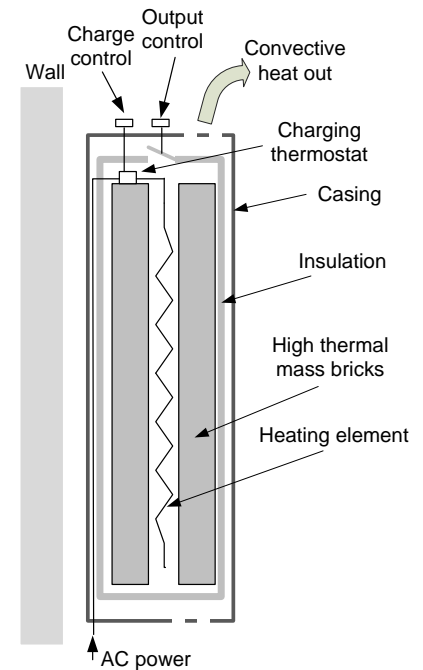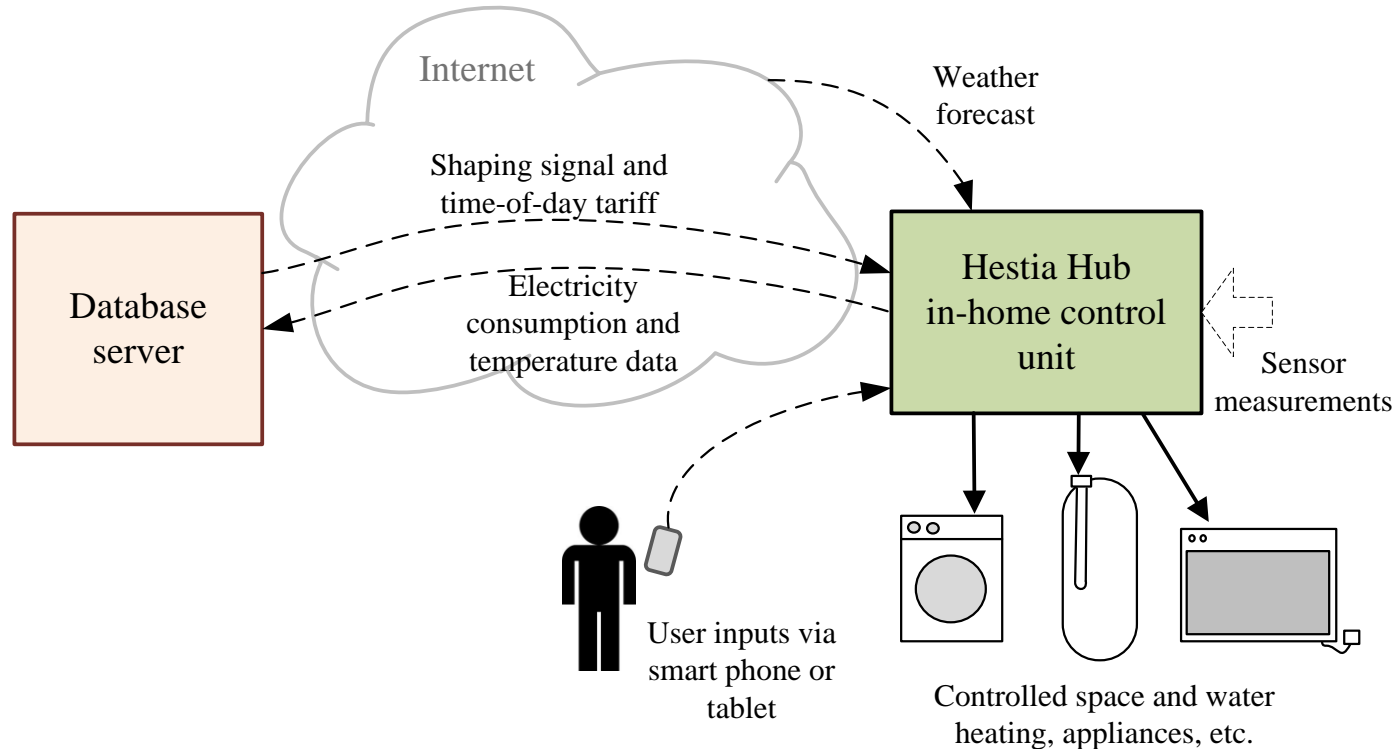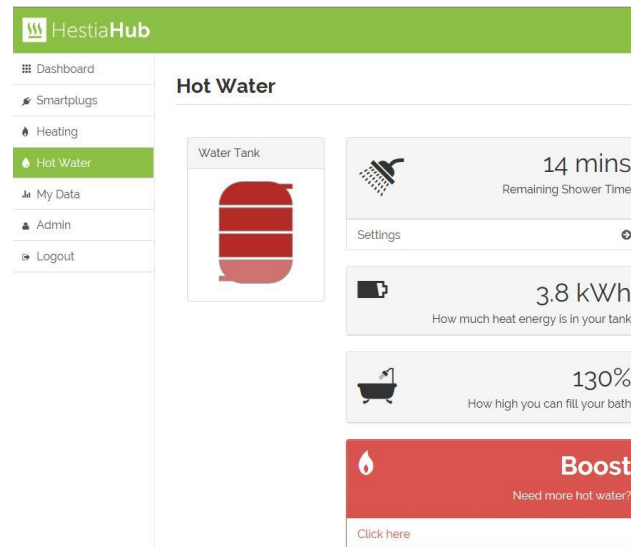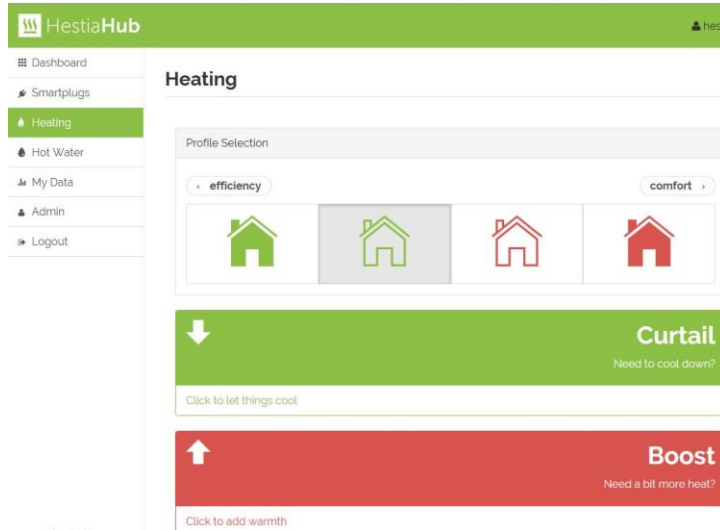# Smart control of storage heaters and water heating for SWELL

Dr Peter Boait

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- Funded by Innovate UK Localised Energy Systems competition
- Deployed Hestia heating and electricity demand controls in 48 homes in an Oxfordshire village during 2015.
- Demonstrated shaping of electricity demand for cost- and energy-efficient use of local generation from community PV and time-of-day electricity tariffs

Hestia Hub user interface

- Provides intuitive control of storage heaters
- Clear indication of available hot water

Hestia demand response
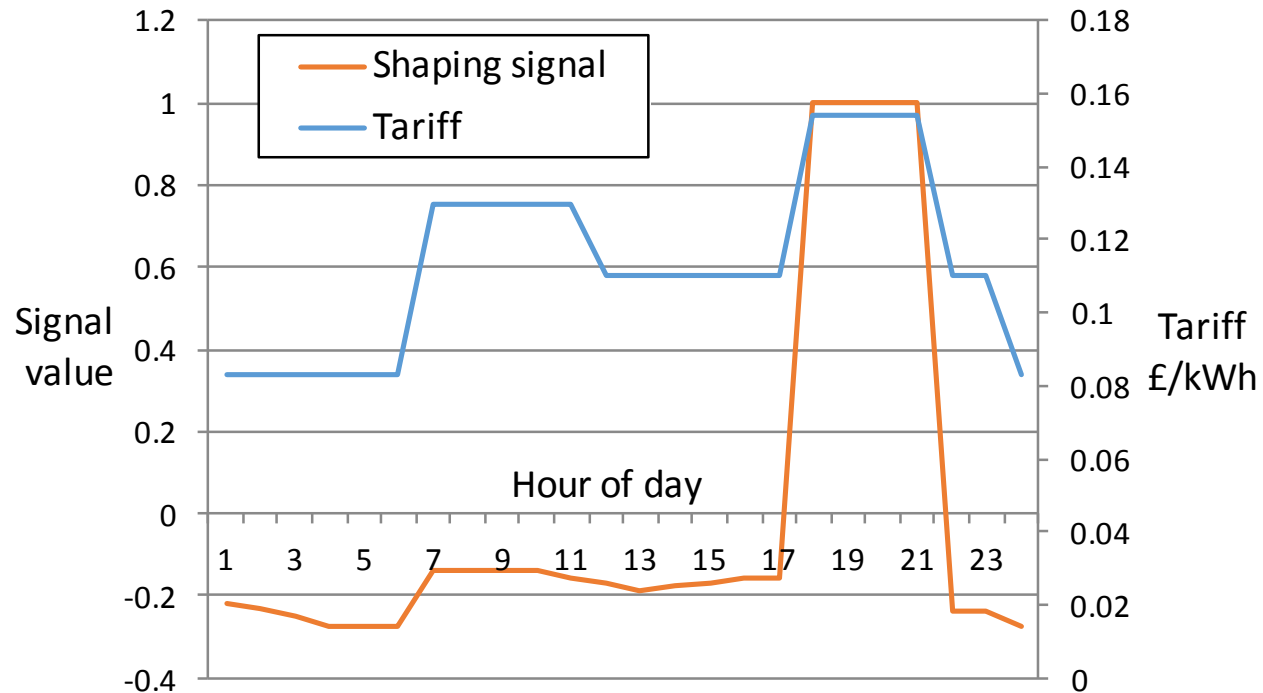
- Heating demand is scheduled with biased randomisation, bias given by shaping signal.
- Shaping signal is aligned with tariff (signal = 1 results in no scheduled demand) but ensures demand pattern is grid-friendly with no sharp peaks.

Hestia demand response – comparison with Economy 7
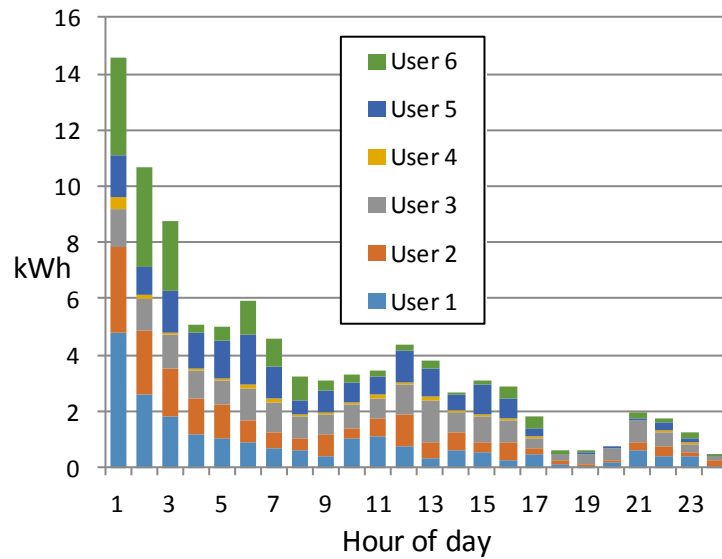
Hestia control, SWELL tariff
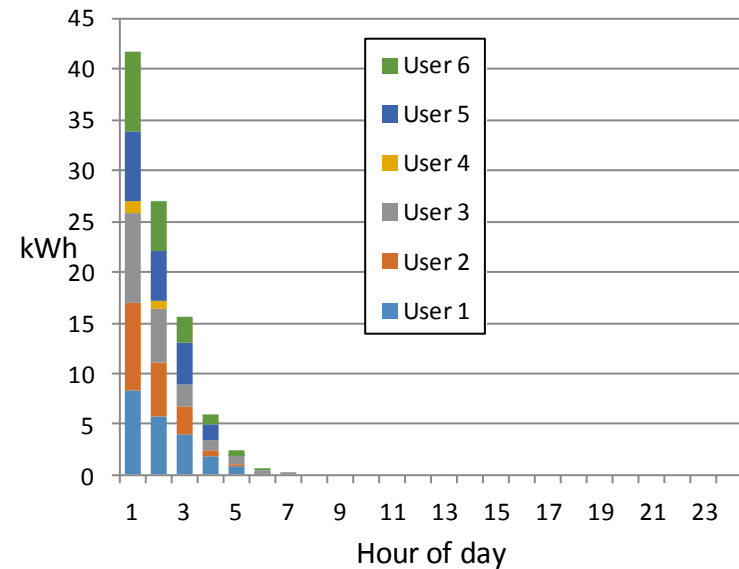
Equivalent demand, Economy 7

- Aggregate controlled demand for 6 users in February – note kWh scale – max demand reduced 65%
- Mid day peak under Hestia reflects SWELL fixed tariff plus some local low cost PV generation available.
- Early evening demand in high cost period user-driven mainly hot water.
- 5 out of 6 users saved energy with SWELL (average – 8%), 5 out of 6 saved money (average – 10%)
- Full details in journal paper at http://dx.doi.org/10.1016/j.enbuild.2016.12.053