How to ENLITEN on Energy

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University of Bath

Low Carbon Business Breakfast – Bath

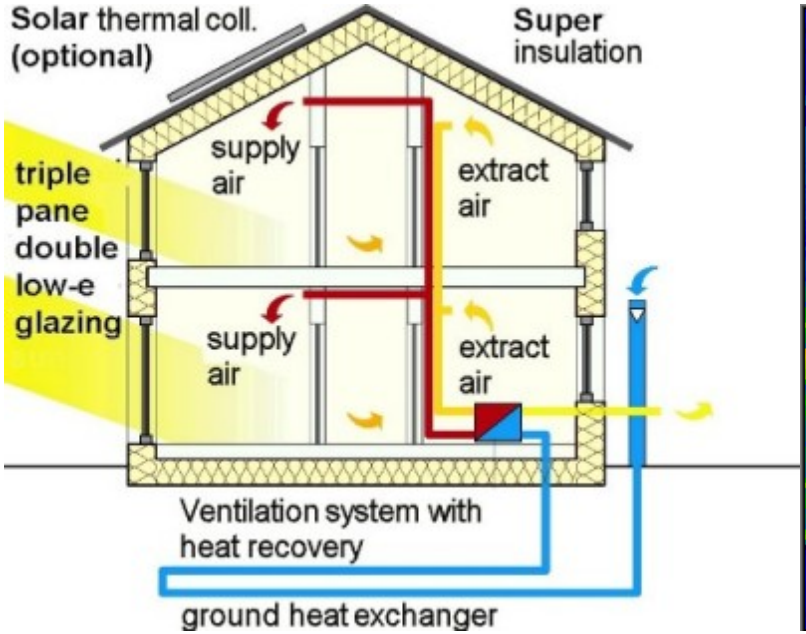
29th September 2014

Low Carbon South West

CONSULTANT
CERTIFIED PASSIVHAUS CONSULTANT

PassivHaus Buildings

- PassivHaus: well-controlled in *almost* every element.



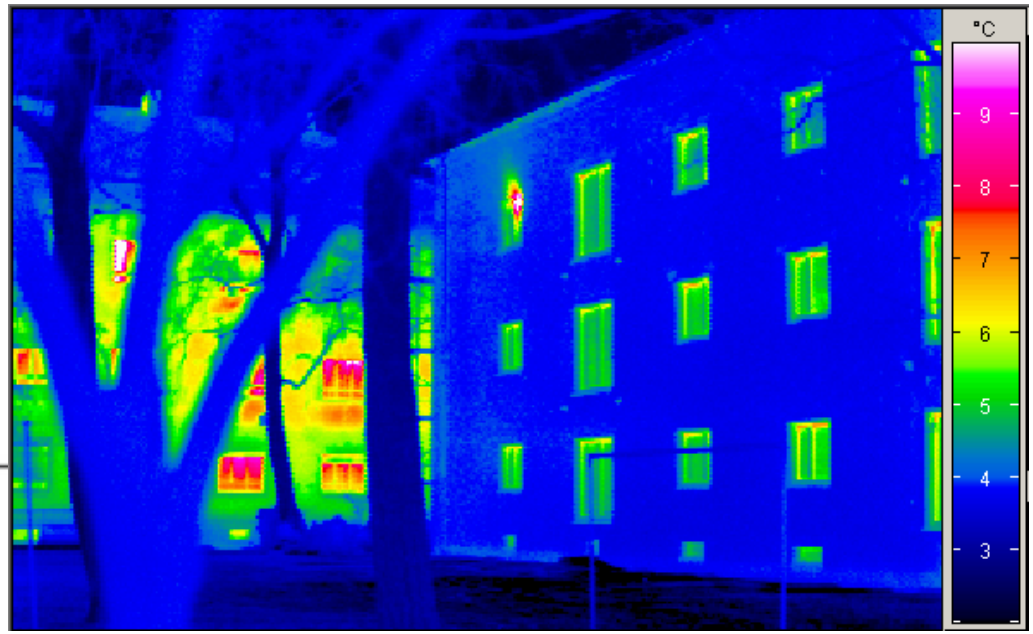
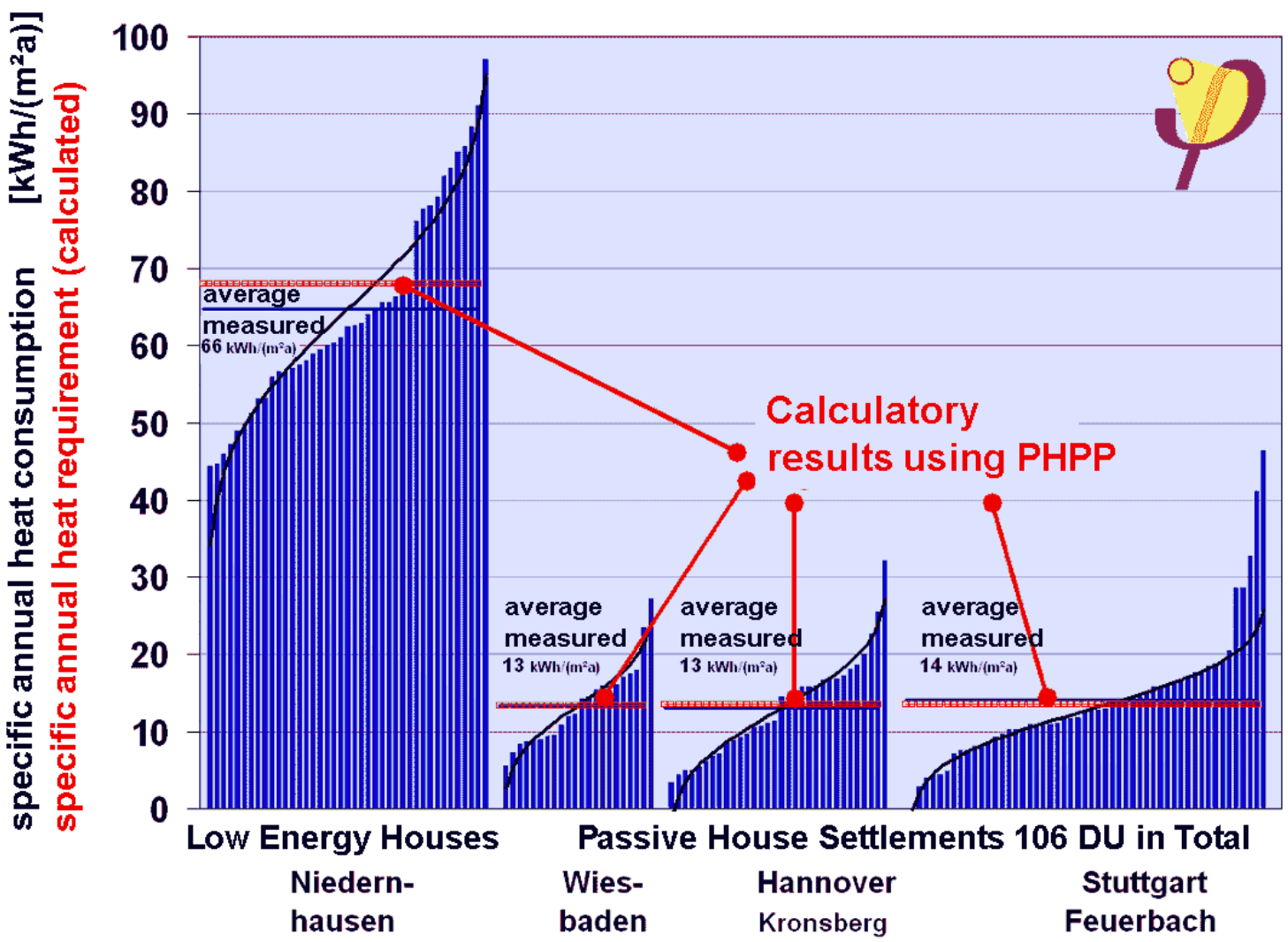


Figure: `http://passipedia.passiv.de/passipedia_en`

Energy Consumption in Passive Houses



The Final Building Component

- What causes the variation in energy use?
  - Particularly for high-end outliers...

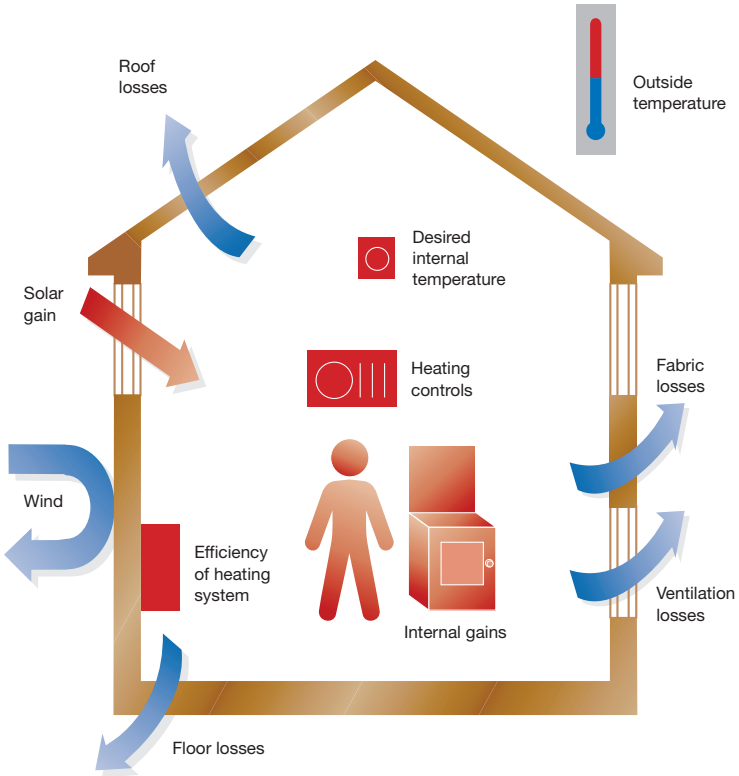


Figure: Building Research Establishment Domestic Energy Model (BREDEM)

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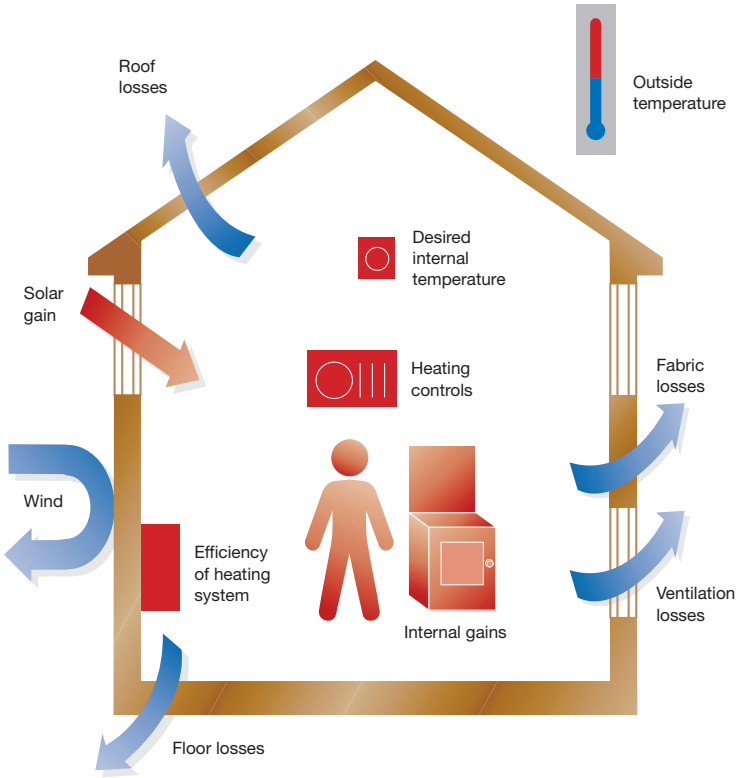


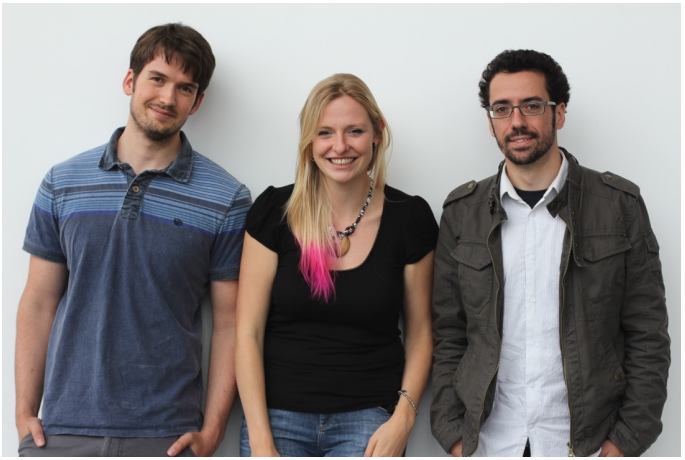
The Occupant!

Figure: Building Research Establishment Domestic Energy Model (BREDEM)

ENLITEN

ENergy LIteracy Through an Intelligent Home ENergy Advisor

To reduce carbon emissions from energy use in dwellings by developing a **low-cost intelligent** home energy advisor that will provide **actionable prompts** to households that they can use to save money and energy.



Exeter City Council

Wessex Water a YTL company

Buro Happold

Parliamentary Office of Science and Technology

Department of Energy & Climate Change

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KING SHAW ASSOCIATES Consulting Engineers

ISA Intelligent Sensing Anywhere

Low Carbon South West

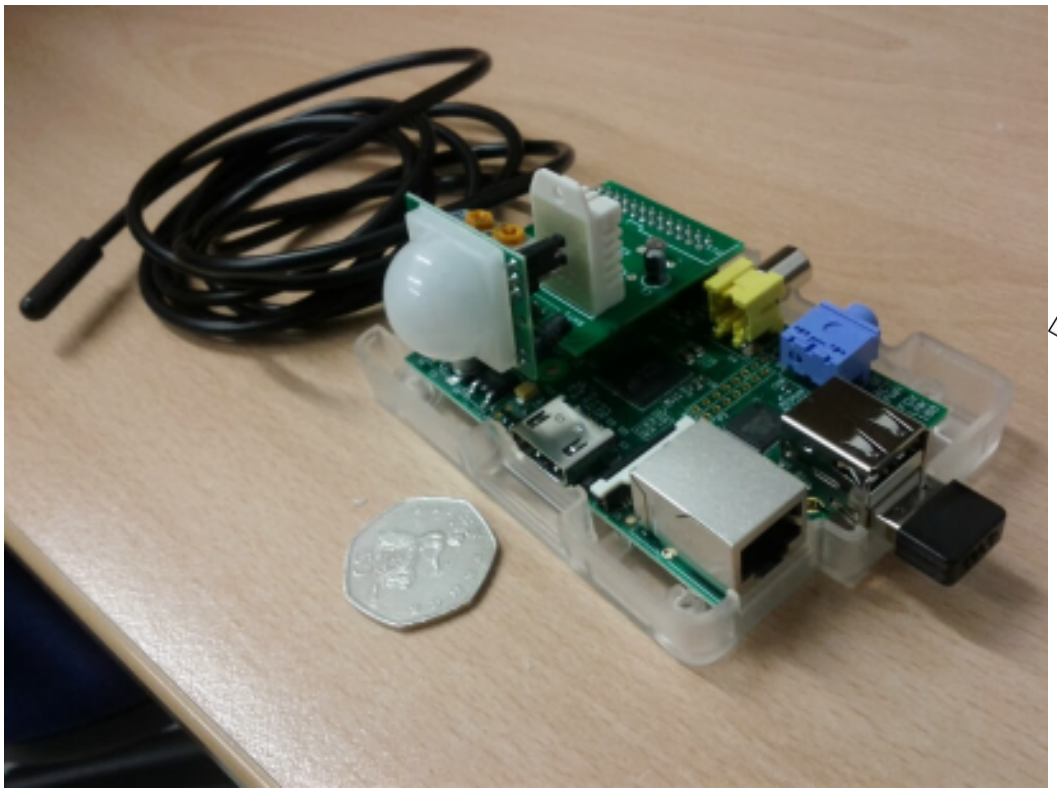
npower

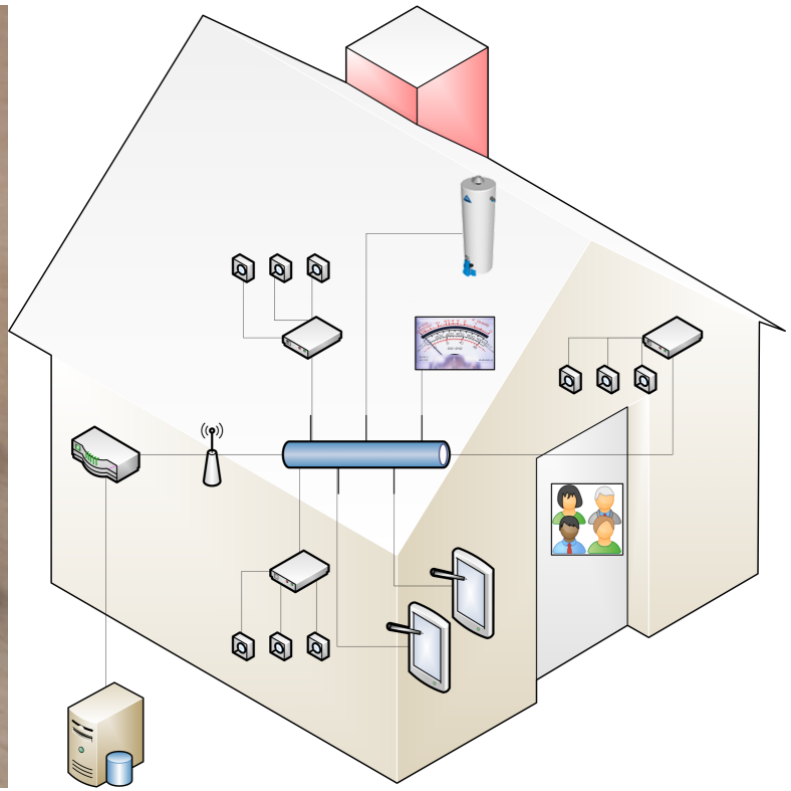
science scope

MAX FORDHAM

Energy Sensor Infrastructure

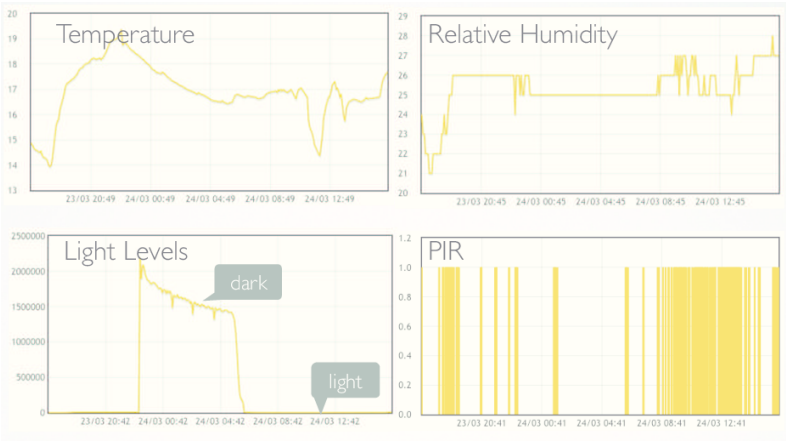
- model domestic buildings' thermal properties using data from low-cost sensor networks in each building.

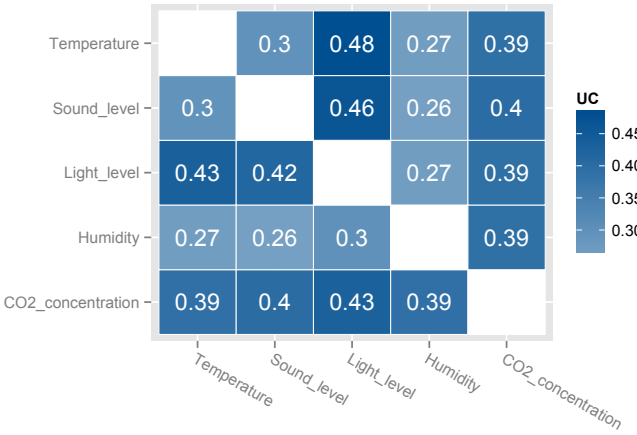


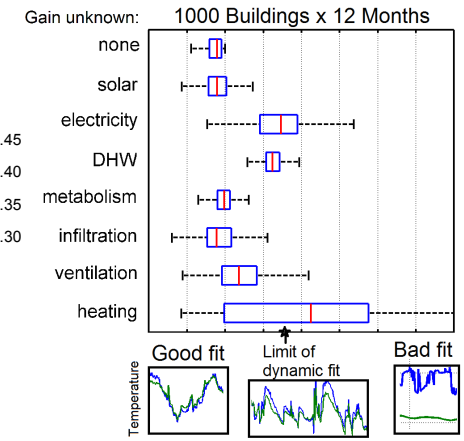


Dynamic Building Energy Model

- Developing a novel intelligent system that builds and maintains a dynamic building energy model,
  - including an auto-generated thermal model.

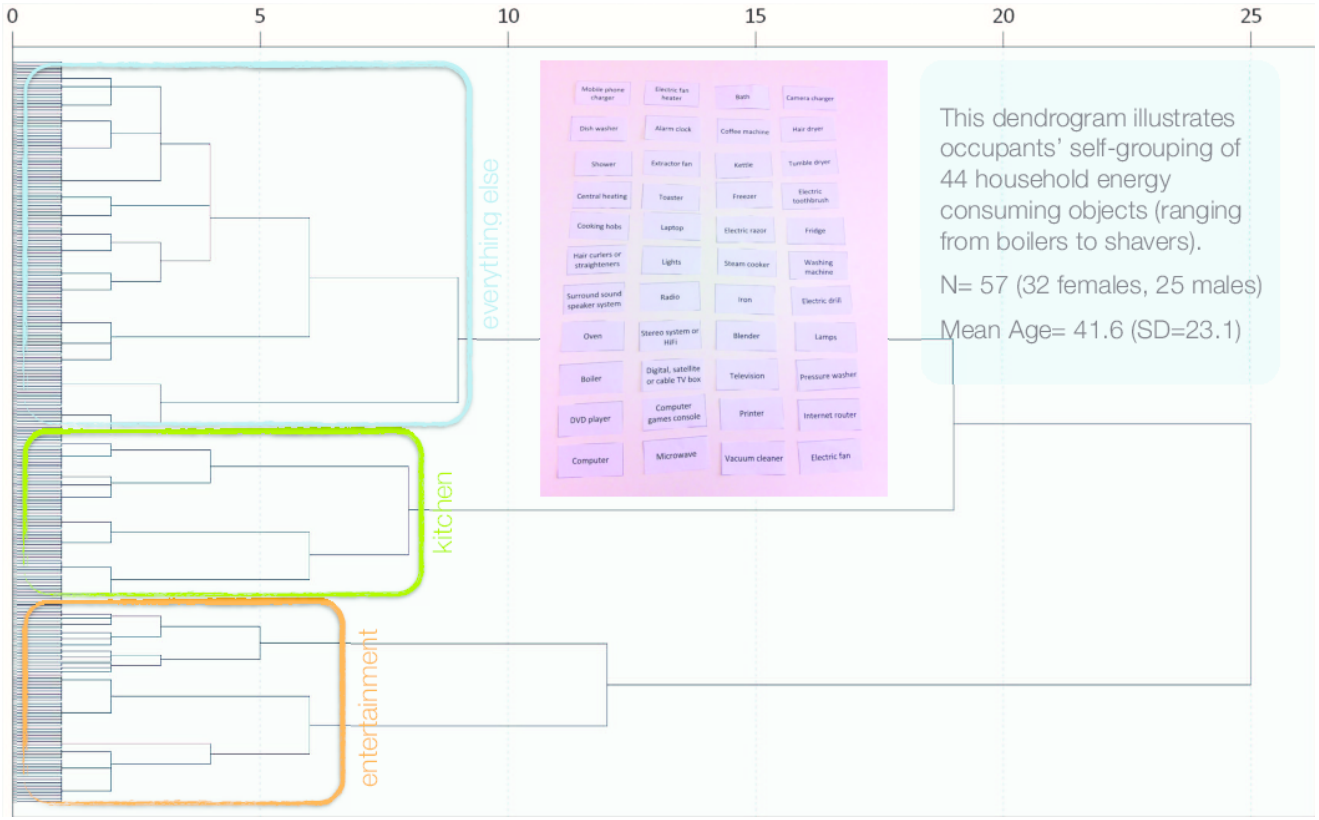






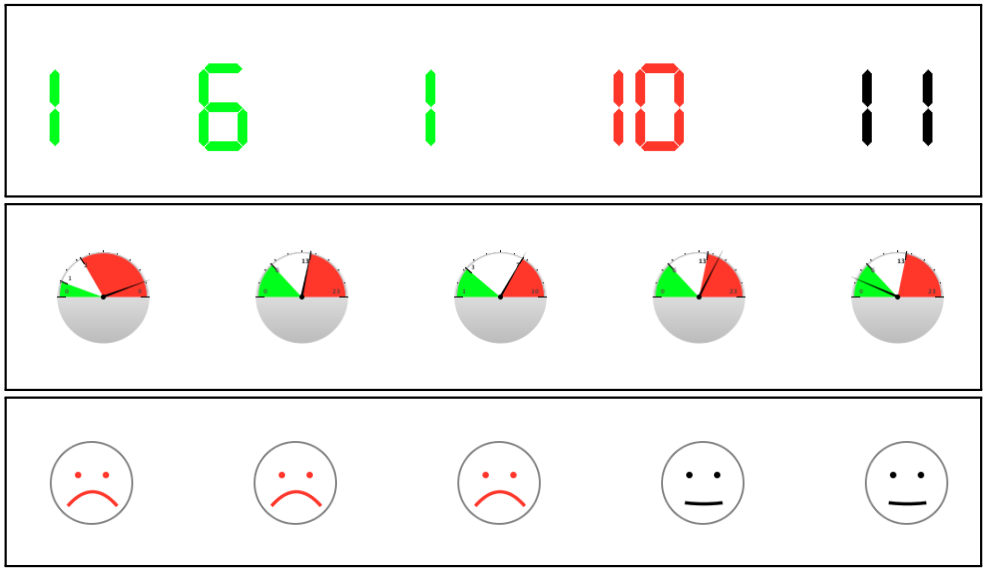
Building Occupant Model

- Understanding of the role of habit in occupants' energy demand and attitudes to carbon saving.
  - drawing on a range of sensing and human data analysis.



In-Building Interactive Tool (iBERT)

- A unique whole building energy model, bringing together the building energy and occupant models.
  - Interactive tool to help identify and improve energy habits.
  - Providing customised, actionable prompts rather than poorly understood numerical energy estimates.



The Bottom Line

How can we help deliver the full potential of PassivHaus?

- Digital technologies are extremely good at producing information.
- But information $\neq$ feedback.
- Feedback needs to be tailored, meaningful and immediate.
- We need to understand how each household "uses energy" to understand what feedback we should provide.

www.cs.bath.ac.uk/enliten

ENLITEN

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Project Partners

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Welcome to the ENLITEN project

ENLITEN is a multi-disciplinary collaborative research project between the Universities of Bath and Oxford.

Our aim is to reduce carbon emissions from energy use within buildings by understanding, incentivising and influencing changes in the habitual behaviours of the buildings' occupants. This project brings together expertise from a range of disciplines including: low carbon design; architecture and civil engineering; electronic and electrical engineering; computer science; environmental psychology; and habitual behaviour. In achieving this aim we will meet five key objectives:

- Dynamic Building Energy Model

Our approach will model domestic buildings' thermal properties using data obtained from low cost sensor networks installed within each building. This will lead to the development of a novel intelligent system that builds and maintains a dynamic building energy model, including an auto-generated thermal model.

- Building Occupant Model

We will develop an unprecedented understanding of the role of habit in occupants' energy demand and attitudes to carbon saving. We will draw on a wide range of automated sensing and human data analysis. This will give occupants insight into their own energy consuming behaviours, in particular those which are performed automatically.

- In-Building Interactive Tool (iBERT)

A unique whole building energy model will be developed by bringing together the building energy and occupant models. This will underpin the design, development and evaluation of an in-building interactive tool to help the occupants identify and break poor energy habits and form better ones. The tool will provide customised, actionable prompts rather than numerical energy estimates, which are poorly understood by occupants.

UNIVERSITY OF BATH

UNIVERSITY OF OXFORD

Latest News

ENLITEN ARE AT ENVPSYCON2013 IN MAGDEBURG, GERMANY.
23rd September 2013

CHECK OUT OUR VIDEO AND ARTICLE ON THE UNIVERSITY'S RESEARCH PAGE
29th July 2013

TWO ABSTRACTS ACCEPTED FOR ENVPSYCON2013.
Oral presentation for symposium and poster. Magdeburg, Germany
18th April 2013

ENLITEN CONFERENCE PAPER ACCEPTED