Translating monitoring data into input data for model calibration & Future house/people/systems

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Current work – model calibration

Real building (left) simulated (right)

Internal layout of the building
Monitoring data

- Passive infrared (PIR) sensors
- Window & door monitoring for open/close
- Hot water volume and temperature
- Gas flow rate
- Mains, circuits, and appliance plug load, upward of 15 monitored points per home
- Space and system temperatures
Input files for model calibration

- Ventilation
- Occupancy schedule
- Heating set point temperature
- Heating schedule
- Hot water
- Appliances + lighting
PIR, window and door sensors
Living room PIR

2012-11-02

Time (min)
Boiler on/off detection

02/11/12 : Fri

Chart showing temperature changes over time.
Dishwasher detection

02/12/12 : Sun

Temperature (degC)

01:00 05:59 11:00 16:00 20:59

02:00 07:00 12:00 17:00 22:00
Washing machine detection
Into the future

• Aim: to evaluate the potential ‘stresses’ on hot water provision in future homes
Future scenarios

• Building fabric upgrade: now, likely upgrade, passive house standard
• Hot water demand profiles: high, medium, low consumption profiles
• Systems: heat pumps, solar thermal, PV, resistive heating, thermal storage (water, PCM), battery
Thank you