



Rapid Diagnostics: Investigating a Rapid, Low Cost, Non-Invasive Tool to Test Domestic Building's Thermal Performance

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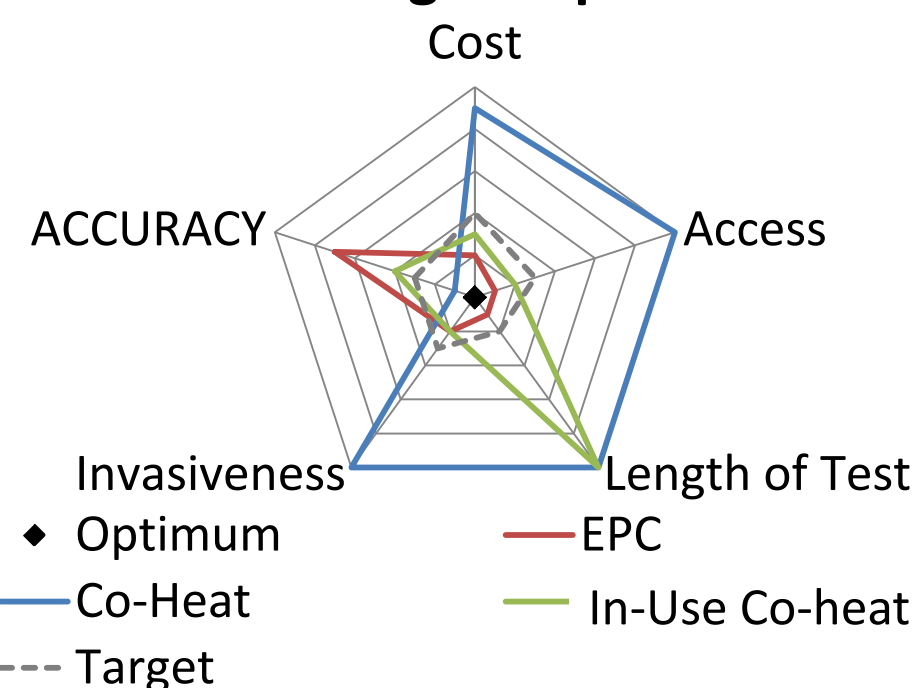
"If you can not measure it, you can not improve it." – Lord Kelvin

The aim of this PhD is to develop and validate low cost domestic building thermal **fabric performance measurement methods** which have minimal adverse impact on an occupant's lifestyle to enable improved estimates of energy demand.

Background

- The housing stock contributed **27%** of the UK's total CO₂ emissions in 2010.
- Reduced energy consumption creates a financial incentive to refurbish.
- However, savings in the energy bill predicted by generalised building models are prone to marked inaccuracies.
- These inaccuracies could be reduced by accurate **measurement of fabric performance**.

The Testing Compromise



The project seeks a testing method which comprises an acceptable compromise of key variables.

Findings:

- During the first year of the project new testing methods were trialled in **unoccupied** test houses.
- These pilot experiments have shown the potential of an 'in-use co-heat' approach; this less invasive variant of the co-heating test uses the house's incumbent heating system and can be carried out during normal occupancy.
- In the pilot experiments the 'in-use co-heat' method gave results within **10% of those gathered from a full co-heating test**.

Next Steps:

- The new method will now be tested under simulated occupancy conditions in a test house to test its robustness to casual gains and window/door opening.
- The method will also be tested in occupied houses of different construction types.

The Problem:

The current state of the art whole-house measurement technique – *the co-heating test* – has severe practical limitations:

- The building must be unoccupied.
- Two week testing period

