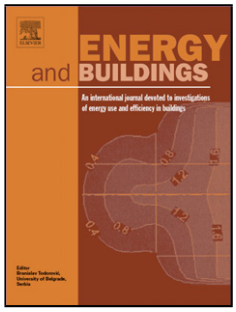

Title: Modelling and Monitoring Five Energy Retrofit Houses in South Wales

Authors: Phil Jones, XiaoJun Li, Emmanouil Perisoglou, Jo Patterson

PII: S0378-7788(17)31353-1
DOI: http://dx.doi.org/10.1016/j.enbuild.2017.08.032
Reference: ENB 7861

To appear in: *ENB*

Received date: 14-4-2017
Revised date: 28-7-2017
Accepted date: 15-8-2017

Please cite this article as: Phil Jones, XiaoJun Li, Emmanouil Perisoglou, Jo Patterson, Modelling and Monitoring Five Energy Retrofit Houses in South Wales, Energy and Buildingshttp://dx.doi.org/10.1016/j.enbuild.2017.08.032

Modelling and Monitoring Five Energy Retrofit Houses in South Wales

Phil Jones, JonesP@cardiff.ac.uk (corresponding author)

XiaoJun Li, JungLiX@cardiff.ac.uk

Emmanouil Perisoglou, PerisoglouE2cardiff.ac.uk

Jo Patterson, Patterson@cardiff.ac.uk

Welsh School of Architecture

Cardiff University

King Edward VII Avenue

Cardiff CF10 3NB

Highlights:

- Combines computer energy simulation and field measurements to analyse the seasonal energy performance of five whole-house energy retrofits located in south Wales, UK.
- Presents the annual energy, CO2 and cost savings associated with combining energy efficiency measures, building integrated solar PV, and battery storage.
- Presents the costs of retrofitting with an emphasis on affordability.
- Estimates the in-house energy use of battery storage and associated costs and cost savings.

Abstract:

With around 1-2% annual replacement of the UK's housing stock, housing retrofit must play a major role in reducing future energy use and CO_2 emissions. This paper presents a whole-house approach for energy retrofit for five houses located in south Wales. This 'systems based' approach combines reduced energy demand, renewable energy supply and battery storage. The paper describes a combination of energy modelling, using the building energy model HTB2, and field measurements to analyse the performance of the houses before and