

# The Solihull OWLS Project (Off-site Wrap-around Large Scale Retrofit)

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UK Passivhaus  
Conference 2015

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**Innovate UK**  
Technology Strategy Board

# OWLS is an Innovate UK-funded Collaborative R&D Project

Funder



Client



Project concept leadership and management



System and build



Monitoring and behaviour change



@beattiepassive and @encraft\_uk

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# Encraft works at the leading edge of the low carbon energy and buildings sector

The company has grown from a start-up in 2003 to employ 20 professional staff and operate in three specialist areas

## Distributed Energy Projects

- Community energy
- Smart grids
- District heating and CHP
- Feasibility studies
- Project development
- Programme management

## Building Physics

- Certified Passivhaus Consultants
- Building energy modelling
- Very low carbon retrofit
- First-principles design
- Technology analysis

## Web Applications

- Microgeneration specification tools
- Planning compliance
- Asset review
- Bespoke web applications
- Mobile devices

**CUSTOMER-LED INNOVATION**



Kate Ashworth  
CEng MIMechE  
Practice Head



Helen Brown  
MPhys, CEPH  
Practice Head



Graham Eastwick  
CEng MIET  
Practice Head



# Agenda

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- Introduction
- Project progress to date
- Delivering at scale



# Innovate UK – Scaling up Retrofit Project

- **One of only nine funded across the UK**
- **Aim:** to allow consortia to *radically improve their retrofit products* in order to bring about *greater take-up in the market*.
- **Project:** A passive retrofit of 6 flats in Solihull. Deep retrofit of the existing flat to help households save money on their bills, reduce their emissions, and make their homes warmer and more pleasant places to live



# Project Team



Project start  
Oct 2013

Today  
Oct 2015

Project end  
July 2016



Monitoring



Retrofit



Behaviour change



Management



Scaling-up



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# Looking at the way that we retrofit in the UK

- Currently the Retrofit market in the UK is not delivering the desired results
- The application of EWI without good ventilation is leading to a **vast range of health issues**
  - Research from Exeter University shows a **dramatic increase in asthma and other respiratory and allergic diseases** – as much as 40%
- BRE have identified **27 unintended consequences** that pose a significant risk to the fabric and health





# Beattie Passive TCosy™

Beattie Passive TCosy™ effectively deep retrofits existing housing stock and importantly ventilates to deliver a comfortable, healthy living environment

## 2. Quick manufacture and erection of the Beattie Passive TCosy™

- U-value:
  - Walls - 0.11w/m<sup>2</sup>k
  - Roof - 0.13w/m<sup>2</sup>k

## 3. MVHR (Mechanical Ventilation and Heat Recovery System)

Fitted in the Beattie Passive frame

Engage occupants on project and cause limited disturbance



1. Existing home

4. Triple glazed, passive certified windows and doors are fitted into the TCosy™ frame



Beattie Passive Testing and Certification ensure delivered as designed  
Structural, thermal and air testing



# Benefits of the project



## Energy security

- The Passive Retrofit is predicted to achieve **79%** reduction in heating requirement
- **£1,000 energy bill saving** per flat



## Health benefits

- Reducing impact of **cold homes**
- Improving health through **enhanced ventilation**



## Enhanced living environment for the residents

- **Warm** house in winter and **cool** in summer
- Enhanced comfort levels - **no drafts**



## Environmental

- **70%** reduction in CO2



## Up-skilling the industry

- Working with **Jericho Foundation** to train young disadvantaged



## Regeneration

- Upscaling of the project provides the opportunities to **reverse economic, social and physical decay**

# Progress to date

## Day 1 – existing flats



# Progress to date

Site cleared and trench dug around the perimeter of the building



Monarflex DPM fitted to the base of the building



# Progress to date

## Scaffolding erected



# Progress to date

Jericho Foundation are manufacturing the timber studs





# Progress to date

## Airtightness layer attached to the existing building



# Progress to date

Timber studs delivered to site and starting to be erected





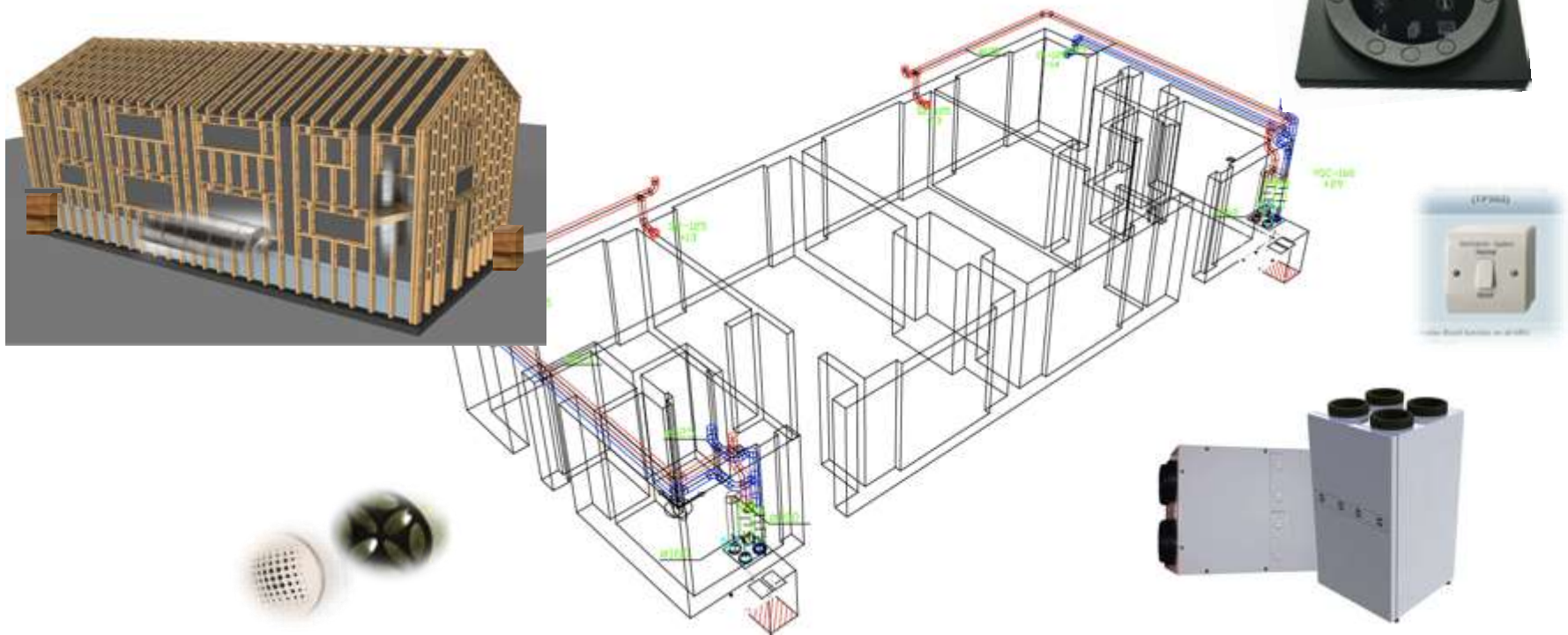
# Next steps – November - January

- Continue to erect the timber frame
- Continue to put in place airtightness detail
- Lay new roof
- Commence Mechanical Ventilation and Heat Recovery installation
- Install Ecobead insulation
- Install new windows
- Fit external façade
- Beattie Passive testing and certification



# MVHR within the TCosy™

- Integrated MVHR encased in our thermal envelope delivers fresh filtered air throughout the building
- Removing moisture and smells from kitchens and bathrooms
- Easy access for maintenance and limited tenant access to controls
- Reduces the impact of pollutants, mould, CO<sub>2</sub>, smoke, radon, humidity



# Lessons and system enhancements to date

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- **Ahead of schedule**
  - but challenges getting to the start line
- **Novel approach to MVHR**
  - transforming the way we can deliver these projects
- **Financial challenges for roll out**



# Changing the rules

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- CEIM – 12% IRR for retrofit, microgeneration, EVs and quantified health benefits for a £3m scheme across the whole area
  - Smart technologies and metering key alongside passivhaus
  - Microgeneration and storage key but at community level
  - Automating the engagement and selection process
- Local energy companies and energy billing
  - Ideally with national regulatory changes (but easier than you think)
  - EMpower

# Find out more about the project

Read the **weekly blog** posted by Archie at Encraft



<https://encraftpassivhaus.wordpress.com/photo-diary/>

## Attend a **Solihull Retrofit Event**

- The project team are holding two events in November to visit the site and find out more about the project
- **Free to attend - Register your interest** at the Beattie Passive stand to attend one of the events or email enquiries@beattiepassive.com

# Any Questions?

For more information:

## Encraft



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[@encraft\\_uk](https://twitter.com/encraft_uk)



**Weekly Blog:** <https://encraftpassivhaus.wordpress.com/photo-diary/>



## Beattie Passive

[www.beattiepassiveretrofit.com](http://www.beattiepassiveretrofit.com)

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Stand PHC-18

Demonstrations at 2.10pm and 4.15pm

