

# Whole House Retrofit and EnerPhit

APSE Conference

22.02.24

Chris Morgan, Director

# Challenges for Local Authorities?

Finance

Expertise and Skills

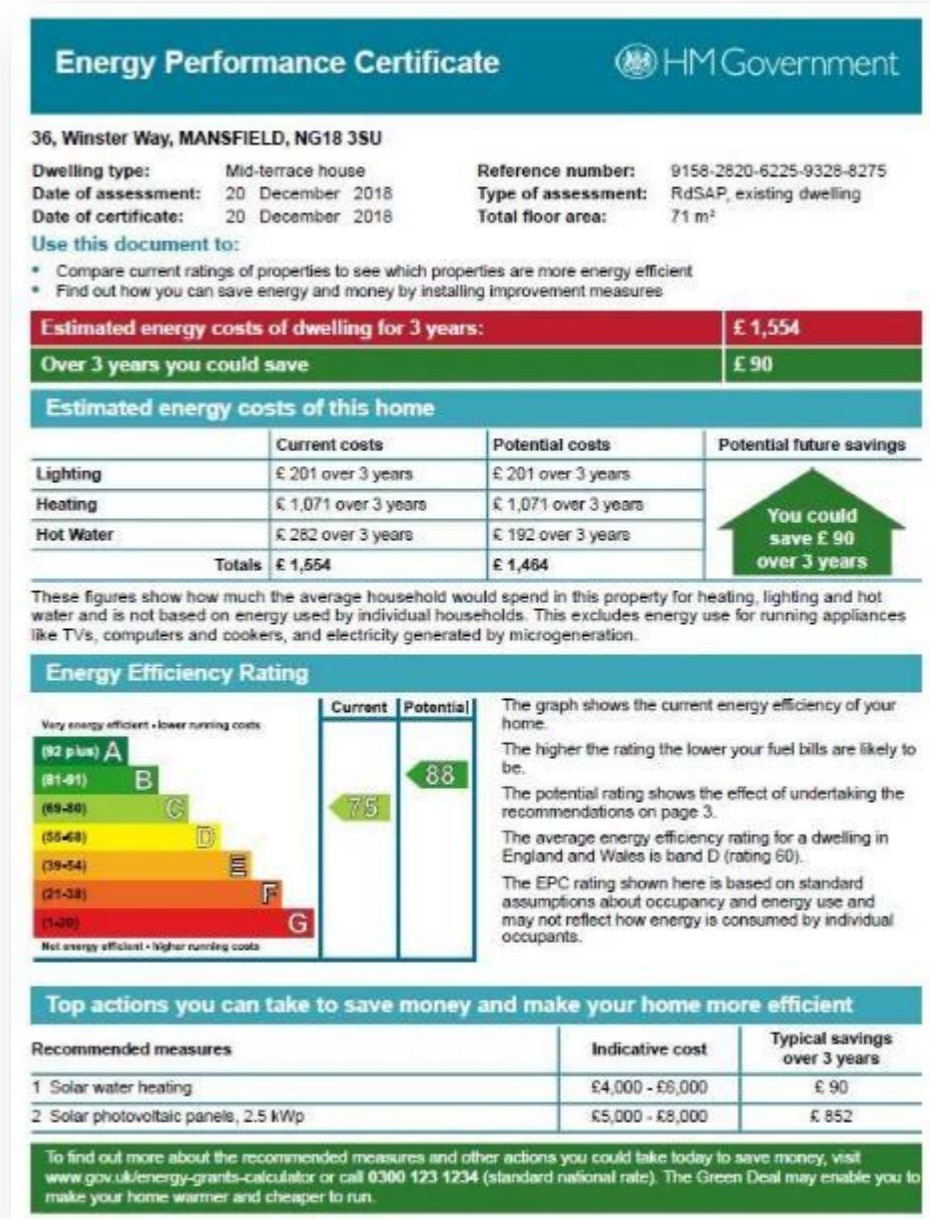
*Awareness*

# Awareness:

## EPCs - Quality / Quantity

### Two myths:

- 1. EPC ratings accurately describe energy efficiency*
- 2. Retrofit which concentrates on these metrics is adequate*

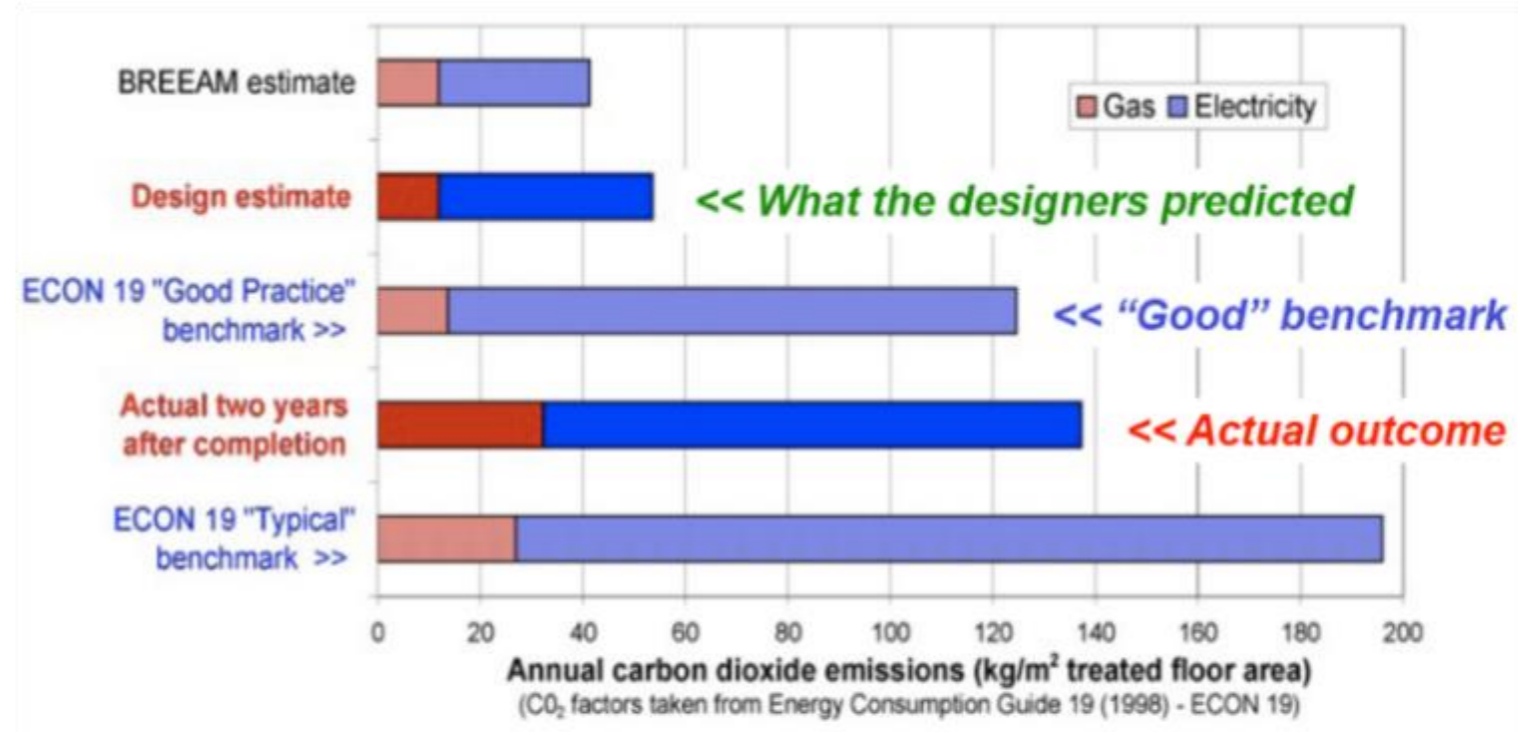


# Mythbusting 1:

1. *EPC ratings accurately describe energy efficiency*

Not true because of the Performance Gap

Solved by using Passivhaus methodology



source: see discussion in S Curwell et al, *Green Building Challenge in the UK*, Building Research+Information 27(4/5) 286 as presented by Bill Bordass of the Usable Buildings Trust in August 2010 in a talk entitled "A new Professionalism: An Introduction to Soft Landings"

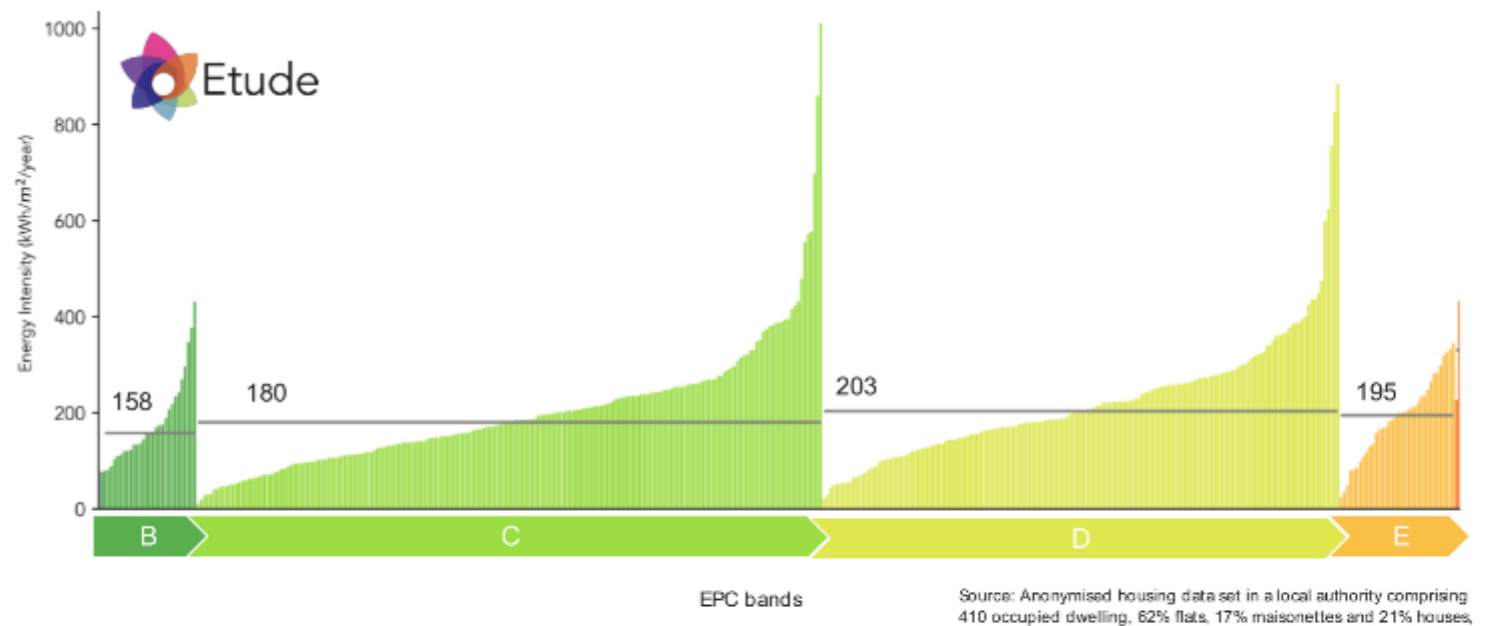
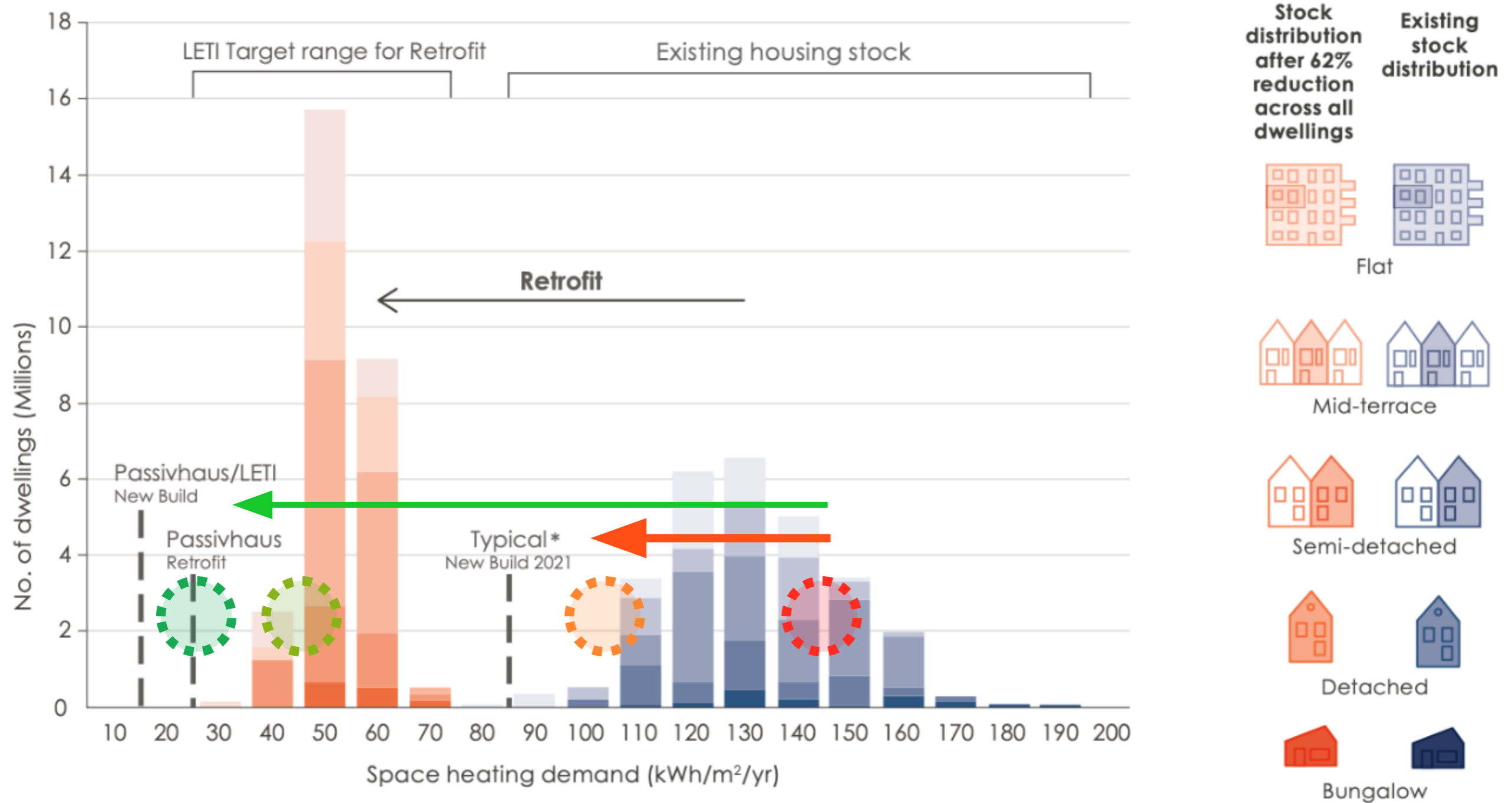


Figure 1: Illustration of disconnect between EPC bands and actual energy consumption in the domestic sector: Energy intensity of 410 homes across a local authority in England, by EPC rating. Each bar represents a single dwelling's energy intensity over the course of a year (credit: Etude)

# Mythbusting 1 and Perspective on Retrofit Standards



\* Includes for an assumed performance gap

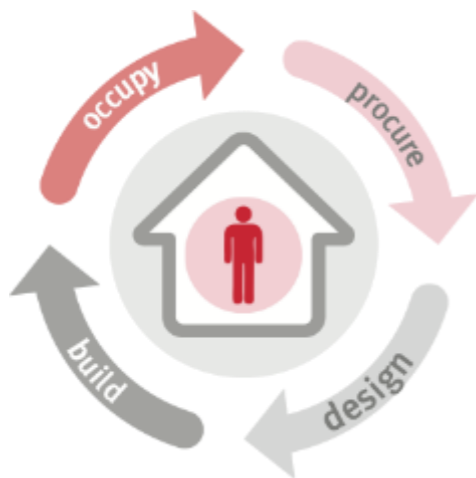
**Figure 0.1** - Total number of UK dwellings broken down by their space heating demand, showing the transition required from existing levels of high demand to the LETI retrofit target range. Figure based on stock modelling carried out by LETI.

Mythbusting 2:

*2. Retrofit which concentrates on these metrics is adequate*

Not true because of Unintended Consequences

Addressed by using PAS 2035 and a Whole House Approach



## Risks of standard retrofit:

- Energy savings not realised
- Discomfort: too cold / draughty / overheating
- High levels of moisture, condensation and mould
- Poor air quality
- Increased health risks
- Building fabric decay
- Loss of heritage / significance
- Poor workmanship
- Lack of understanding of installed systems
- Poor engagement from occupants
- Failure of inappropriate interventions
- Increased medium / long term costs







# Benefits of Ultra Low Energy, Whole House Retrofit

- *Carbon emissions reductions*
- *Reduced Fuel Costs for Occupants*
- *Improved Thermal Comfort*
- *Increased fuel security*
- *Reduced renewables costs*
- *Opportunity to maintain heritage*
- *Improved climate resilience*
- *Improved building value*
- *Lower embodied energy*
- *Improved neighbourhood*
- *Lifetime Guarantee (sort of)*
- *Employment / skills / materials ratio*
- *Improved occupant physical health*
- *Improved occupant mental health*

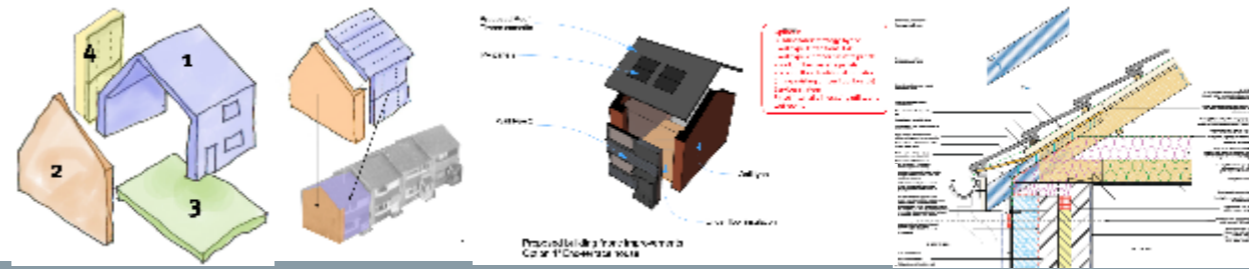


# JGA Current and Recent Projects

# Crosswalls Homes

Renfrewshire Council, Paisley

50 houses to EnerPHit



## CROSSWALLS

WHOLE HOUSE RETROFIT INNOVATION

John Gilbert  
ARCHITECTS



Photovoltaic Solar Panels

Highly Insulated Warm Roof

New Rainwater Gutters / Pipes

Triple Glazed Windows

Cavity Wall Insulation

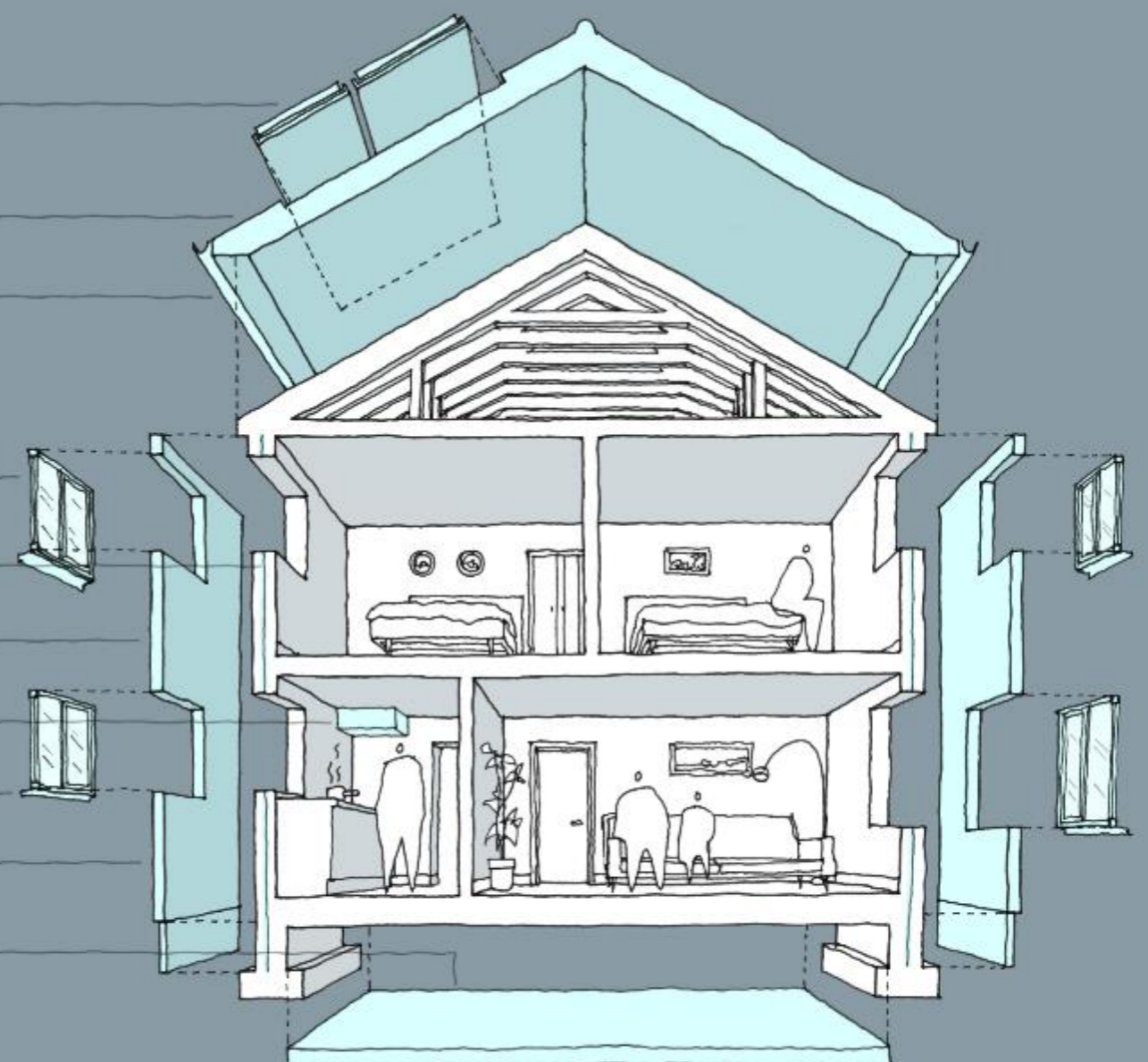
Timber Offsite Prefabricated Panels

Mechanical Ventilation Heat Recovery

Airtightness

External Wall Insulation

Underfloor Insulation



John Gilbert  
ARCHITECTS

The Crosswalls Whole House Retrofit project follows on from a successful competition entry by Renfrewshire Council and John Gilbert Architects that was won by the Department for Business, Energy and Industrial Strategy. A total of 50 cross walls houses in the Paisley area will be retrofitted to be big time up to EnerPHit standard (Equivalent to EPC A). The properties will be highly insulated, have triple glazed windows and be very airtight to retain their own heat when required.

# Renfrewshire Blocks

Renfrewshire Council, Paisley

1960s pre-cast concrete blocks



# Renfrewshire Cavities

Renfrewshire Council, Paisley

1960s cavity wall flats



# Private EnerPHit

Fort William

1 private retrofit to EnerPHit standards.



# Niddrie Road

Glasgow, Southside HA

**8** tenement flats  
retrofit to EnerPHit  
standard.



# Hill Avenue, Wick

Cairn HA

**2** terraced homes to EnerPHit standard.





# St. Sophia's PS

East Ayrshire Council

Pre 1970's Primary School retrofit to EnerPHit standard.





# Modern TF Homes to AECB and ESSH2

Loreburn HA

Modern (9 years old) TF homes with tenants in serious fuel poverty in pilot project comparing AECB to ESSH2 standards



# Westmoreland Street, Glasgow

Govanhill HA

Corner block retrofit of 8 flats to AECB standard.



Thank you.

