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

Energy Perform	nance Certifica	te ()	HMGc	vernment	
36, Winster Way, MANSFIEL	D, NG18 35U				
Date of assessment: 20 D		Type of assessment: Total floor area:	RdSAP, exis 71 m²	5225-9328-8275 ting dwelling	
Estimated energy costs of dwelling for 3 years:			£1	,554	
Over 3 years you could		£9	0		
Estimated energy cos					
Esumated energy co.	Current costs	Potential costs	Poter	itial future savings	
Lighting	£ 201 over 3 years	£ 201 over 3 years	- Old		
Heating	£ 1,071 over 3 years	£ 1,071 over 3 years			
Hot Water	£ 282 over 3 years	£ 192 over 3 years	- 1	You could save £ 90	
Totals	€ 1.554	€ 1,464		over 3 years	
ike 1 vs, computers and cooke	rs, and electricity generate	d by microgeneration.		running appliances	
Energy Efficiency Ra Very source efficient - lower naming code (92 plus) A (91-91) B (99-94) C (99-94) C (99-94) C (19-94) C (Current Potential	The graph shows the c home. The higher the rating th be. The potential rating sho recommendations on p The average energy ef England and Wales is I The EPC rating shown assumptions about occ may not reflect how en occupants.	urrent energy te lower your ows the effect age 3. ficiency ratin band D (ratin here is base upancy and ergy is consi	y efficiency of your fuel bills are likely t t of undertaking the g for a dwelling in g 60). d on standard energy use and imed by individual	
Energy Efficiency Ra Very rowgs efficient - lower nerving code (92 plus) A (91-41) B (93-90) C (34-43) C (34-43) C (14-10) Hist energy efficient - Higher number code Top actions you can	Current Potential	The graph shows the c home. The higher the rating th be. The potential rating sho recommendations on p The average energy ef England and Wales is I The EPC rating shown assumptions about occ may not reflect how en occupants.	e lower your was the effect age 3. ficiency ratin band D (ratin here is base upancy and ergy is consu me more	y efficiency of your fuel bills are likely t t of undertaking the g for a dwelling in g 60). d on standard energy use and imed by individual	
Energy Efficiency Ra Very energy efficient - lower norming codes (92 plue) A (81-91) B (93-90) C (36-43) C (39-54) C (21-08) Ret energy efficient - Nigher number code	Current Potential	The graph shows the c home. The higher the rating th be. The potential rating sho recommendations on p The average energy ef England and Wales is I The EPC rating shown assumptions about occ may not reflect how en occupants.	urrent energy the lower your nvs the effect age 3. ficiency ratin here is base upancy and ergy is consu me more cost	fuel bills are likely t t of undertaking the g for a dwelling in g 60). d on standard energy use and imed by individual efficient Typical savings	

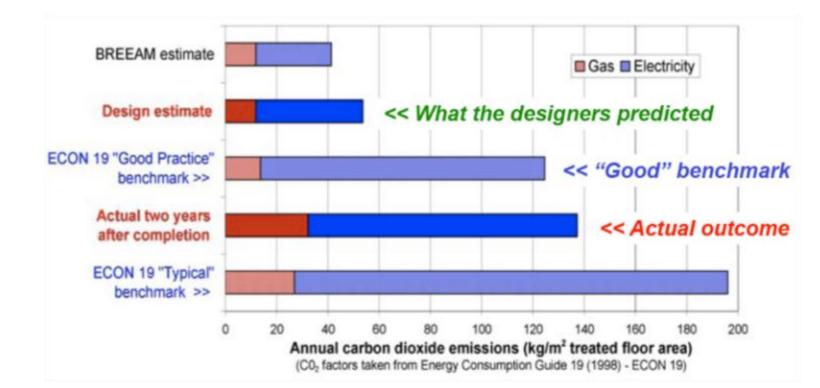


Mythbusting 1:

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

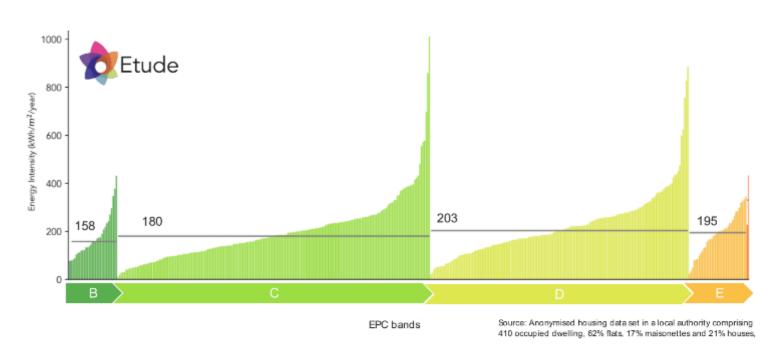
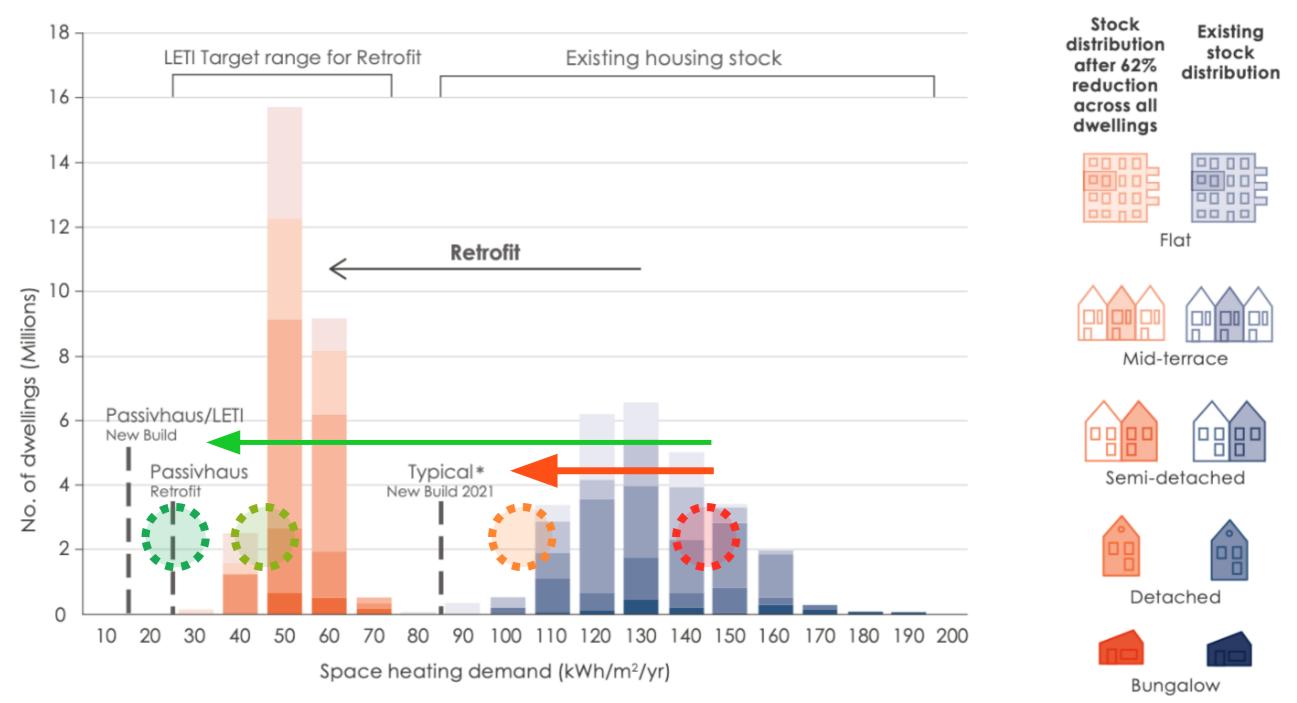


Figure 1: Illustration of disconnect between EPC bands and actual energy consumption in the domestic sector: Energy intensity of 410 homes across a local authority in England, by EPC rating. Each bar represents a single dwelling's energy intensity over the course of a year (credit: Etude)



Mythbusting 1 and Perspective on Retrofit Standards



* Includes for an assumed performance gap

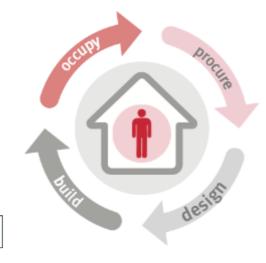
Figure 0.1 - Total number of UK dwellings broken down by their space heating demand, showing the transition required from existing levels of high demand to the LETI retrofit target range. Figure based on stock modelling carried out by LETI.

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



lohn Gilber

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

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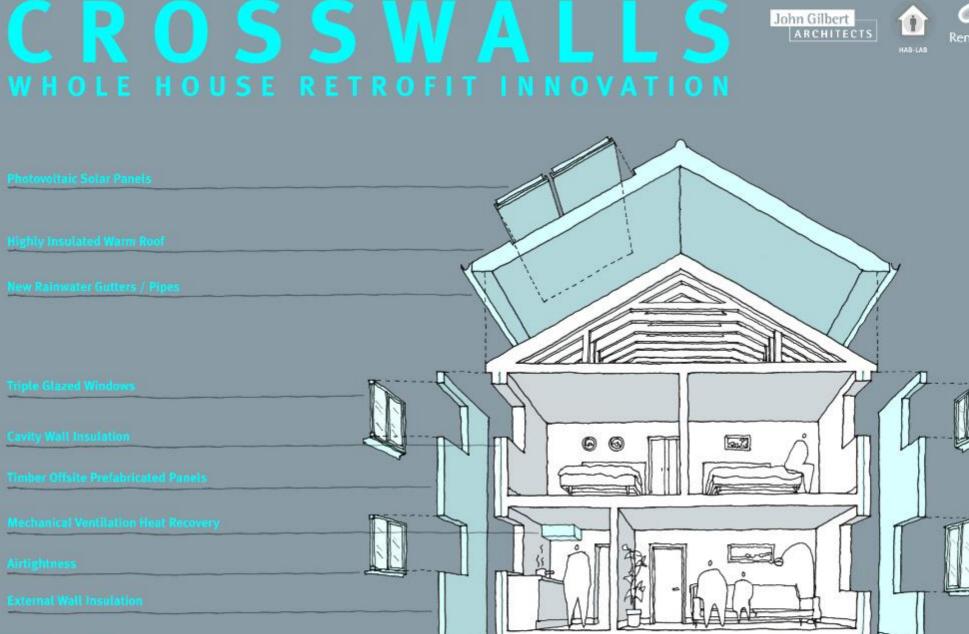
- Carbon emissions reductions
- Reduced Fuel Costs for Occupants
- Improved Thermal Comfort
- Increased fuel security
- Reduced renewables costs
- Opportunity to maintain heritage
- Improved climate resilience
- Improved building value
- Lower embodied energy
- Improved neighbourhood
- Lifetime Guarantee (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







Underfloor Insulation

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

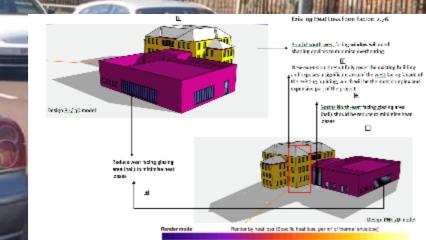
Pre 1970's Primary School retrofit to EnerPHit standard.



St. James Gaelic School

Glasgow City Council

Victorian School retrofit to EnerPHit standards.



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Modern TF Homes to AECB and EESSH2

Loreburn HA

Modern (9 years old) TF homes with tenants in serious fuel poverty in pilot project comparing AECB to EESSH2 standards





Westmoreland Street, Glasgow

Govanhill HA

Corner block retrofit of 8 flats to AECB standard.





