



Thermal renovation of building fabric using modern insulation materials



Overview of Presentation

- Why we need to retrofit ?
- Perceived barriers – economic, political, social, technical, supply chain
- Choosing insulation
- Case studies
- Summary

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CO2



The UK Government has committed to cut carbon emissions by 34% by 2020 and 80% by 2050



- Housing is responsible for 27% of CO₂ emissions
- Solid wall housing accounts for over 30% of English housing stock
- No single catch-all solution to tackling the energy efficiency of our housing stock.

Benefits of deep energy retrofits

- Avoiding illness cold related health issues
- Higher indoor thermal comfort
- Job creation – supply chain
- Social inclusion (e.g. by rehabilitating poor districts)
- Reduced energy costs
- Reduced CO2 emissions

Fabric first Approach

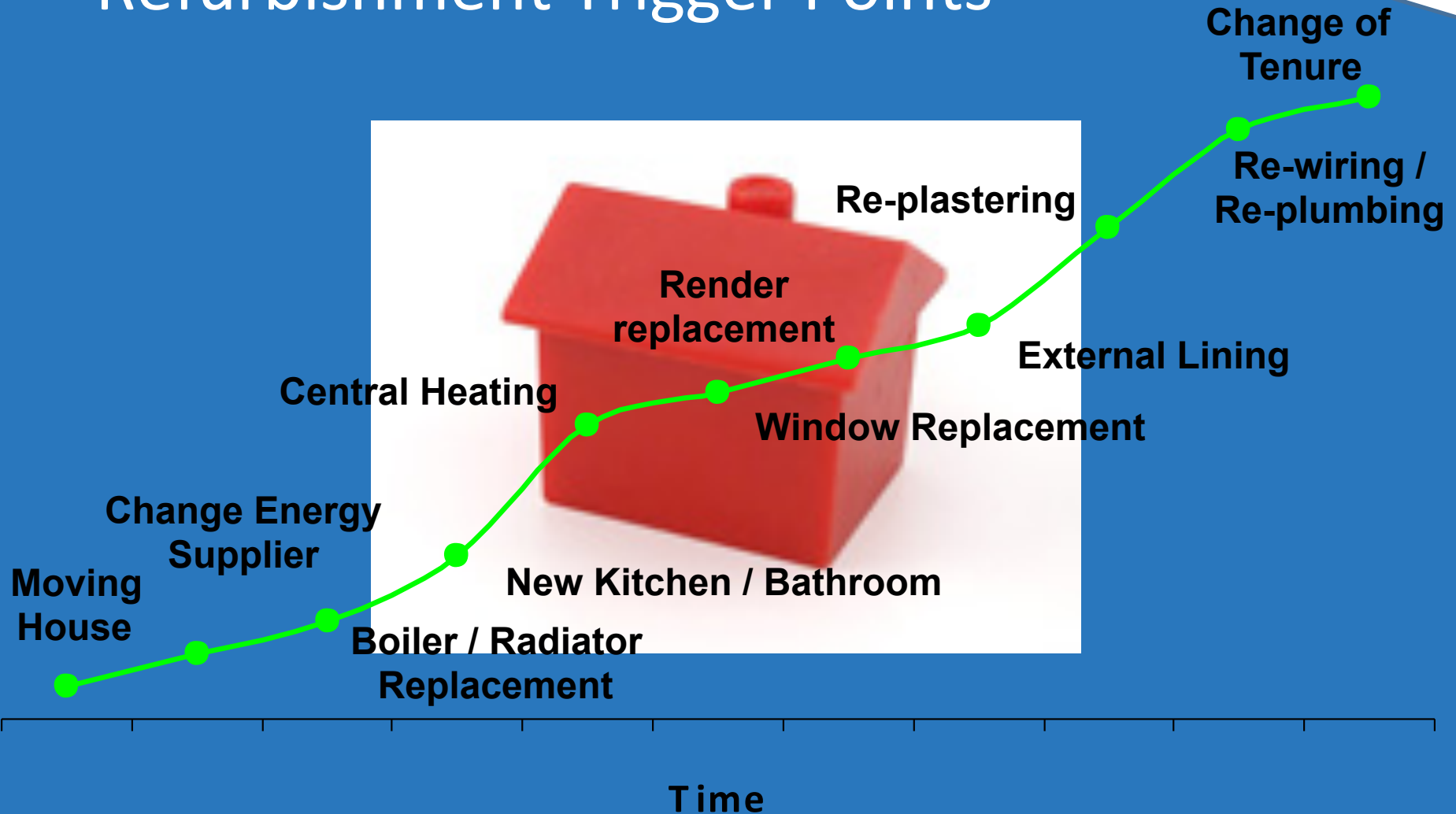


Barriers to Retrofit?

- Building aesthetics
- “Hard to treat” properties
- Consumer awareness
- Cost
- Supply Chain



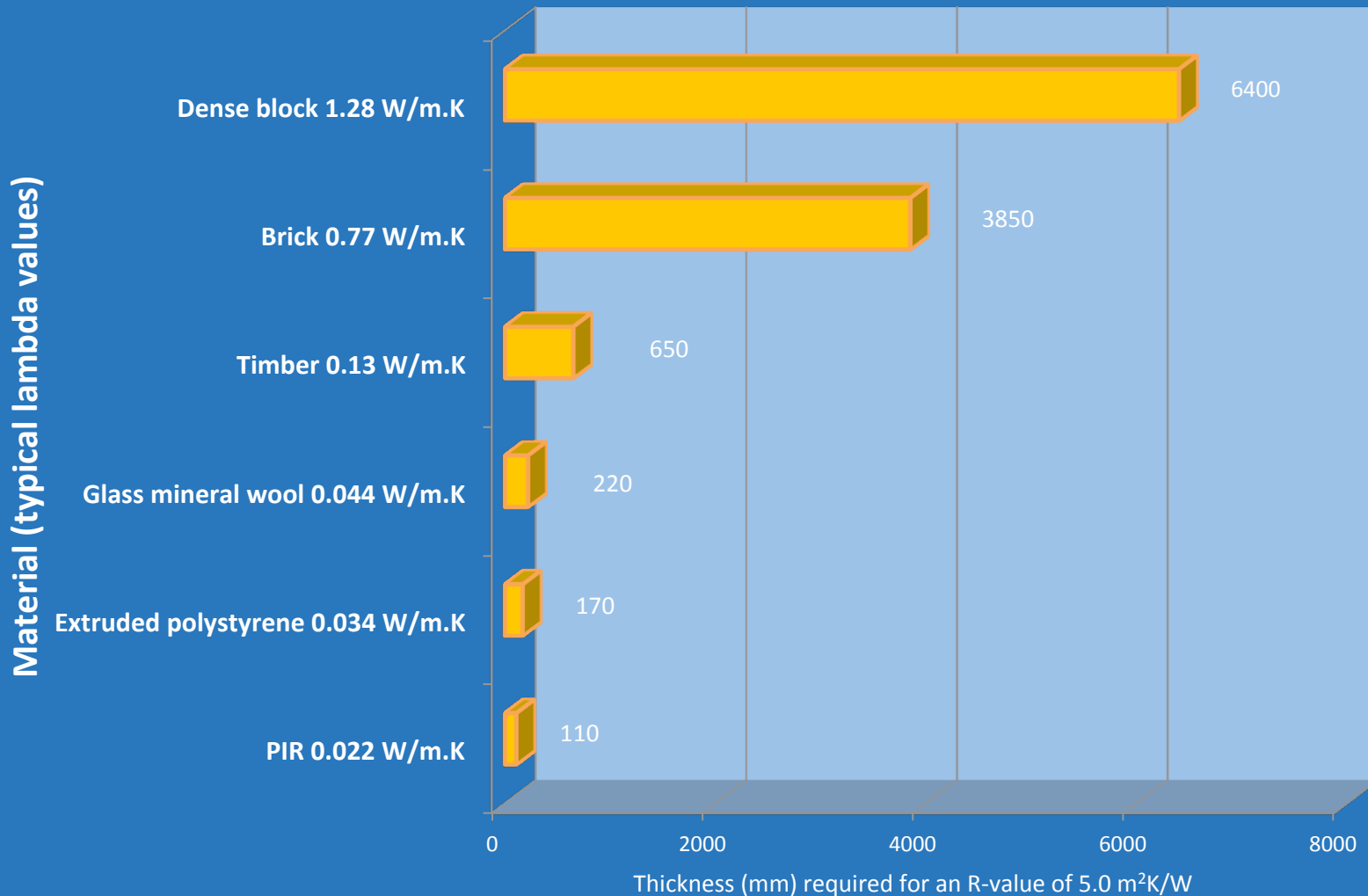
Refurbishment Trigger Points



Further Challenges

- Public Awareness and suspicion
- Changes/inconsistencies in Government Policy
- Shortage of Skilled Labour in certain disciplines
- Financial incentives “patchy” and often difficult to access
- UK moves towards private rented sector
- Warranties on products and workmanship - CIGA and SWIGA

Modern Insulation types compared to achieve R value of 5



Case study 1 – Nottingham City Homes

The issues

- 29,000 social housing units which did not meet current Building Regulations or Decent Homes Standard
- The majority of these of solid wall construction





The solution

- Trial analysis carried out before scaling up the project
- A range of PIR insulation products used in the project
- Insulation all applied internally
- Other measures applied at same time



The outcome

- Fully refurbished homes to Building Regulations levels
- Homes brought up to Decent Homes Standards
- Lower fuel bills for occupiers

Case study 2 – Rochdale high rise apartments

The issues:

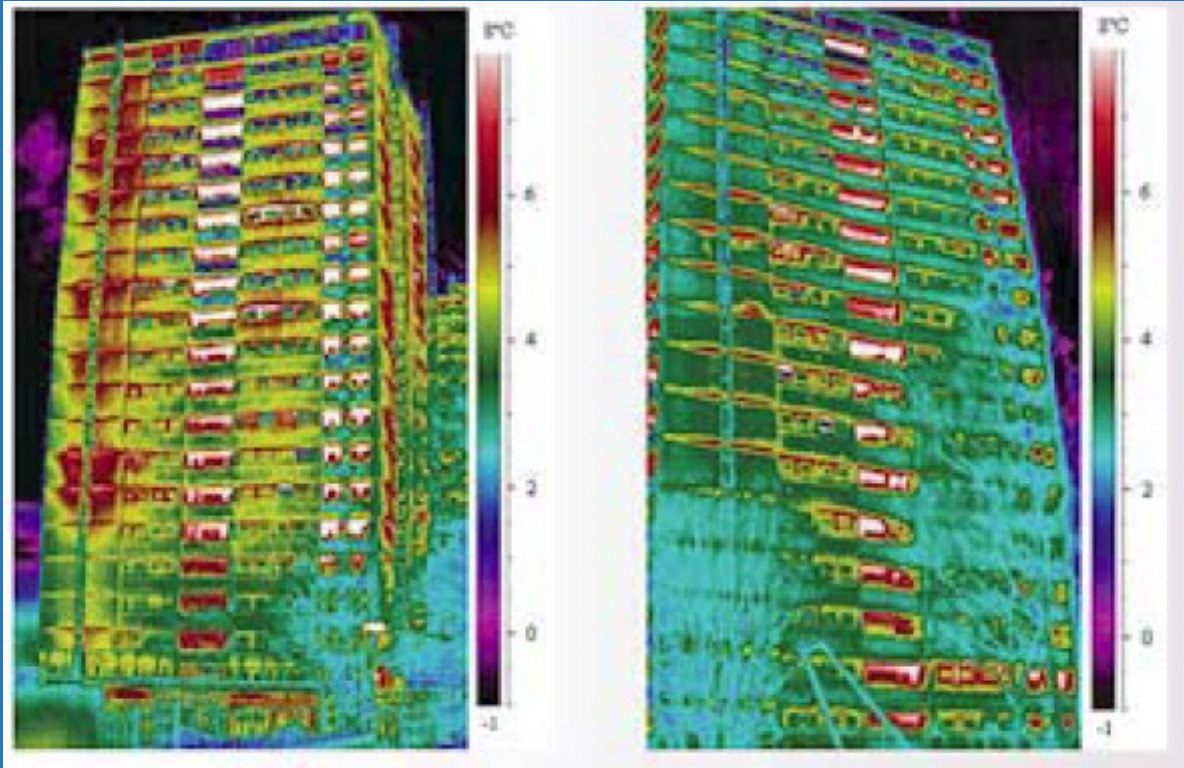
- 7 apartment blocks, 1960s construction
- No cavity wall insulation
- Wall tie corrosion due to wind driven rain
- Sub-50mm cavities (below the “norm”)



The solution

- Injected PUR system used to bond inner and outer leaves together and prevent driving rain
- Minimal disruption to building occupiers
- Entire project completed in 7 months
- BBA Certification





Left – red and yellow areas show high heat loss

Right – Green and blue areas show low heat loss

The outcome

- The insulated blocks are saving around 448 tonnes of carbon every year over the lifetime of the building
- Reduced heating bills for occupiers

Case study 3 – External wall insulation

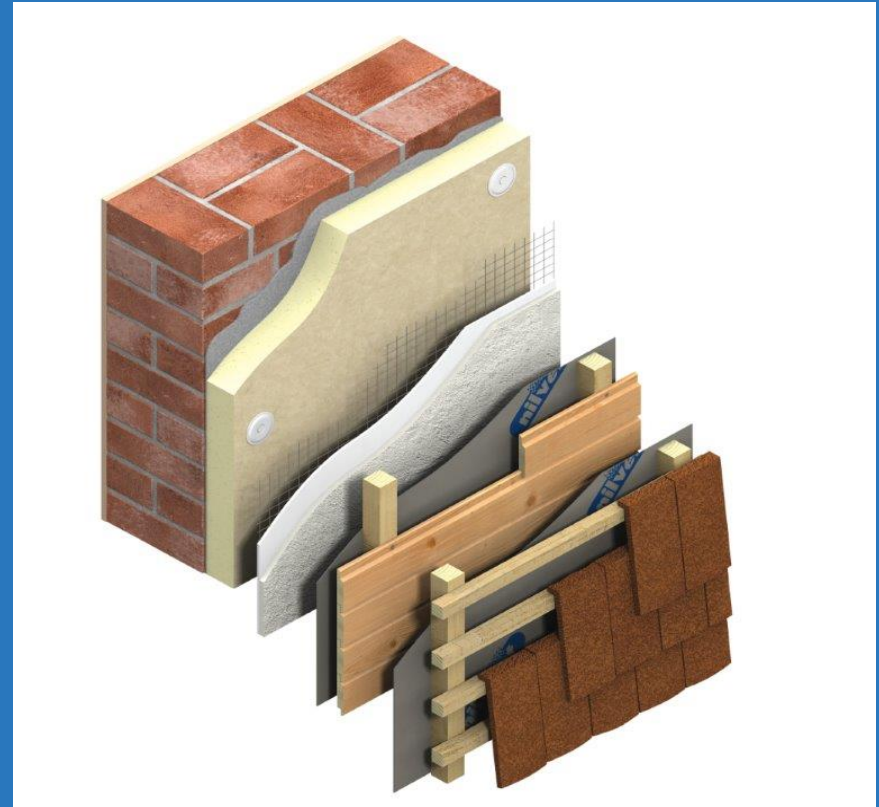
The issues:

- “REEMA” system Houses – uninsulated concrete housing
- Energy rating of “E”
- U-value of $2.34\text{W}/\text{m}^2\cdot\text{K}$
- Some properties owner occupied- mixed tenancy – some social some private



The solution

- Work with tenants and homeowners to come up with a community scheme
- External wall insulation added
- Minimal disruption to building occupiers
- Other measures at same time





- Work In Progress
- Use of multiple material types
- Other works scheduled at same time



The outcomes

- Heat loss reduced by a factor of 10
- Reduced heating bills for occupiers
- Improved aesthetics

Summary

- Technically – very few retrofit challenges that cannot be solved using modern insulation materials
- Innovation in insulation materials will lead to new possibilities and drive down costs
- UK Warranty Schemes such as CIGA and SWIGA will improve end user/consumer confidence
- Improvements in Installation capacity and quality required for External wall refurbishment

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