



## Plenary 3: Taking the risk out of retrofit

Speaker: **Peter Rickaby**, Rickaby Thompson Associates  
 Chaired by: **David Miller**  
 Room: **Ballroom**




National Housing Maintenance Forum



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## De-Risking Retrofit

**Dr Peter Rickaby**  
 Rickaby Thompson Associates

Supporting Sustainable Design, Construction and Retrofit

### Retrofit Forensics

- Pre- and post-retrofit testing
  - Pressure testing, thermography
- Post construction reviews
  - Detailed site inspections
- Post occupancy evaluation
  - Occupant interviews
- Monitoring and analysis
  - Fuel use, internal temperature and RH, internal air quality
- Defect investigation
  - Mostly condensation and ventilation problems
- '360 degree analysis'
  - Putting it all altogether and trying to make sense of it!

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### De-Risking Retrofit

- Why do retrofit projects rarely deliver the predicted cuts in fuel costs and emissions?
  - What contributes to the 'performance gap'?
- What are the risks of building-in defects?
  - How can we mitigate that those risks?
- What are the key points to watch out for?
  - At each stage of the retrofit process
- Focus on *low carbon* retrofit
  - Deep cuts in fuel costs and emissions
  - Retrofit plans integrated with asset management strategy
  - Not funding-led single-measure projects

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## De-Risking Retrofit

In theory, theory and practice are the same,  
 but in practice they are not

*Albert Einstein*

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### Where does retrofit go wrong?

- At the corners, junctions and edges
  - Where building elements meet and around openings
- At the interfaces between fabric and services
  - Matching systems to heat loss and air permeability
- At the interfaces between systems and people
  - Commissioning, handover, user understanding, control
- Retrofit defects are like building leaks
  - The consequences appear in unexpected places
  - Impacts on fabric, services, occupants, performance

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## Poor focus of QA systems

- Green Deal/ECO QA system based on PAS 2030
  - Aggregation of industry-based training schemes
    - Preserves fragmentation of retrofit industry
  - Focus on improving individual elements
    - But not on the junctions between them
  - Focus on installing systems correctly
    - But not on the interfaces with fabric and people

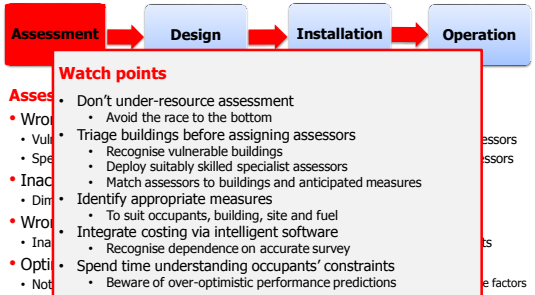
## De-Risking Retrofit

- Retrofit is a risky business
  - Technical, commercial and behavioural risks
  - Poor risk management delivers unexpected outcomes
    - Poor energy performance (less than anticipated savings)
    - Condensation, mould growth, fabric deterioration
    - Summer overheating
    - Diminished customer satisfaction
    - Erosion of profit and reputation
- Where are the risks?
  - Understand the retrofit process
- How do we mitigate them?
  - Modify and strengthen the process

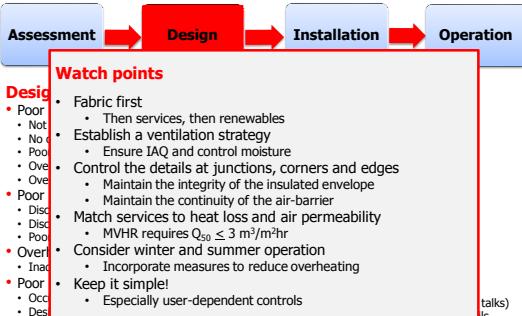
## Retrofit Process



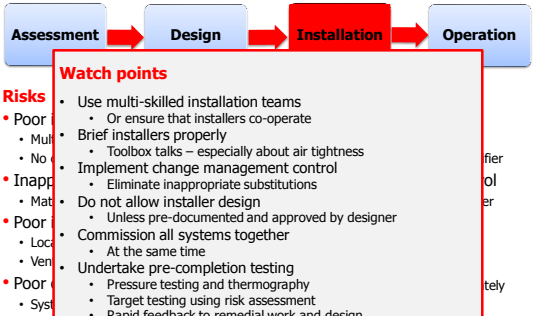
## Retrofit Risks

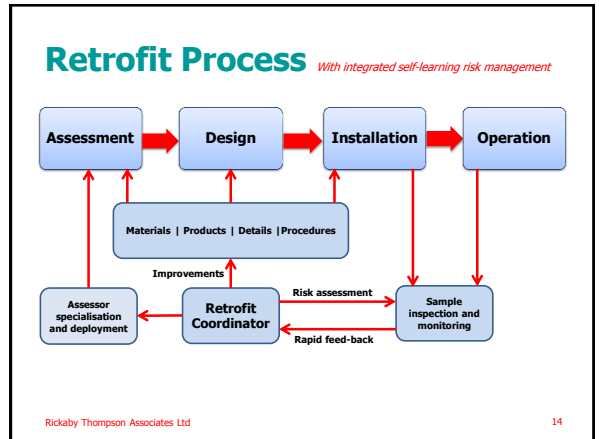
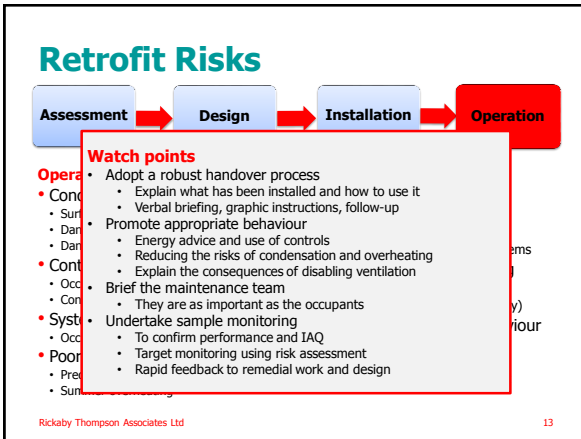


## Retrofit Risks



## Retrofit Risks





- ### Retrofit Coordinator
- Expert retrofit project manager
    - Trained and certified by CoRE
      - CoRE Diploma in Retrofit
      - Qualification endorsed and promoted by RIBA
  - Over-arching coordination role
    - Assessment
    - Design and specification
    - Installation
    - Quality assurance
    - Customer care
  - The best way to de-risk retrofit!
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### De-Risking Retrofit

Good retrofit comes from experience,  
and experience comes from bad retrofit

*So don't just publish the good news and ignore the bad !*

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CONSULTANTS

## De-Risking Retrofit

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