



# Costs, opportunities, risks and rewards of housing retrofit

*Gavin Killip*

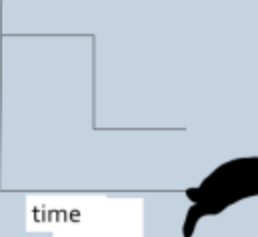


# What is retrofit?

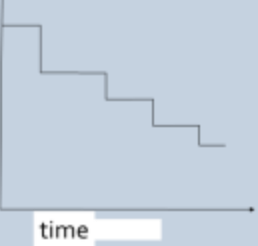


# Approaches to retrofit

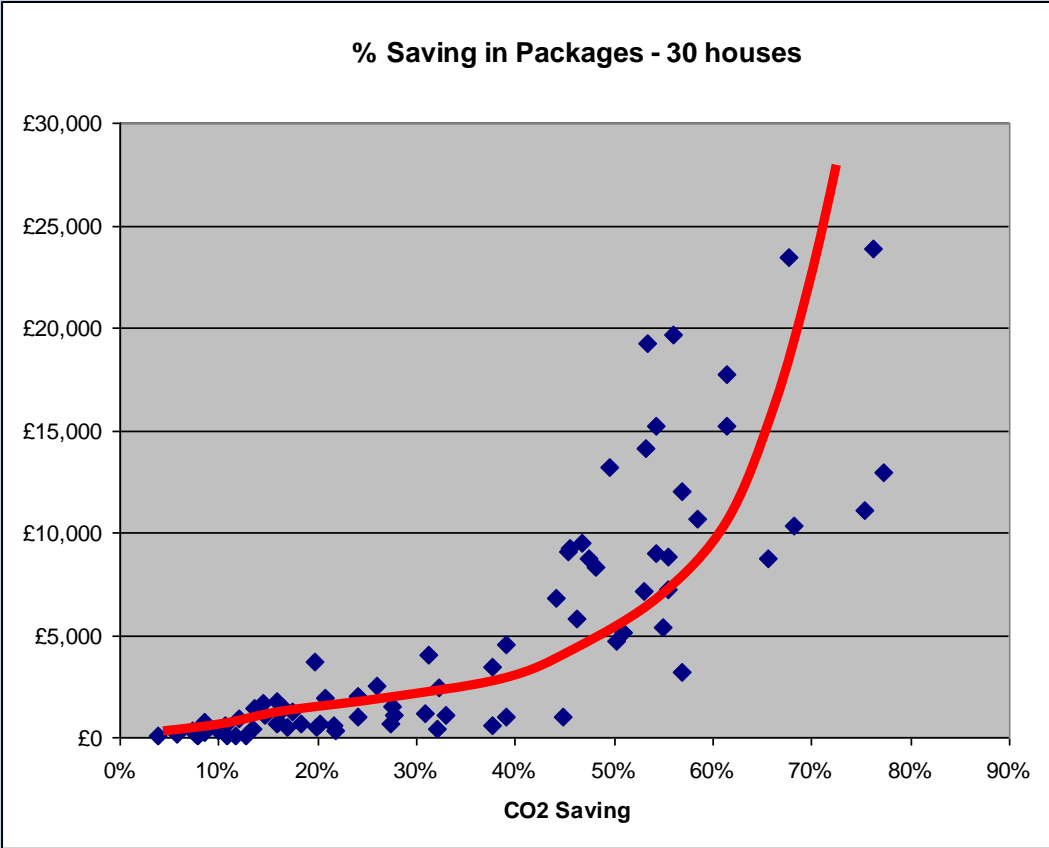
**Hare:** complete renovation at one time



**Tortoise:** extended, staged renovation



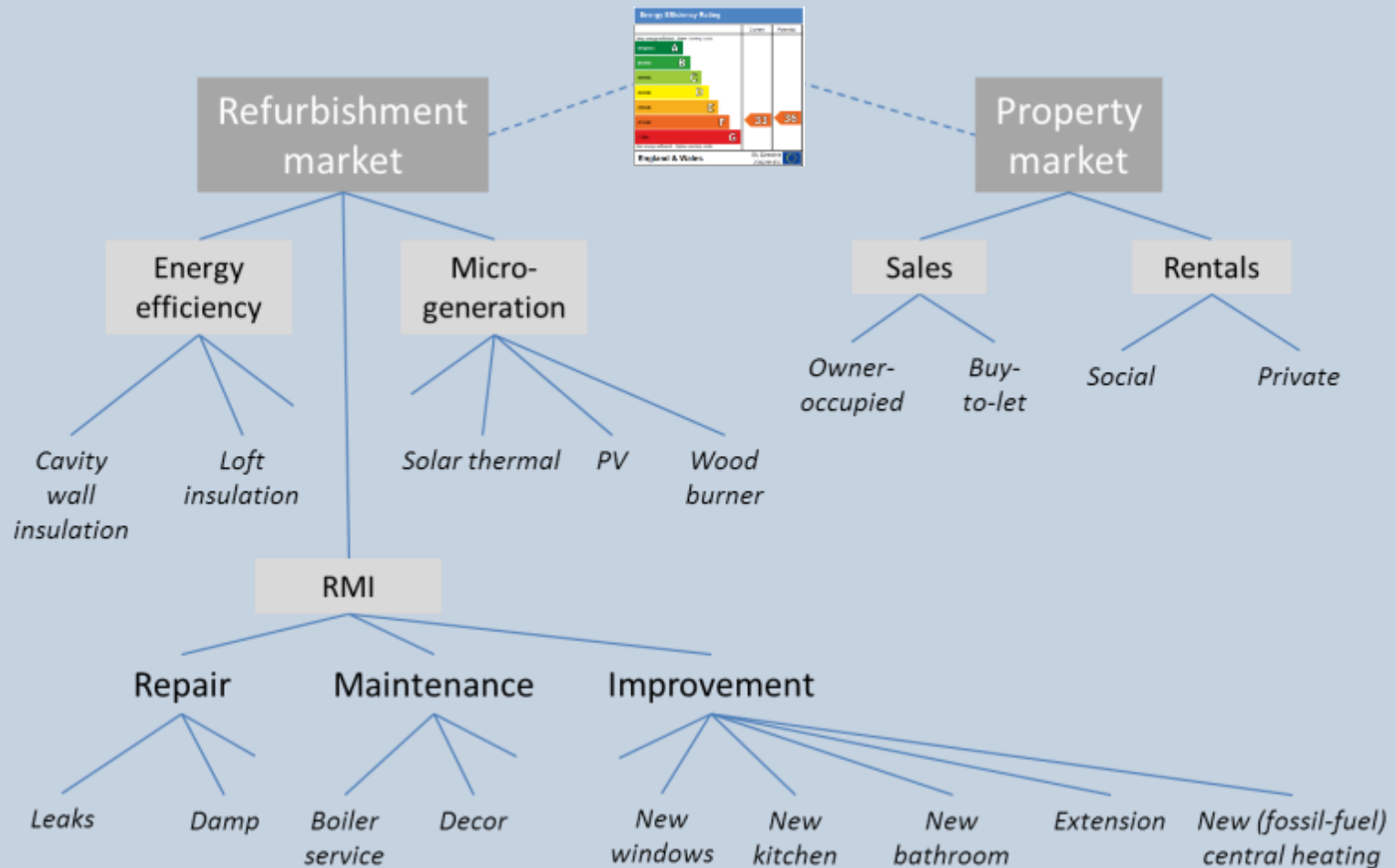
# Costs and standards



# Tensions between technical potential and market potential

<b>~60% reductions</b>	<b>~90% reductions</b>
Less technically difficult	More technically difficult
More affordable costs	Costs much higher
'whole home' and 'over time' models	'whole home' model only
Fits with a model of future change/ repair and improvement	Assumes a 'once and for all' approach
More market opportunities ... but how to ensure quality?	More specialist market ... but how to achieve scale?

# Markets and opportunities



# The construction industry operates at the right scale ...

Construction output by sub-sector, £bn (2010-15 averages)

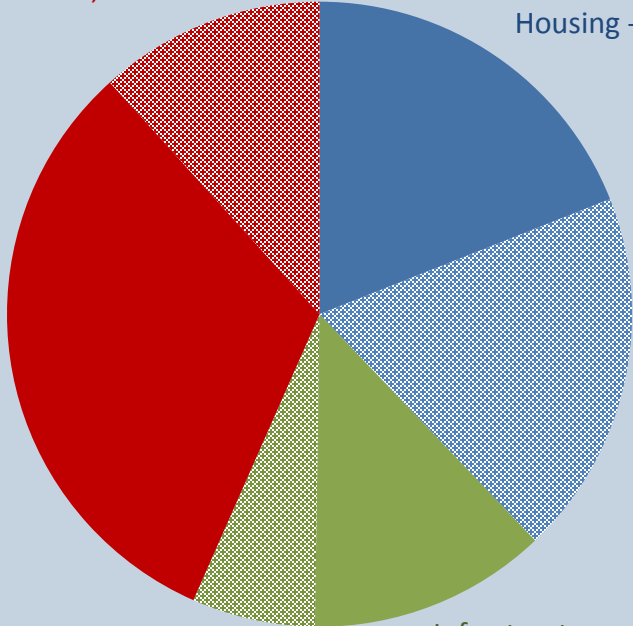


Industrial & commercial RMI, 14.7



Housing - new, 23.8

Industrial & commercial - new, 39.8



Housing RMI, 23.7

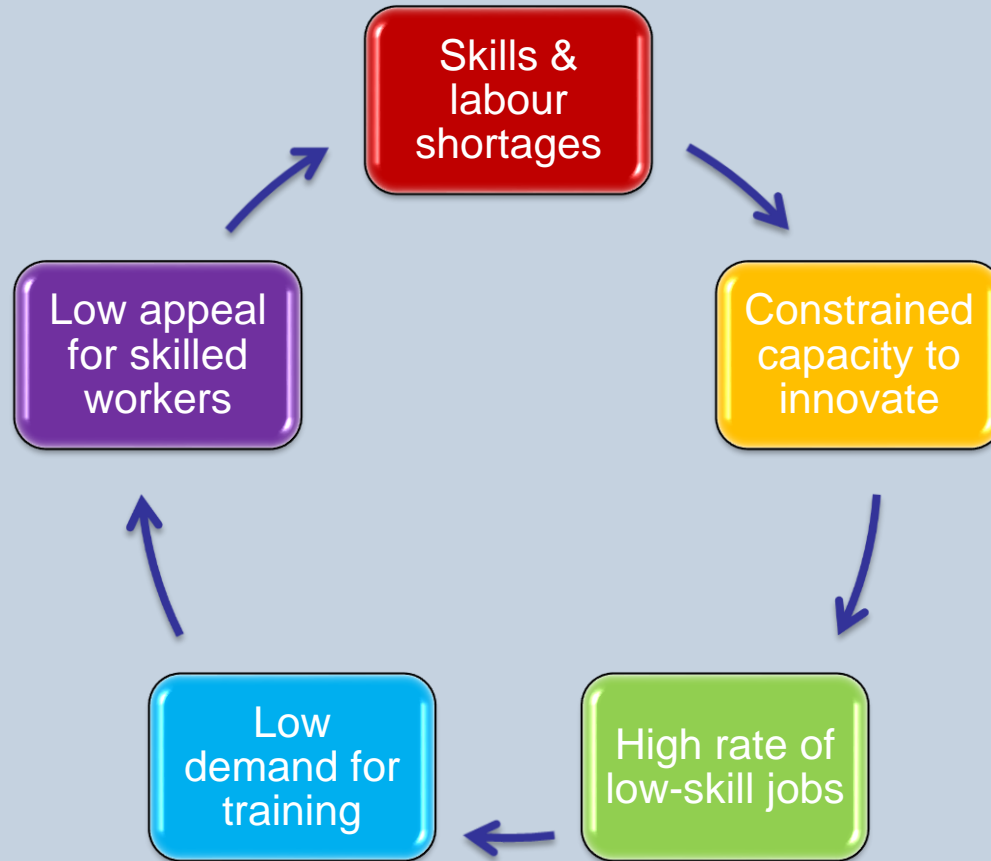


Infrastructure RMI, 8.0

Infrastructure - new, 15.5

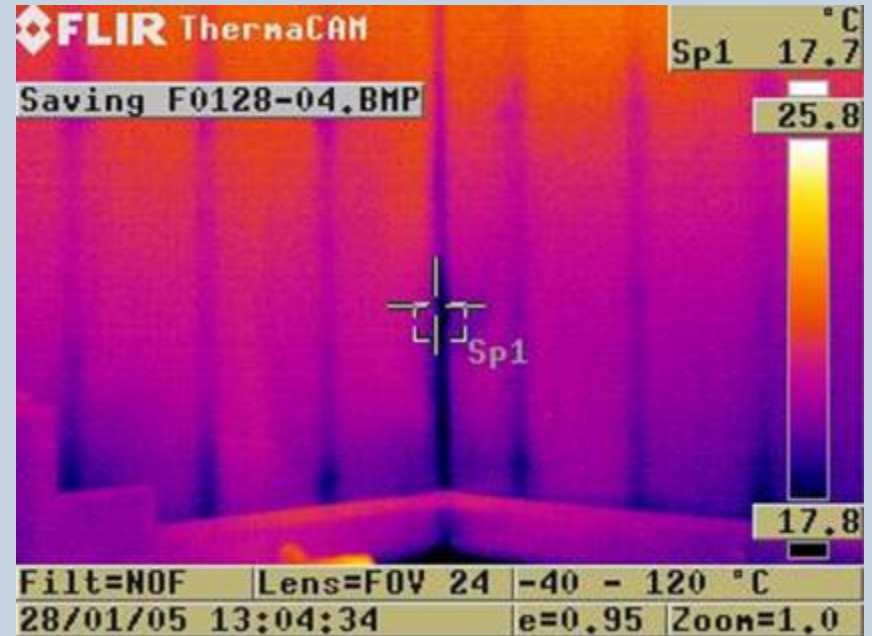


... but not with the right quality





# Risks of doing it wrong



Poor energy performance

Moisture damage to buildings over time

# Rewards for getting it right

## For occupants

- Comfort
- Well-being
- Improved health



## For retrofit businesses

- Bigger projects
- 'Up-selling'
- Loyal customers

# Access to capital

- Funding is needed for retrofit costs (at least initially)
- Timing matters:
  - fund the work when the costs are marginal
  - funding delays can halt a project
- New business models can use incentives to ‘up sell’



# Business model innovations

- Organisation of SMEs into co-operatives for retrofit
  - Flexible, multi-skill teams
  - Technical and project management training
  - Centralised functions for technical support and marketing
  - Making best use of financial incentives (where they exist)
  - Monitoring as part of a customer offer (guarantee?)
- Off-site construction techniques (eg Energiesprong)
  - Factory-based quality control
  - Surveys and on-site assembly still need to be done to high standards
  - May not work for all existing buildings (eg access, complexity)
  - Approach more suited to new construction than retrofit?

# Project coordination & integration

*‘[having a project manager] makes the job easier and cheaper ... we need these project managers on site to make these things happen. On every job I think they would pay for themselves’.*

*‘Le temps qu’on perd à s’adapter en cours de chantier, on aurait passé moins de temps si on l’avait étudié correctement au départ. Mais ça, on a beau leur dire’*

# What is an integrator?





# Lessons for policy

- Retrofit is not (just) an energy problem
- Much more serious engagement is needed with the construction sector
- Access to capital is an issue but ... a narrow focus on costs is not sufficient
- Skills, knowledge and new business models are all necessary
- We need innovation in process and practices, not just products

# A way forward: coordinated field trials

- Work to stretching performance standards
- Test innovations in real-world settings:
  - Technology performance
  - Team performance
  - Skills and knowledge
  - Budget
  - Experience curves (getting better and quicker over time)
- Broad partnership needed: industry, policy, research
- Initial budget ~10m euros ?
- Recycle funds from property sales



Thank you.  
Comments or questions?

[gavin.killip@eci.ox.ac.uk](mailto:gavin.killip@eci.ox.ac.uk)  
[www.eci.ox.ac.uk/people/gkillip.html](http://www.eci.ox.ac.uk/people/gkillip.html)



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