

# Retrofit solid wall buildings: carbon costs and savings

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# Presentation overview



- Introduction and background
- Multiple barriers to installing solid-walled insulation
- Methodology
- Four insulation options
- Results and discussion
- Conclusions



# Introduction and background

Buildings account for close to 40% of energy use (IEA, 2006)

31% of existing UK dwellings have un-insulated solid walls  
(DEFRA, BRE, & Energy Saving Trust, 2008)



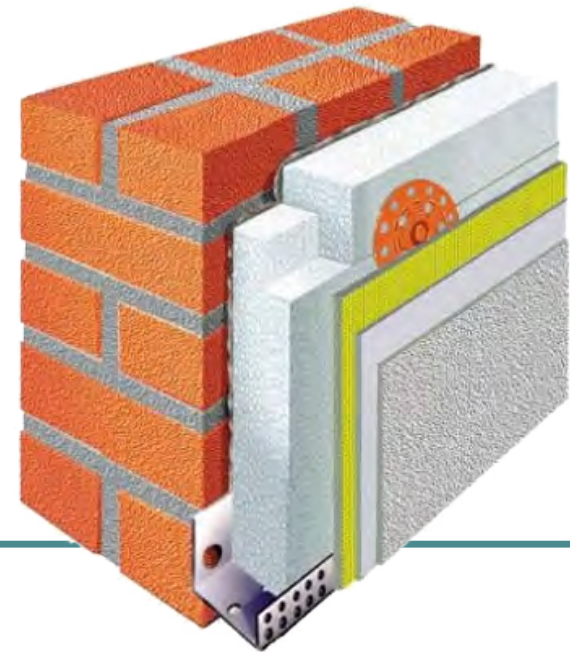
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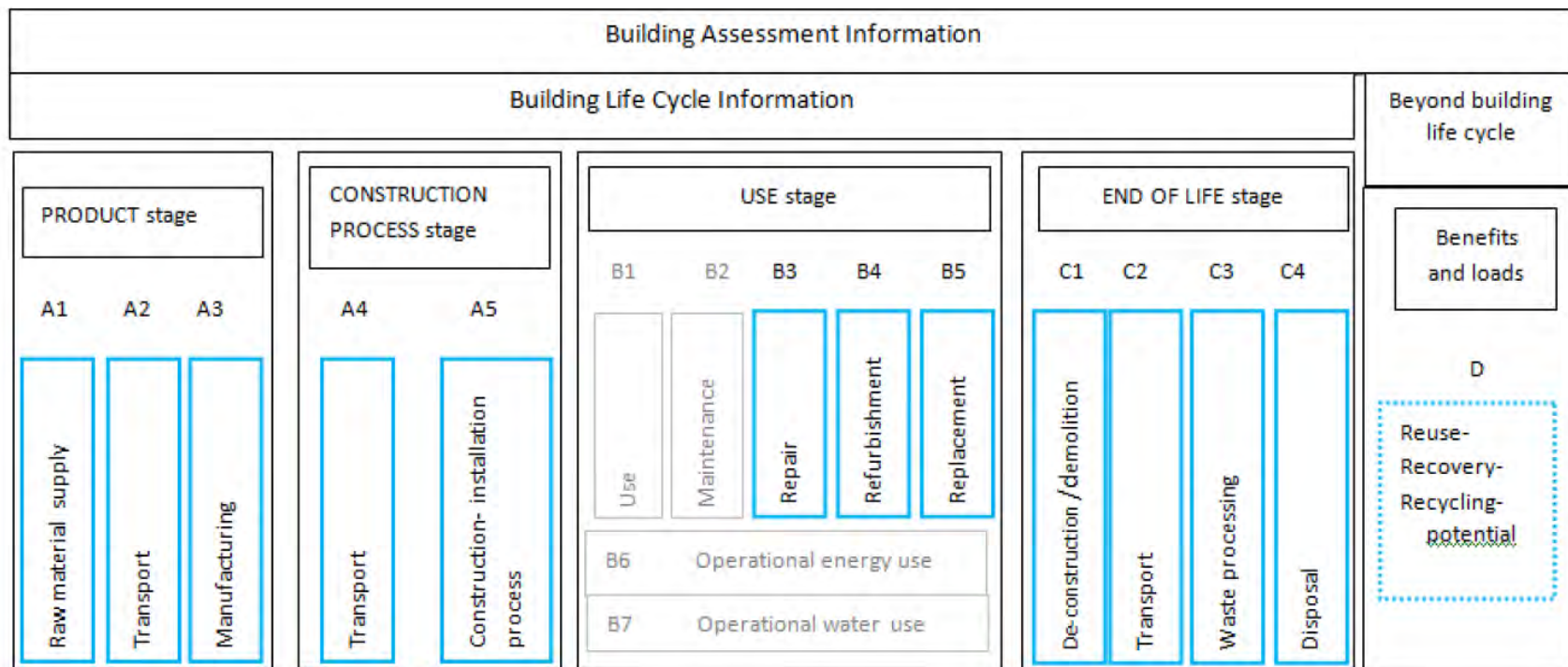
# Multiple barriers to installing solid-walled insulation

- Technological
- Economic
- Social/behavioural
- Lack of knowledge/awareness





# Life cycle stages from BS EN 15978: 2011 Sustainability of Construction works - Assessment of environmental performance of buildings - Calculation method



# Methodology

Butterfly software

“Cradle to grave” embodied energy, carbon for the building

SAP: operational energy and carbon



# Four insulation options

Mineral base

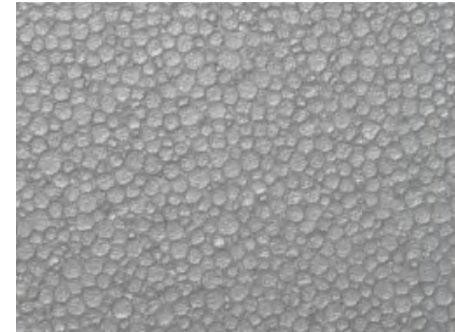
**Option 1: ThermoShell rock mineral wool (External use)**



**Option 2: OPTIMA system with ISOVER glass wool product (Internal use)**



**Option 3: ThermoShell EPS Board (External use)**



**Option 4: Speedline Thermal Laminate Plasterboard (Internal use)**



Oil-derived



# Results and discussions 1

U-value (W/m <sup>2</sup> K)	Description	Operational carbon (regulated) (tCO <sub>2</sub> e/yr)	Total embodied carbon (tCO <sub>2</sub> e)	Relative embodied carbon (tCO <sub>2</sub> e)	Payback (months)
2.09	Solid wall, no insulation	3.93	33.23	-	-
0.29	Option 1	2.36	34.41	1.18	9.0
0.28	Option 2	2.35	34.65	1.42	10.8
0.26	Option 3	2.33	34.56	1.33	10.0
0.20	Option 4	2.27	35.07	1.84	13.3
0.25	Cavity brick and block with 100mm cavity fill mineral wool insulation	2.32	32.31	-0.92	





# Results and discussions 2

Low initial embodied carbon

Long product lifetime

No reinstallation costs

**46.6 tCO<sub>2</sub>e savings in 30 years**



# Conclusions

Similar embodied carbon of the four products chosen.

Choice of product dependent on other issues.

Encourage retrofit insulation of solid wall buildings.



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# Thank you



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