

UCL



Change the



Where can I find out more?

- WRAP: www.wrap.org.uk/resource-efficient-built-environment
- Green Building Council : www.ukgbc.org
- Embodied Water: www.angelamorelli.com/water
- UCL Policy briefing [with hyperlink]
- UCL Technical report [with hyperlink]

This factsheet is one of a series produced by University College London. Other factsheets in the series are:

- 1 Lifespans & Decisions
- 2 Health & Well-being

Example case

Name of Estate	Borough Grove
Location	Petersfield, Hampshire
Local Authority	Drum Housing Association
Year	2009
Developer	Radian
Number of units	14 semi-detached homes
Age and type of building	1950s, precast reinforced concrete
Source of data	Radian

What is included?

- LGV & HGV Deliveries of materials and removal of waste
- Materials (incl. foundations, drainage, excavation of top soil, construction of roads and pavements, external walls, roofing materials, cladding, flooring, insulation, finishes, services)
- Site energy consumption during refurbishment
- Landfilled waste

What is excluded?

- Contractors' travel to and from site to work on the refurbishment
- Replacing systems and equipment within the next 50 years (building life span)
- Decommissioning building at end of life
- Embodied carbon of 1950s construction process

Final totals

- Retrofit cost: £91 900 per building (including decanting residents & staff costs)
- Life time emissions: 140.8 tonnes of carbon dioxide equivalent (tCO₂e) over 50 years
- Life time emissions savings: 230 tons of carbon (compared to non-retrofit)
- Cost per ton of emissions savings: £399

Retrofitting compared to demolition and rebuilding new, low energy homes

- Rebuild cost: £144 700 (£52 800 more than retrofit)
- Life time emissions: 151.2 tCO₂e (emissions 6% more than retrofit)
- Life time emissions savings: 209 tCO₂e (savings 9% less than retrofit)
- Cost per ton of emissions savings: £629 (cost £230 more than retrofit)

These estimates depend on the specific characteristics of this project

– the age and efficiency of the housing. Different projects would have different figures for costs and savings.