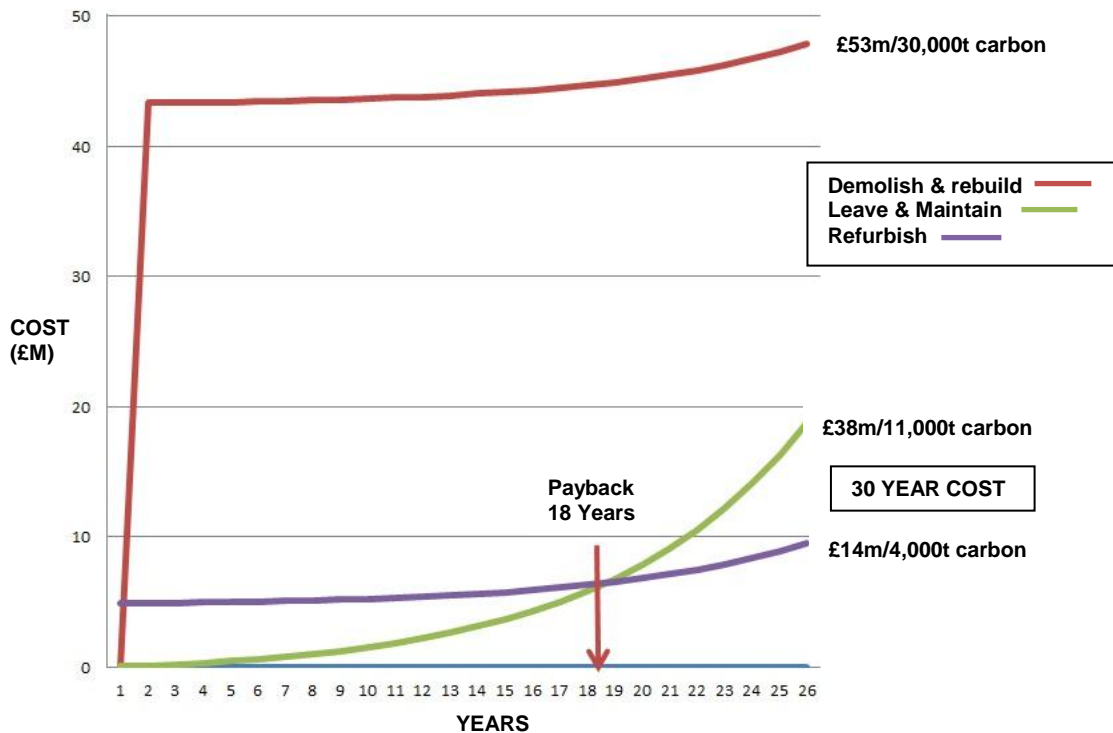


**LIVERPOOL JOHN MOORES UNIVERSITY  
WHOLE-LIFE AND CARBON COST ANALYSIS 27/11/09**



This Figure shows options for an existing 1960's, single-glazed, educational building providing approximately 22,000m<sup>2</sup> of gross internal accommodation.

**LEAVE AND MAINTAIN** —————

With heating bills currently at £83k p.a. rising at 15% p.a. and maintenance bills of £11k p.a. rising at 12% p.a., the 30-year projected heating, boiler repair and external fabric maintenance cost is estimated at c.£38m. This cost of energy converts directly to 11,000 tonnes of carbon.

**DEMOLISH AND REBUILD** —————

The capital cost of rebuilding is estimated to be £2,000/m<sup>2</sup> or £44m. The 30-year whole-life cost including rising heating energy costs, a super-energy-efficient maintenance-free facade but excluding decant/disruption costs and interest was estimated to be c.£53m. The carbon equivalent is 30,000 tonnes.

**REFURBISH** —————

The capital cost of overcladding is under £5m. The existing building is fully protected thereby arresting decay and extending the building's life. The 30-year whole-life-cost including rising energy costs and a super-energy-efficient maintenance-free facade with performance equal to a new new-build is estimated to be c.£14m. A carbon-equivalent of only 4,000 tonnes.

**CONCLUSIONS:**

1. We cannot afford, financially or environmentally, to rebuild or to leave and maintain.
2. The most economic and sustainable option is clearly to overclad.
3. The social benefits gained from the newly-overclad building will secure long-term demand for the quality accommodation provided.