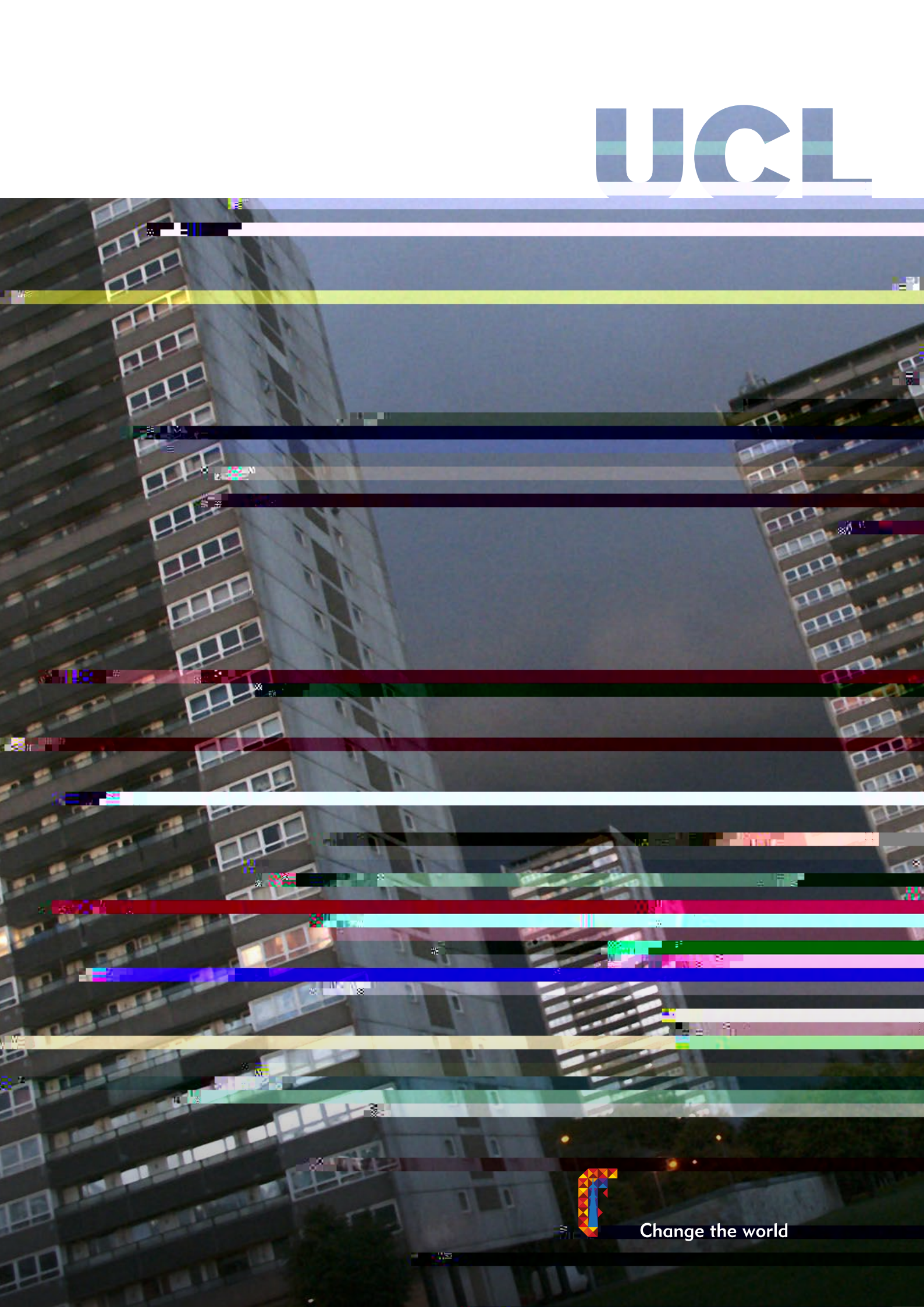
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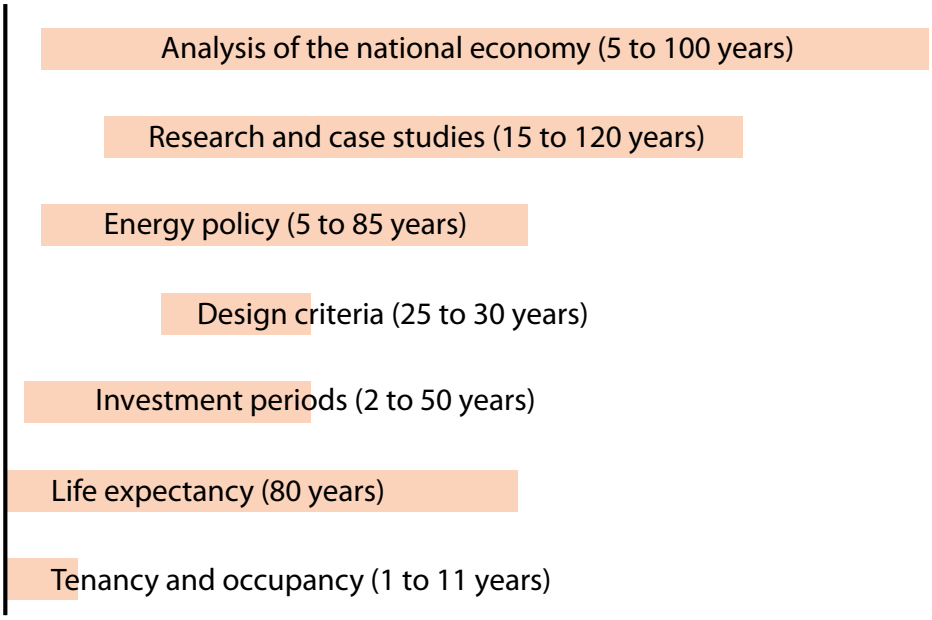
W l ?

The lifetime of a building is how long it lasts from when it is first built to when it is replaced. Within this there maybe a shorter period of:

- economic life: ends when the building is judged to no longer be the least expensive way of performing its function
- service life: ends when the building is judged to no longer perform as intended
-

Time horizons for buildings seen by di□erent people involved in housing decisions (years)



This diagram shows the di□erent lifespans of buildings considered by di□erent people involved in housing decisions.
The social, environmental and economic costs and benefits of refurbishment, demolition and new construction vary and occur at different moments for different stakeholders.

T I I I I I

Comparison of carbon emissions, energy costs and construction costs for different options over the same lifetime (often about 30 years)

Comparison of carbon emissions, energy costs and construction costs for different options over different lifetimes recognising that buildings can last longer than 30 years

R I I

Building lifespans used in energy, carbon and cost calculations are not always consistent. This is important because small differences in projected lifespan can make a big difference to the estimates. It should always be clear in reports what period is assumed and what difference a change in this assumption makes to the recommendations

S

- Ask what is included and what is excluded in the calculations?
- Ask about the assumptions behind the calculations, especially building lifespan and energy prices?
- Ask how well the calculations match real-life measurements, bills or monitoring?
- Ask how well the results compare with similar projects?
- Ask what difference it makes to any recommendations if you change each assumption in turn?

W I ?

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

1 **Embodied Carbon**

2 **Health & Well-being**

C I P L

The performance of a 'do nothing' scenario against refurbishment or against a 'demolition and new build' option is usually sensitive to assumptions about future prices and the building lifespan.

In an analysis of refurbishment in Clapham Park, London, one study (Sweetnam and Croxford 2011) found that modelling a shorter lifespan and assuming fixed future fuel prices favoured refurbishment because this involved smaller investments that paid back early in the lifecycle, within less than 30 years. This model included embodied and operational energy and carbon.

Over a lifespan of 60 years, in a scenario with rising fuel prices, refurbishment was about on a par with new build, although the costs of demolition and decanting were not included. Including these costs would improve the case for refurbishment.

It was only over a 90 year period with rising fuel prices that the model started to favour rebuilding over refurbishment. Again, the costs of demolition and decanting were not included. If they were included, it would take longer for the model to favour the rebuilding option.

When inflation is low, simple financial models favour low cost measures (now) that achieved modest savings (soon). Similarly, from the perspective of residents, especially tenants on short term tenancies, measures that cause the least disruption and deliver immediate savings are likely to be preferable.

Other factors come in to play in the short term. If land and building values are rising fast in the short term or much faster than energy prices, the returns from investing in an energy efficient refurbishment will be dwarfed by the returns from investing in increasing the floor space available to sell or let by demolishing housing and redeveloping more units on the same area of land.