

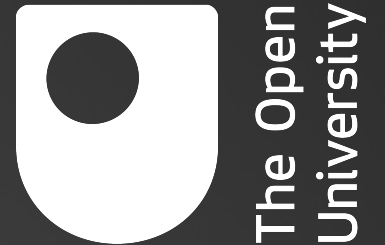
Reducing carbon emissions from residential heritage buildings while retaining their heritage values

The Problem: We must urgently reduce carbon emissions to help mitigate the effects of climate change. The building sector accounts for over a third of UK emissions each year, the majority from existing buildings. Up to 20% of UK buildings are heritage buildings. They shape the character of our urban and rural areas but because of their historic values and traditional construction techniques they are particularly challenging buildings for carbon reduction.

Research Aims: I'm exploring ways to reduce carbon and retain history, investigating three poorly understood but key areas:

1. Residents opinions of the heritage values of their buildings and what changes they would find acceptable
2. The energy behaviours of residents
3. The carbon savings of different options and the carbon cost (embodied carbon) to manufacture, transport and install them

I'm focussing on Cumbria and the Lake District National Park which have a high proportion of heritage buildings.



An example of a Cumbrian Heritage Building

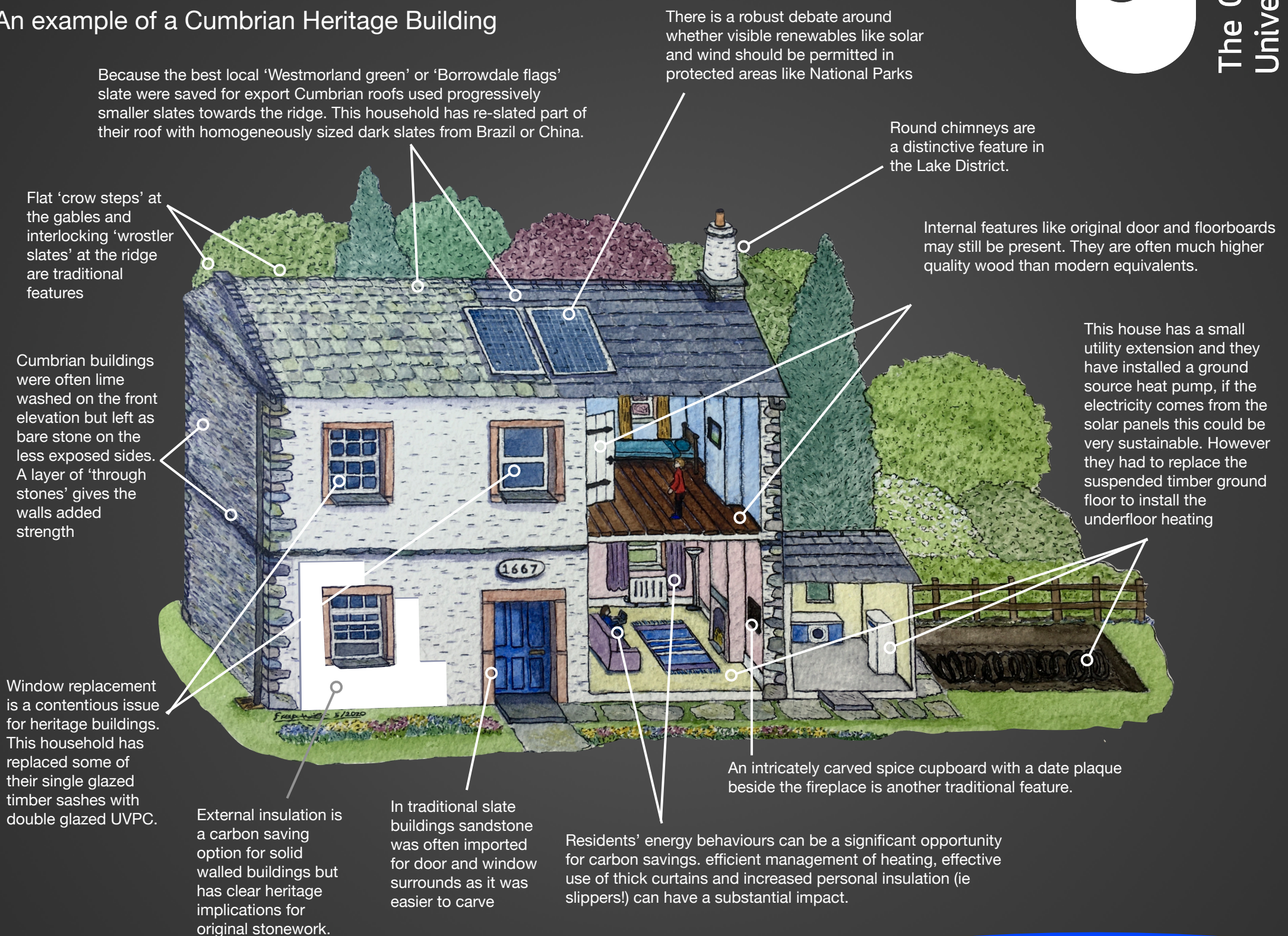


Image from original painting by Freya Wise

Freya Wise
Department of Engineering
and Innovation
The Open University

Methods:

- Online survey of Cumbrian heritage building residents
- Case studies involving; interviews, building walkthroughs and energy diaries.
- Energy modelling of case study buildings and lifecycle analysis to explore the carbon costs and savings of different options.

Results so far:

1. Residents value the traditional construction, local materials and character of their heritage buildings in the landscape. They dislike changes effecting the building's exterior but are more positive on renewable energy technologies such as solar panels.
2. Most heritage building residents engage in positive energy behaviours such as wearing slippers, putting on more layers rather than turning up the heating and only heating actively used areas of their houses.
3. Embodied carbon must be considered and can effect whether an option actually saves carbon or not, UVPC window replacements are particularly dubious for both carbon savings and heritage values.

Implications: This research will help identify appropriate ways to reduce carbon while retaining history and will inform policy.