Reducing the conflict between energy retrofit and heritage character

September 24 2018, by Reyyan S. Okutan, Prof. David Coley, Manuel Herrera Fernandez, Tristan Kershaw

Retrofitting historical buildings without impacting on their appearance and heritage presents a significant challenge. The Royal Crescent, Bath. Credit: Edwin Smith, RIBA Collections

Buildings represent the largest single source of greenhouse gas emissions

from the developed world, and climate change probably the greatest threat to humanity.

This places a considerable ethical weight upon the shoulders of all those involved in sustainable development.

Although the design of new zero-energy buildings is possible, the bulk of buildings are pre-existing and form the backdrop to urban and rural lives.

The visual change implied by deep energy retrofit of such buildings is therefore controversial, and possibly based on an orthogonal view of sustainability, yet, unless some way is found to retrofit these buildings, it is unlikely we can reduce emissions quickly enough to avoid permanent harm to the biosphere.

The most controversial will be the retrofit of buildings of historic importance—and hence these provide an ideal test bed for research into a solution. In this work, we introduce a novel socio-mathematical method to eliminate the orthogonality.

Firstly, we suggest that the public need to be part of the solution. Secondly, we present a new way of garnering views about the acceptability of retrofit measures. Thirdly, the public's ranking of the acceptability of the measures with respect to heritage impact is compared to a ranking of the energy saving given by the measures.

It is found that measures that present greater energy savings are not de facto more intrusive, and that there is the potential for a constructive dialogue between those inspired by a conservation agenda and those targeting carbon savings.

Finally, by using a Pareto Front approach, a new theory is developed of

how to identify measures that are sensible in the eyes of both parties. This new four-stage process will be of use to those attempting to resolve such conflicts or set national guidance.

Provided by University of Bath