

Domestic low-carbon retrofit

The UK Government sees domestic low carbon retrofit (retrofitting existing homes with energy efficiency measures and low carbon technologies) as a key instrument for achieving its target of an 80% reduction in CO₂ emissions by 2050. However, the challenge is formidable, and equates to having to treat 12,500 homes for improved energy efficiency each week, every week, for the full 40 years to 2050.

Existing homes have been little impacted by climate change policy and regulation updates. However, with the Household Energy Management Strategy, published in early 2010, the government articulated its proposals for tackling climate change and energy security in the context of existing homes. The proposals outlined will largely be implemented through the Green Deal and a new micro-generation strategy. This should see extra advice provision, new standards for upgrades, installations and service providers, with further obligations on energy companies, and the introduction of Pay As You Save financing; initiatives that are building upon the experience of a series of pilot and research projects that are helping to develop the necessary knowledge, skills, practical experience and market stimulus necessary for large scale implementation.

Projects such as the TSB's Retrofit for the Future are proving that, of course, the devil is in the detail. In seeking opportunities to minimise transmission and ventilation losses; manage internal and solar gains; supply energy efficiently; and control overheating and comfort, whilst accounting for a myriad of constraints, including: location; orientation; construction type and quality; layout; internal/external space; existing services; architectural/social context; and of course building occupants, retrofits present complex and multifaceted projects that require an appreciation of context as well as detailed technical understanding.

In seeking to achieve substantial, cost effective and long term carbon savings there is no one-size-fits-all solution. Whether delivered at community scale or on an individual home, adopting a whole-house or stepwise approach, if solutions are to be effective in saving carbon, and as a sound investment opportunity, they must be informed by practical experience and robust qualitative and quantitative performance data. Innovative technologies can play a role, but progress will depend on how effectively basic principles and current technologies can be presented in design, delivered in construction, and managed in operation.

Michael Birnie, 15 February 2011

Key issues

- Gain a good understanding of the dwelling, its context, and occupancy characteristics; accurate surveying and early engagement with planning authorities and occupants will help to realise effective solutions and avoid wasted design effort.
- Investigate scale-up opportunities; look to maximise time/resources on site, talk with neighbours, review neighbouring sites/developments for expansion of works or integration of infrastructure.
- Evaluate cost-optimal retrofit levels; review against "anyway-investments", use accurate life-time projections.
- Focus on simple, robust, and proven no-to-low maintenance solutions; overly complex options may be difficult to install and a burden to operate and maintain.
- Account for occupant comfort; ensure that retrofit measures don't compromise wellbeing.

Web links

DECC Annual Energy Statement (www.decc.gov.uk/en/content/cms/what_we_do/uk_supply/aes/aes.aspx)

Green Deal (http://www.decc.gov.uk/en/content/cms/what_we_do/consumers/green_deal/green_deal.aspx)

Low-energy buildings database (www.retrofitforthefuture.org)

Retrofit and Replicate (http://www.hyde-housing.co.uk/client_files/aboutus/RetrofitandReplicateProject.pdf)

Low-energy Victorian house (www.levh.org.uk)

Energy Saving Trust: Area-based energy efficiency

(www.energysavingtrust.org.uk/business/Global-Data/Publications/Area-Based-Approach-Best-Practice-Guide)

Energy Saving Trust: For housing professionals (www.energysavingtrust.org.uk/business/Business/Housing-professionals)