



low-impact retrofitting



what is it?

Retrofitting is about existing buildings. Not everyone has the opportunity to build a natural home, but we can all take measures to upgrade an existing property - to improve comfort and performance, and reduce energy use and costs. What we're not talking about is a cosmetic / decor / style retrofit, e.g. replacing a bathroom or kitchen for the sake of it, or because the colour is wrong.

Key to a successful retrofit is considering the property as a whole and deciding on all the appropriate measures for that particular building. And of course the measures you choose will fall within your constraints of time, potential disruption, budget and ultimate aims.

There is a logical order to retrofitting, and although you don't have to stick to it rigidly, it makes sense to sort out repairs and insulation before you start thinking about installing solar panels, for example. This is our suggested order: design; repairs; breathability; damp; ventilation; airtightness; insulation (including loft, walls, floors and hot water cylinders); heating; lighting and appliances; energy generation.

Most people don't really understand the fabric of their buildings, so we tend to put all the responsibility for a retrofit onto the builder who gives the quote. It's good to have some knowledge beforehand, or you could spend more money than necessary and/or make the wrong decisions. Lack of understanding leaves you open to using materials that can cause damage.



The average home in the UK loses 30% of its heat through the building fabric, including roof, walls, windows and doors, and so by insulating and draughtproofing, it would be relatively easy to significantly reduce overall energy use and costs.

In post-war Britain, there was an explosion in petrochemical products. Pre-war homes tended to be draughty and damp, and plastics were seen as the solution - wonder products that were light, hard-wearing and waterproof. Petrochemical-based products such as vinyl paints and wallpapers, synthetic sealants and plastic sheeting were used to waterproof our homes, creating unhealthy internal environments due to condensation and mould. The synthetic measures didn't increase the comfort of the property, and created as many problems as they solved. Trapped moisture in houses is unhealthy for people, and moisture trapped in the fabric of the building is damaging for the building itself. Breathability and ventilation are essential ingredients of the retrofit concept. Without them, a building and its inhabitants will suffer. Petrochemical-based products prevent breathability. Also, in the past we have tended to prioritise total draught exclusion without giving enough consideration to ventilation.

what are the benefits?

- lower energy costs
- greater comfort
- healthier internal environment for you and your family
- protection of your property, so that it lasts much longer, and won't require expensive repairs in future
- reduced energy use, so lower emissions of carbon and pollutants (the vast majority of properties today will still be occupied in 50 years time, so we can't address overall carbon emissions just by focusing on new buildings)

A good, low-energy retrofit is part of an attitude that sees your property as a home, a positive space to share with your family and friends, rather than just a source of profit. By planning properly, and implementing the measures that you can, you get to understand your house, protect the fabric of the building, increase the comfort of day-to-day living and help to protect the natural environment.

what can I do?

First, learn about the fabric of your building. Talk to people, attend a course, read books, research online, learn about what it's made of, and how you can work with that to achieve your aims. Remind yourself of the original purpose of the building and adapt your behaviour accordingly.

Secondly, although the measures you carry out can range from behavioural changes to a total redesign and installation of new technologies, the



If you have a whole house retrofit plan, you can take opportunities as they arise - e.g. if you install a new hot water cylinder, make sure it's a twin-coil so that solar hot water can be connected to it when you're ready.

simpler measures can be very effective, even if you're a tenant. Simple measures include:

- removing non-breathable surfaces, e.g. vinyl wallpapers, vinyl silk paint, polystyrene etc.
- increasing ventilation in a bathroom or a room with condensation problems; this doesn't have to cost anything - it could be as easy as opening a window for 15 minutes a day, or it could involve installing a fan
- having showers instead of baths; getting rid of the tumble dryer
- heating the room before a shower (so moisture won't condense), and then opening the window afterwards (so that moist air can escape)
- reinstating / re-opening air bricks
- repairing chimney stacks
- fixing downpipes, clearing gutters - all the things that keep water hanging around
- heating each room independently by having thermostatic valves on all radiators
- turning thermostats down so that you're not wearing t-shirts in January; not leaving equipment on standby; buying energy-efficient appliances
- switching to a green electricity provider
- using natural, breathable paints

- reducing consumption - the benefits of other measures can be wiped out by purchasing lots of new, unnecessary equipment and fittings

Thirdly, create a 'whole house' retrofit plan, of all appropriate measures possible. Use professional help, especially if you're thinking of implementing structural changes, as mistakes can be costly and damage your property. This could be a builder, an architect, a surveyor or a consultant - someone with practical experience who understands the issues. It will take some work to find the right person - talk to neighbours or friends who've had work done, call the council helpline and ask for advice, check the AECB website, research online, check your local library / yellow pages.

Assess your plan in terms of time frame, disruption, cost and ultimate goals to create a project schedule. Then either obtain quotes to do the work, or training for DIY. You may not carry out all the work in one go, but at least any work will be part of an overall plan, and you can see if opportunities arise to carry out other work if there is disruption in a particular part of the house.

If you decide to pay for the work to be done, select your builder in the same way as you selected your advisor above (it may be the same person, or they may be able to recommend someone). But remember that you are project manager - start talking about your project and listen to their responses. Let them suggest solutions, and check them against your understanding of the issues outlined above. You are looking for technical expertise and practical skills, but if you are in a position of knowledge, you can interview people on competence rather than on just a quote.

resources

- lowimpact.org/retrofitting for more info, products & books, including:
- *Eco-house Manual*, Nigel Griffiths
- *Maintaining & Repairing Old Houses*, Bevis Claxton
- *Architectural Salvage*, Geoffrey West
- rethinkingrefurbishment.com - National Refurbishment Centre
- energysavingtrust.org.uk - Energy Saving Trust, advice on how to save energy and money
- aecb.net - directory of sustainable builders, architects and surveyors

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