



low-impact building



'The individual's desire to build something should not be deterred! Everyone should be able to build and thus be truly responsible for the four walls in which he lives. And one must take the risk into the bargain that such a fantastic structure might collapse later, and one should not and must not shrink from human sacrifice which this new mode of building demands. We must at last put a stop to having people move into their quarters like chickens and rabbits into their coops.' – Friedensreich Hundertwasser

what is it?

Apart from caves, all human habitation damages nature to some extent. Low-impact building is about minimising this damage.

Materials: can be manufactured / delivered, or natural / local. Natural materials include timber, clay, lime, earth, straw, hemp and stone. Bricks, cement, metal and plastic have a high impact, but are common because they're familiar, easy and quick to use. Reclaimed materials avoid the energy and waste associated with manufacture.

Size: the smaller the better. An unnecessarily large home can't really claim to be low-impact.

Energy & water efficiency: a low-impact building won't require much energy in its use. This can be achieved via passive solar gain, super-insulation, passive ventilation, no air conditioning and low-impact appliances. Consider these before energy generation. Water use can be minimised via water-saving devices, rainwater harvesting, greywater recycling, compost toilets and lifestyle change. The concept of eco-minimalism involves a restrained use of 'bolt-on' technologies and devices. With an appropriately-sized, well-designed, super-insulated house, plus energy and water-saving measures and appliances, you won't need so many extras.

Location: productive land is limited; large lawns or pony paddocks are a waste. A home for non-land workers will have a lower impact if it's in a town, close to jobs, shops and mains utilities.

Lifestyle: a low-impact home's benefits will be wiped out if you're a long-distance commuter, frequent flier or high consumer. And second homes are definitely not low-impact.

what are the benefits?

Environmental: construction causes c. 10% of energy use and CO₂ emissions, but the use of buildings is responsible for c. 50% – the majority for heating. Some materials are carbon negative – the carbon locked up in a log cabin is about twice as much as saved by a roof covered in photovoltaics used for 25 years! Natural materials tend to be hygroscopic – i.e. absorb and release

water, preventing moisture from becoming trapped in the building and causing decay. They can be repaired easily, so they can last a long time – often centuries. Local materials don't need much fuel for transport, and it's clear whether their extraction is being carried out sustainably.

Health: pollutants, (chemical and biological), have increased in homes since the 1970s, when lots of synthetic, non-breathable materials began to be used for insulation, draughtproofing and damp-proofing. Now the UK has one of the highest levels of asthma in the world – almost 10% of the population. Humidity levels of 40-60% are optimal for human health, and can be maintained by hygroscopic materials. Lots of toxic materials are used in high-volume construction – formaldehyde in boards, arsenic in preservatives and VOCs in paints. Natural alternatives are available.

Cost: real savings come with self-build, and with local, free (or low-cost) natural materials. 'Affordable housing' starts at £65k, but Simon Dale and Steve James built beautiful, unique homes for £3k and £4k, and there are many other examples. It can be done, if you can get past the planning system and building regs - written by the construction industry, who naturally enough, want to make money, supported by a government promoting economic growth.

Personal: unique, fun, and it's very satisfying to live in a house you've built yourself.

what can I do?

If you hire a builder, make sure you obtain references, and see previous work, but learn as much as you can, to retain control of the project. With a natural build, you may attract volunteers.

Funding: with a more conventional home, you'll probably need funding. We suggest that you go to a 'mutual'. The Ecology Building Society has a good track record of funding low-impact builds. Self-build mortgages are payable in stages, so finances are covered with less risk to the lender.



Self-build natural homes can allow you to indulge your creativity: unique not identikit.

low-impact building



lowimpact.org

Location: in a remote location, a building can only be considered low-impact if you remain 'off-grid' in terms of electricity, heating, water and sewage. If you don't want to be off-grid, and you don't need to use the land, choose an urban plot where mains utilities are already available.

Materials: the closer to nature, the lower the embodied energy and toxicity. Avoid concrete (inc. foundations – alternatives include car tyres with rammed earth, stone, flint & lime or brick/timber pillars); timber with toxic preservatives; uPVC; aluminium; and boards that contain formaldehyde. For finishes, choose natural paints and clay or lime plasters. Natural materials need a 'good hat & boots' – foundations that lift materials above the ground and a roof with a good overhang. For new-builds, builders will be zero-rated for VAT, and you can reclaim VAT on most building materials – keep receipts.

Design / planning the build: there are high-tech, multi-layered, complex wall systems, yet natural materials may be more insulating (especially straw-bales), and will usually be cheaper and more eco-friendly. High-tech systems may not be as 'eco' as energy-efficient appliances and more insulation. If you use an architect, talk to them about solar gain, thermal bridging, passive ventilation, airtightness and thermal mass, but do your research first. Talk to a surveyor about the site and a structural engineer about the safety of the design. There are other areas to think about, from scaffolding to health & safety; unless you're a skilled person, you'll need professional help.

Utilities: think about heat, power, water and sewage at the design stage. Talk with people who have your favourite technology, to make sure it's going to work in your situation. Start with un-sexy measures like insulation and low-energy/low-water appliances and leave energy generation until last.

Planning / building regs / legislation: find your site, get a solicitor, talk to the local planning department, ask about the local strategy (esp. environment and carbon-saving) and where to find key documents. If your ideas don't fit with the local strategy, you're probably setting yourself up to fail. Building plots usually have outline planning permission, or you can apply for it. The land has to be in the development zone (we'd like reform to allow super-eco homes outside the development zone). See our links page for more on getting planning permission, including for self-build, and for outside the development zone.



You can add low-impact extensions to conventional homes.

There are voluntary / mandatory, government / non-government standards, codes, regulations, certificates, ratings, programmes and targets for sustainable buildings – different for each country, and constantly changing – so it's not possible to go into details here; but talk to your architect / builder, and browse the BRE and AECB websites. In the UK, your self-build needs to comply with building regulations. Building control officers issue completion certificates, which you need if you want to sell or insure your home. Some people don't want to do those things, so they build a cheap eco-home and face the authorities when they're discovered. We don't want to see the countryside fill up with bricks & mortar commuter homes though, which is why we'd like to see a different approach for low-impact homes.

Maintenance: low-impact homes tend to need maintenance – replacing slates/shingles, fresh coat of limewash, repair on a patch of lime or clay plaster. This isn't a bad thing. Maintenance-free usually means that components have to be thrown away when there's not much wrong with them – and well-maintained timber windows (e.g.) can last much longer than uPVC windows.

resources

- see lowimpact.org/building for more info, products, courses books, including:
- Keith Hall (ed), *the Green Building Bible*
- salvo.co.uk - reclaimed materials
- passivhaus.org.uk - standard designed to drastically reduce energy for heating & cooling
- aecb.net - listings of architects, builders etc.
- greenregister.org.uk - more listings
- bre.co.uk - Building Research Establishment

Feel free to upload, print and distribute this sheet as you see fit. 220+ topics on our website, each with introduction, books, courses, products, services, magazines, links, advice, articles, videos and tutorials.

Let's build a sustainable, non-corporate system.

[facebook.com/lowimpactorg](https://www.facebook.com/lowimpactorg)

Lowimpact.org

twitter.com/lowimpactorg

Registered in England. Company Ltd. by Guarantee no: 420502