



Case Study

This new zero-carbon home in a landscaped quarry in Derbyshire has just been given planning permission. The house, which will be mounted on rollers on a railway track, and will revolve to capture energy from the wind and sun, will be entirely neutral in the amount of energy it uses and generates. Planning consultants Fisher German (www.fishergerman.co.uk) used planning policy document PPS7 – Government guidance on development in rural areas – to help get the scheme through the planning process. The owner, Robin Hamilton, says, “I believe this house is the first of its kind and is taking a giant step towards meeting the challenges that we all face, such as dwindling resources and climate change.”

to look to Germany and Sweden, where they have been building low-energy schemes for many years, though even there the number of schemes isn't that great.

for instance, you wanted to specify a wall with a very low U-value, you would require around 300mm of insulation to be placed in it. That's way more than any commercial system we have in Britain could accommodate, so you would have to have it designed and built specially. Features like wall ties, lintels and window closers would have to be sourced specially for your job. Similarly with triple-glazed windows: at the moment, they have to be imported. In fact, there is only one Austrian company with offices in the UK that makes windows which meet the PassivHaus standard. So it will be very time consuming and very expensive to build something close to the Passivhaus standard. And having done this, your home will still be emitting CO₂, albeit at much lower levels than it would have other-

wise been. The low-energy standards are pretty effective at reducing, almost eliminating space-heating requirements, but they have only a marginal effect on other energy requirements.

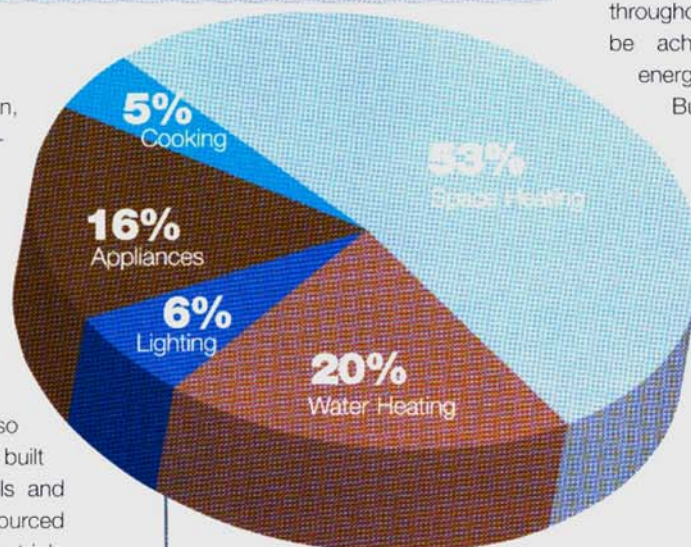
AREN'T THERE OTHER THINGS YOU CAN DO TO REDUCE CARBON EMISSIONS?

I calculate that were my 1992 house built to an ultra-low-energy standard, it would be still be emitting around five tons of CO₂ annually, as opposed to the 11 tons it currently emits. In particular, the hot water demand is still as large as ever and the electrical usage remains horribly high and continues to grow.

The hot water load can be tackled with solar hot water panels. Costing anywhere between £1,500 and £5,000, roof-mounted panels are capable of supplying all your hot water needs in summer and a fair proportion of them in the colder months. As it's a relatively cheap and well-proven technology, it's hard to imagine a low-energy house not using them — as it should shave something like 1.5 tons of CO₂ emissions off your total.

Electrical equipment can also be purchased which will reduce running costs and carbon emissions. Low-energy CF bulbs are one obvious route, though it might be better in a new house to design a low-energy scheme throughout. Similarly, significant savings can be achieved through sourcing the most energy-efficient appliances on the market.

But when all is said and done, you would still end up with a family home emitting between two and three tons of CO₂ annually and it's very hard to see how you could reduce this figure much more without greening your power supply.



Your Home's Carbon Emissions By Type

The average home emits between 10-20 tons of CO₂ per year. You can work out your own house's carbon footprint quite easily by applying the following conversion factors to your fuel bills:

- Mains electricity: each unit (kWh) releases 0.42kg of CO₂
- Mains gas: each unit (kWh) releases 0.19kg of CO₂
- Heating oil: each litre releases around 2.7kg of CO₂
- Bottled gas or LPG: each litre releases around 1.7kg of CO₂