

This is the house that John and Karen built

...and it keeps their family warm for next to nothing

When John Pullen and his wife Karen wanted a warm, eco-friendly family home, they consulted an active advocate of 'passive' technology. Why doesn't everyone live like this?

WHEN we told our family and friends we were building our new house in North East Scotland with no central heating, everybody thought we were mad. Moray is known for its pleasant climate but we still get our fair share of snow and sub-zero winters.

As I'm Galbraith's engineer specialising in construction and renewable energy, most assumed we had replaced traditional central heating with some novel heating gizmo. We hadn't. We had instead appointed a very clever architect specialising in low- and zero-energy houses that don't compromise on comfort and make the most of the light and views.

Kirsty Maguire Architect Ltd is an award winning practice based in Dundee, promoting a "Fabric First" approach to building design. Rather than specifying expensive heating technology, by concentrating on the detailing and insulation of the building itself, the heating requirement can be significantly reduced to approaching zero.

Any of the tiny remaining energy demand to keep the lights and wifi on can be supplied by small-scale renewables or more traditional means.

The low-energy community in Scotland is small but very friendly. Our research took us from Ayr to Ardgay and the message was clear that such construction in Scotland was not only possible, but that everybody should be doing it.

Getting the details right took time but it was worth it. The house was no more expensive to construct than a traditional house, nor did it take any longer. As soon as the insulation was installed (more than 300mm in the walls and roof) the tradesmen worked in T-shirts - this was in January and long before the electricity was connected.

Four years on, the house is still a joy to live in. A very small wood-burning stove provides hot water during the winter, while simple solar panels provide it during the summer.

The household appliances and people generate the vast majority of the heating with the stove on for only one or two hours during the coldest of days. The house maintains a constant 19 to 21°C all year with a gentle trickle of fresh air constantly provided by a small fan under the stairs. We can also open the windows to hear the birds sing or speak to the kids outside.

With heating accounting for more than 80% of an average household's energy consumption, it makes sense to give this serious thought during the design process. Three-quarters of that heating requirement is space heating, so



John Pullen's new family home is clad in timber felled and milled close to the site. It is heavily insulated (right) - and the thermal image testifies to its heat efficiency.

reducing this to near zero represents a significant monthly saving. The remaining heat demand is for water, so gaining around six months free of charge reduces any bills considerably. Our total energy consumption is less than £75 a month. And as well as energy savings, the comfort of a house like this is fabulous.

We would recommend that anybody undertaking a new property development gives serious consideration to the low-energy route. In these days of escalating utility bills, total cost of ownership should be factored in right through the design process. Like those before us, once you've lived in a low-energy house you can't help but ask - why isn't everybody doing it?

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LOCAL MATERIALS, LOVELY VIEWS AND NO NEED FOR CENTRAL HEATING

Architect Kirsty Maguire explains the thinking behind the Pullens' house.

LISTENING to John and Karen's ideas and dreams for a new house at the start of the project, they kept returning to the connection with the surrounding landscape, feelings of light and spaciousness and creating a warm and comfortable eco home.

They loved their current farmhouse home and were keen to create something with the same feeling of homeliness but without the challenges and costs of living in a traditional stone house.

We explored how best to do this - creating a space they love to be in as well as the technical side of comfort and energy use.

We worked with the Passivhaus Standard as a tried and tested tool to focus on the building fabric for enjoyment of the spaces, low maintenance and good return on investment. This reduces the energy use to a minimum, removing the need for conventional heating systems and ensuring energy bills are tiny while keeping comfortable and cosy all year.

In turn, any renewables that are installed are small scale, reducing capital cost and upkeep. Using the Passivhaus modelling software allowed the clients control over specification and budget choices too.

The Pullens' house, located on a rural site a few miles from the Moray coast, is a fresh take on the traditional farmhouse. Designed to reflect the massing and materials of local buildings, it opens up for modern living to the light and views across the surrounding farmland.

The layout is compact yet feels light and spacious due to the long views and large volumes inside the home. The double-height sitting room opens on to the kitchen and dining room with a seating area above. It is also designed to be extended in the future if required.

Materials were chosen to minimise environmental impact, tie in with the landscape, give excellent performance and reduce or eliminate the use of toxic materials. The house has been built from, clad in and is powered by wood. The cladding and fuel are Scottish timber with the cladding grown, felled and milled a mile or so up the road.

Bringing all these layers to the design creates a high quality building and, as John says, why would you want anything else?

Kirsty Maguire Architect Ltd offers a full architectural service from project conception to handover, integrates energy and eco design into all projects and are specialists in this field. The firm also offers specialist consultancy to other architects and designers.