Eco haven

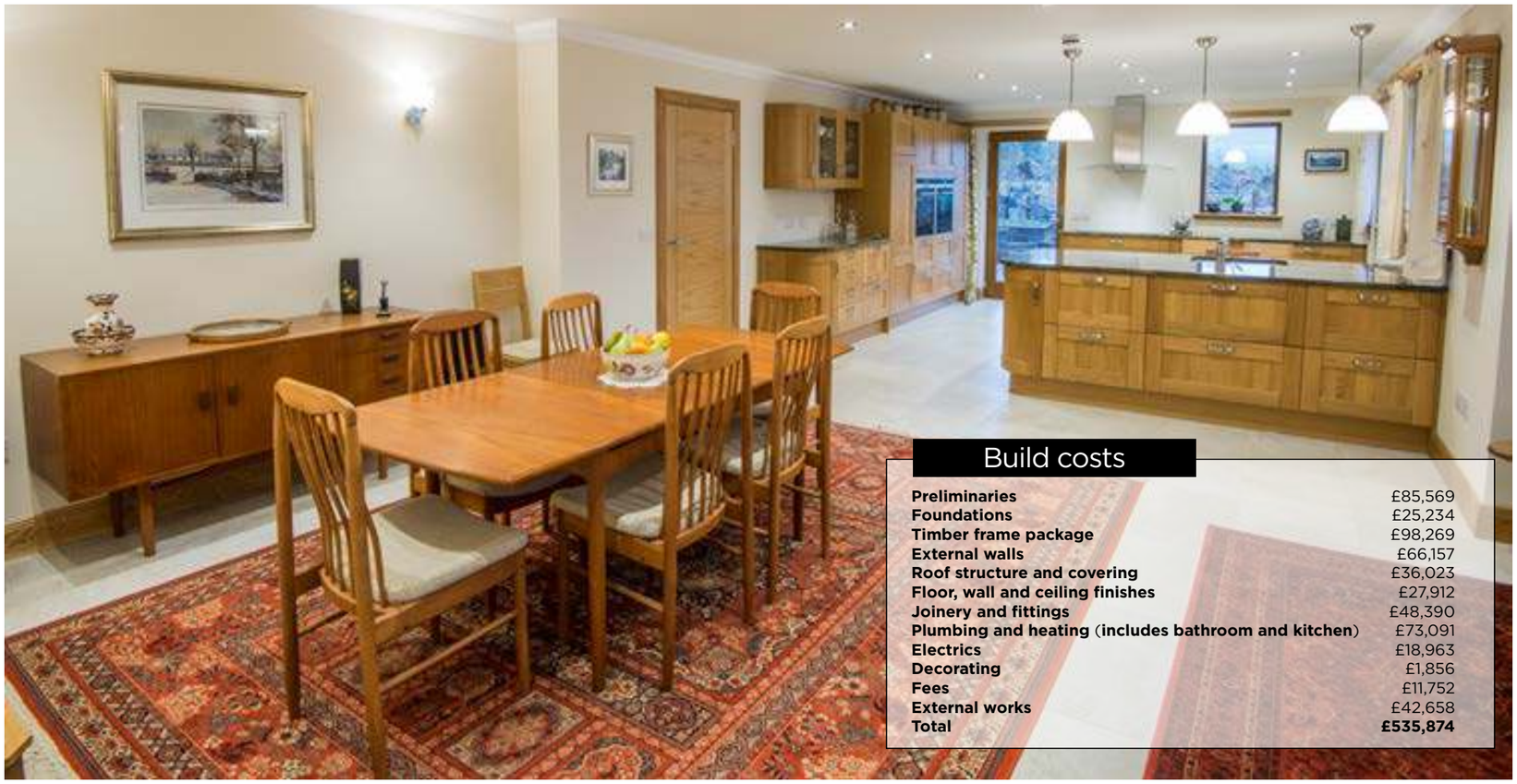
Barbara and Deryck Lovegrove built a new low-energy home in the Scottish Highlands that is both green and practical.

STORY: **Deryck Lovegrove**

EXTERIOR
Barbara and Deryck Lovegrove outside their new timber-frame home built on the side of a glen on the southern edge of the Cairngorms National Park. The low-maintenance house, built for the couple's retirement, is sited to maximise solar gain and has many eco features, including high levels of insulation and a ground source heat pump.

IN BRIEF

Location: Southern Highlands
Project: Classic timber-frame new build
Plot size: 2,337 sqm
House size: 277 sqm, plus detached block-built garage, 58.87 sqm
Build cost: £509,630 (£1,518/sqm)
Worth: £650,000



Build costs

Preliminaries	£85,569
Foundations	£25,234
Timber frame package	£98,269
External walls	£66,157
Roof structure and covering	£36,023
Floor, wall and ceiling finishes	£27,912
Joinery and fittings	£48,390
Plumbing and heating (includes bathroom and kitchen)	£73,091
Electrics	£18,963
Decorating	£1,856
Fees	£11,752
External works	£42,658
Total	**£535,874**

In 2012 we had been living for 15 years in a large 18th-century farm steading we had rebuilt into a modern, energy-efficient, comfortable country house. That project had honed our skills and given us a home that we greatly loved in a beautiful area near the southern edge of the Cairngorm National Park. However, advancing years suggested that we should consider moving to a smaller property – one that was easier to maintain and more closely suited to our needs. In spite of the daunting challenge involved when we were both well into retirement, our sense of belonging conspired with a lack of suitable sites or properties in neighbouring towns to lead us to build a new house on our existing ground.

Uppermost among our priorities was the achievement of a building that would offer low maintenance (especially externally), high energy efficiency (including a significant renewable element), single-level living for ourselves coupled with additional space for the frequent accommodation of family and friends. A large detached garage/workshop and polytunnel were also on the shopping list to take account of leisure interests.

Although outline permission to subdivide our large rural plot and build closer to the road was quite readily obtained, by the time full planning permission was sought a new planning officer was in post who seemed incapable of reaching a decision, constantly raising difficulties and telling us that he was 'minded to refuse'. In the end we had to force the issue by pointing out that he was outside his own council's published time frame. At the point where the deadline for leaving the old house was rapidly approaching, we at last got approval in August 2013. Thereafter the build went remarkably smoothly. In contrast to the planning process, which we felt was both subjective and arbitrary, members of the local Building Control were very helpful. They operate according to properly categorised and nationally published rules, most of which are dictated by practical common sense.

We had at first envisaged using the services of an architect but the first one quoted us an eye-watering fee whilst a second took absolutely no notice of our wishes and seemed only interested in pushing his own ideas. Fortunately, our elder son is not only a skilled chartered surveyor with many years' experience but also has a Masters in Project Management. We sat down together and sketched out a plan that took account of our wishes and the possibilities offered by the site.

The exteriors design follows such traditional features of Scottish rural architecture as the one-and-threequarter storey configuration with dormer windows and the wet dash rendered exterior walls. However, internally the house employs a high spec timber frame with factory-fitted insulation, high levels of air tightness and uses underfloor heating powered by a ground source heat pump.

We have always believed that good house design should link internal and external factorsas our plot sits on the north side of the glen, sloping gently towards the south-west, and enjoys lovely open views to the east, south and west, we felt it was important to make the front elevation truly south facing for maximum solar gain. This meant that the house would be skewed across the plot. Despite our initial fears, this was not opposed by the planning officer, although the consent required us to

Stairs
The oak staircase was supplied by Bill Pitt Manufacturing Joinery, whilst the oak bookcase was fitted and supplied by Wallace Joinery.

IN DETAIL

PROJECT
Project manager Thistle Property Consulting: 07808 110046
Structural engineer McKay & Partners: 01750 721726
Drainage consultant JIG Ltd: 0141 221 4747
STRUCTURE
Groundworks contractor William McConnachie: 07860 505769
Foundations and blockwork D Elder Builders: 07756 457797
Concrete screeding Gordon Wyllie: 07841 036517
Timber frame, insulation, internal doors Fleming Homes: 01361 883785
Kit erection and joinery up to first fix Andrew Blair Joinery: 07808 067210
Rationel external doors and windows ADW: 01236 780022
Electrics John McIntosh: 07971 520435
Heating system Black Isle Renewables: 01349 877029
Plumbing Montrose Heating & Plumbing Ltd: 07885 560227
Window surrounds Leiths Montrose Precast: 01674 677037
Guttering and downpipes Lindab: lindab.com
FIXTURES AND FITTINGS
Finishing joinery Frank Reid: 07596 614916
Oak staircase Bill Pitt Manufacturing Joinery Ltd: 01575 575576
Fitted oak bookcases Wallace Joinery: 07774 979435
Slating and leadwork D Simpson: 01575 573167
Plastering and tiling Gary Brodie: 07886 026030
Sanitaryware and fittings William Wilson Ltd: 01738 638323
Floor and wall tiles Porcelanosa: 0131 335 3883
Kitchen units Howdens: 01382 889486
Granite worktops The Surface Works, Motherwell: 01698 265357
Wood-burning stoves and flue liners The Burning Question: 01738 633113

build the house as far as reasonably possible up the slope to obviate any flood risk from the burn on the other side of the southern boundary road. The flood situation has now been tested on several occasions by severe weather and we have remained gloriously high and dry – several metres above the flood plain on the other side of the burn. This is certainly a factor that needs to be considered carefully before the purchase of any site.

The shell of the house consists of a highly insulated 145mm x 45mm timber frame, clad externally with a high-density concrete block covered by a self-coloured wet dash render. This finish, in conjunction with the wider-than-average 70mm cavity, is designed to withstand the rigours of the northern climate at 200m above sea level. The roof is clad with Cupa Heavy 3 Spanish slates which carry a 100-year guarantee. The main house is rectangular with two separate wings, each designed as a self-contained thermal envelope. The west wing is single storey while the north has a large attic room opening off the landing. The ground floor is fully tiled over a heated screed, apart from the north-wing bedroom where tiles are replaced by a fitted carpet. The first-floor rooms are heated by conventional radiators in order to produce a more rapid response to changes in weather conditions.

The building deliberately has generously proportioned rooms which offer all the facilities we need, including a large bedroom and en suite on the ground floor. When friends and family stay there are three large double bedrooms with a bathroom and a further en suite on the first floor. There is also a separate large study occupying the north attic with lovely views to the east and west through four Velux windows.

On the ground floor, apart from the bedroom, there is a spacious entrance hall used as a multi-purpose room with a modern wood-burning stove. The hall links the various parts of the house with an attractive open-plan oak staircase and acts as a cosy sitting area, especially on winter evenings. The interior of the hall also has a small guest toilet.

To the west of the hall a glass door and screen lead into a six metres by six metres lounge with windows on three walls, a 2.7m high ceiling and a large wood-burning stove as a focus. To the east of the hall, through another glass door and screen, is a spacious room with dining area, kitchen and a sunny single-storey pavilion window, which projects from the southern façade and is large enough for four armchairs. On the north side of the kitchen a door leads to a well-proportioned utility room. From that, in turn, doors lead to the plant room, a small toilet and – via the back door – to a large covered veranda. The plant room houses the ground source heat pump and forms the heart of the electrical and communications network of the house.

Apart from adopting a very high spec for the polyurethane insulation and extensive use of triple glazing (except on the lengthy south-facing aspect), the house employs low-energy lighting throughout. The use of mechanical ventilation and heat recovery was carefully considered but rejected on grounds of noise, cost, maintenance and probable ductwork condensation. Instead the house uses trickle window vents in conjunction with humidistat-controlled isolatable low-energy extract fans.

At an early stage we decided that we would do our best to reduce the energy demands of the house. Given our latitude we rejected the idea of using solar photovoltaic panels. Our main ecological focus, therefore, has been on providing the house with heating from a ground source heat pump. Because of the shape of the site we chose to use a borehole and, to our great good fortune, this struck a copious flow of artesian water at about 7°C. As those who write about heat pumps say, this is the best possible supply for a ground source heat pump.

Used in conjunction with smart zone thermostats and underfloor heating on the ground floor, the heating and hot water needs of the house are met with efficiency and low cost. The 300 litre hot water cylinder is recharged by the Nibe F1145 heat pump from cold in approximately 40 minutes. In the (fortunately very rare) event of an unplanned mains power cut, the two wood-burning stoves are able to keep the house as a whole reasonably comfortable. All plumbing is located inside the insulated envelope.

We are reasonably experienced selfbuilders and are both very practical. However, all building projects throw up the unexpected. Probably our worst moment came early on when the borehole drilling rig struck a gushing supply of underground water, which threatened to flood the garage footings just as the builders were due to come on site. Fortunately, our groundworks contractor and his team are highly experienced and totally unflappable and soon had an adequate drain installed. In the event the situation worked decidedly to our advantage by giving us an endless supply of relatively warm water for the heat pump and, as a bonus, a constantly flowing stream in our garden that wildlife really appreciates.

We were both aware from past experience of the importance of assembling a good team of craftsmen and suppliers. We took great care to do this, going by recommendation and past experience rather than cost. One of our best decisions, however, partly stemmed from a chance encounter at an exhibition when we made the acquaintance of Fleming Homes of Duns and their dynamic and helpful managing director, Hayden Martin. The firm went out of its way to help us throughout the project. It is one of the finest and most client-focused commercial firms we have encountered.

Between our own daily presence on site and the invaluable and wise input from our project manager,

Kitchen/ living areas
The Howdens kitchen units have granite worktops supplied by The Surface Works in Motherwell. Views of the glen can be enjoyed through the large windows in the lounge, with the wood-burner providing a central focal point.

Bedrooms
A large master bedroom and en suite is on the ground, with three guest double bedrooms, a bathroom and a further en suite on the first floor.

the build went incredibly smoothly, aided by weeks of abnormally dry, sunny weather and a site that had been impeccably prepared by our groundworks contractor.

The kit came on site as the clocks went forward in late March 2014 and by summertime's ending the following October we were approaching completion. This was not an economy build but neither did we adopt needless extravagance. We bought good quality fittings but we negotiated hard in order to get good prices. Our greatest extravagance was probably the three beautiful granite worktops which grace the kitchen and give us enormous pleasure.

The most enjoyable part of the whole experience was undoubtedly watching our conception taking shape before our eyes and enjoying the day-to-day crack with the various people employed on the project. It was a very happy and positive experience that delivered us the retirement house of our dreams and which came in both on time and on budget.

FIVE TOP TIPS

1) Do your preparations thoroughly, setting a realistic budget and timetable for each aspect of the build.
2) Keep ahead of developments and communicate with your tradespeople, letting them know clearly when they are required on site.
3) Avoid changing your mind. Every change adds to the overall cost.
4) Be present on site as much as possible yourself but avoid appearing to stand over people. Be friendly and considerate.
5) Pay your bills promptly.