

# Cooking without gas

How one couple kept all the original features of their house — except the boiler. By *Cherry Maslen*

How do you turn a period house into an eco-home without damaging the characteristics that make it special — original sash windows, open fireplaces, leaky old floorboards? Few people appreciate this dilemma more than Sarah Freeman, 33, an inspector of buildings for Historic England, and her husband, George Simms, 40, a local government retrofit specialist. They are also the proud owners of a red-brick, three-bedroom terraced house built in about 1900 in Bournville, Birmingham. They have just finished a low-carbon retrofit of the whole house to reduce energy consumption dramatically while at the same time adding a small timber side extension to create a garden room.

“Old houses are often viewed negatively in terms of energy consumption but there’s a lot you can do to improve them,” Sarah says. “Every traditional building is unique and needs a bespoke approach to managing any risks involved with retrofit work. What I’ve learnt through Historic England is how to combine retrofitting with conservation, by using minimal intervention and understanding how old buildings work.”

The best time to retrofit is



George Simms and Sarah Freeman at their Victorian terraced home in Bournville, Birmingham  
RICHARD LEA-HAIR

when you’re extending or renovating, but ahead of any building work you need a condition survey to find out what repairs and maintenance are needed. “You need to make sure your house is ‘retrofit ready’ before you start; people dive into making changes but there’s no point in retrofitting your house without dealing with any existing damp or structural issues,” Sarah warns.

The couple also emphasise the benefits of taking a whole-house approach, with an overall plan rather than piecemeal work, even if you don’t do everything at once. They stress the importance of other surveys: they had an air-

tightness test and [thermal imaging](#) to show where the leaks and cold spots were, and energy monitoring to check how and when they were using energy. They worked with Harry Paticas, an architect specialising in retrofit. “Retrofit is a growing market but there are still too few specialists, though some companies are developing all-in-one services,” says George. He recommends RetrofitWorks, based in London, and Carbon Co-op and Red Co-op, both based in Manchester.

The pair bought the house in 2017 but wanted to live in it before deciding on the best way to retrofit and renovate.



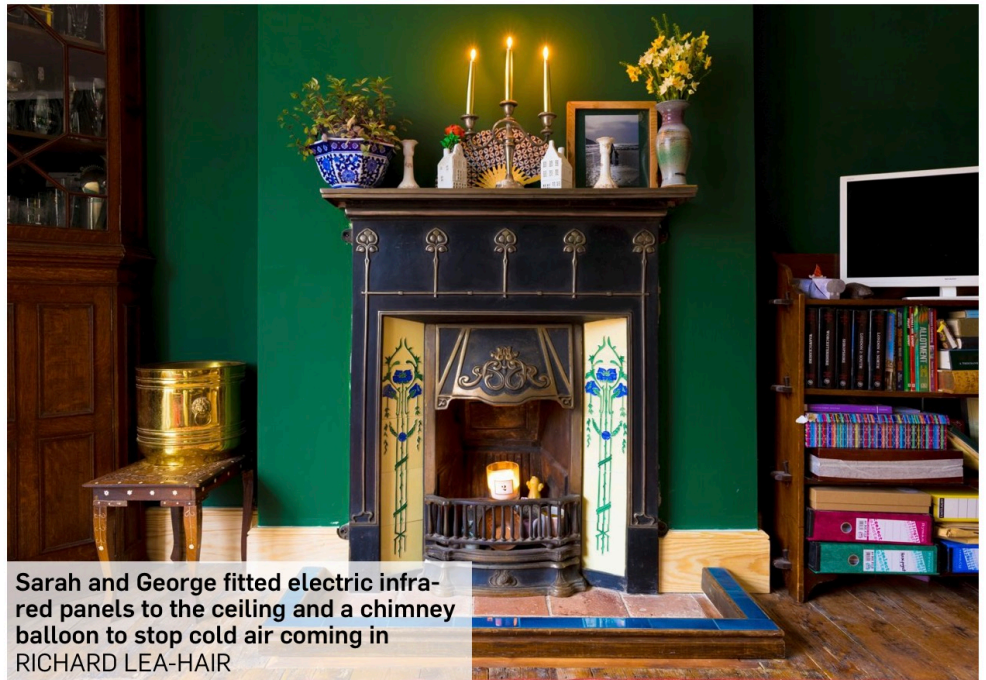


By the time they were ready Covid intervened, so their project wasn't finished until January this year.

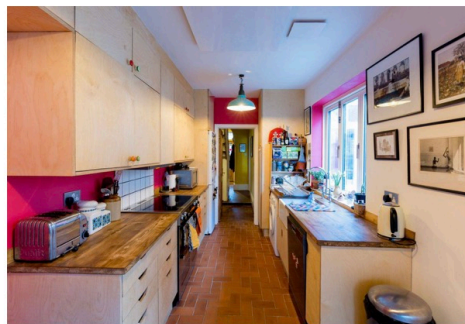
One of the biggest energy-saving hits is wall insulation, but like other period homeowners the couple had no cavities to fill and couldn't add external insulation without destroying the red-brick exterior. "We decided on internal insulation, but old buildings need to breathe and there's a risk of trapping moisture within the walls," George says. "So we used breathable woodfibre insulation panels. You take the plaster off back to the brick, then fit the panels and finish by replastering with breathable lime or clay plaster."

Historic homeowners will need to preserve original ceiling corncicing carefully when insulating walls. "If it's timber it can often be taken off and reinstated afterwards," George says. "If not you could use insulating plaster as an alternative." The only surviving corncicing and corbels in the Bournville house are in the hallway, which luckily didn't need insulating because the walls are internal.

George and Sarah were delighted to find original floorboards when they took up the old linoleum but the room temperature dropped instantly. Old floorboards tend to have draughty gaps, so they stopped warm air disappearing beneath their



Sarah and George fitted electric infrared panels to the ceiling and a chimney balloon to stop cold air coming in  
RICHARD LEA-HAIR



As part of the refurb the couple had a new kitchen with a reclaimed butler sink  
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feet by insulating under the floor using the same woodfibre panels as the walls. Fireplaces in old houses mean cold air coming down the chimney, but a chimney balloon on a stick does a good job when the fire isn't being used.

The Bournville house retrofit wasn't just about saving money on energy. Its owners are committed to living as "carbon light" as possible and no decision was taken without aiming to

minimise embodied carbon (that is, the emissions associated with the original construction) as well as conserving energy. "We wanted to retain as much of the original fabric and layout as possible," Sarah says.

They recycled bricks from an old rear extension that housed a loo and utility space and used them for the new garden room. Here they reused glazing from the old aluminium windows in the rest of the house that were replaced with timber triple-glazed ones. "Had the original sash windows survived we would have kept them and opted for secondary glazing," Sarah says. As part of the refurb they had a new kitchen but with a reclaimed butler sink. They recycled the old kitchen via Freecycle. They even repurposed the old bath as a planter on their allotment



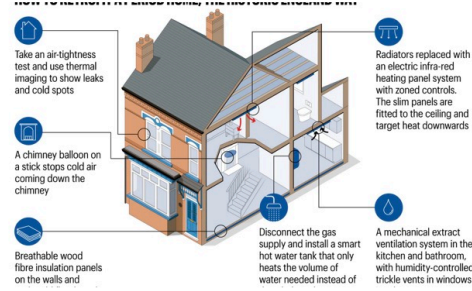


when the bathroom was updated.

They decided to disconnect the gas supply. George says: “We decided not to use gas because we wanted to stop using fossil fuels because of the climate crisis. But I was also aware of the problems of being dependent on energy from overseas. Energy is at the root of a lot of conflicts, such as the Gulf War, so it’s clear that the less we’re dependent on energy from overseas the better.

“We haven’t noticed any downsides of not having gas, we just have a normal electric oven and an induction hob. Of course we’re concerned about higher electricity costs like everyone else, but we have literally insulated ourselves against rising energy bills. Because our house is so well insulated, if we turned our heating off completely the temperature wouldn’t drop too drastically — even on very cold days it wouldn’t go below 16 degrees, so we could just put on more jumpers.”

The couple have installed a smart hot water tank that heats the volume of water needed instead of the whole tank. “You programme it to whatever you need, whether that’s quick showers in the morning or a deep bath in the evening,” George says. They also got rid of the radiators and put in an electric infra-red heating panel system with zoned controls. The opposite to underfloor heating — which can be a problem for old



floorboards and risks damaging original floor tiles when they’re lifted — the slim panels are fitted to the ceiling and target heat downwards.

“They work really quickly; we have a thermostat in every room that we can control through a phone app so you only heat a room when you need it,” says Sarah, adding that properly zoned, flexible controls make a big difference to running costs. “They do a great job, the house is really comfortable and they don’t take up any space.” The only room without one on the ceiling is the bathroom, where an upright mirrored radiant panel is used instead of a conventional mirror. “It’s great because it never steams up,” Sarah adds. Radiant heaters are also a low-carbon option in line with government targets for net zero carbon homes.

“When you improve the insulation of any building you need to think about whether ventilation is adequate or needs upgrading,” George says. They chose a continuous mechanical extract ventilation system in the kitchen and bathroom, with humidity-controlled trickle vents in windows in other rooms.

Despite lifestyle changes of working from home and having a baby — Layla was born in summer 2020 — the family are on track to reduce their heating demand by 60-70 per cent. “Between March and November I don’t think we’ll need the radiant panels at all,” George says.

The original budget for the whole project was £100,000 but costs for materials and labour went up because of Covid. They also discovered structural issues with rotten timber joists and unstable brickwork because the house hadn’t been maintained for years. The final cost was nearer to £150,000, with the biggest expenses structural work at £20,000, new timber windows at £26,000, the timber extension at £25-£30,000, and the high-spec wall insulation with added sound insulation and specialist plastering at £20,000. The radiant panel heating system was about £5,000, the ventilation system £2,500 and the hot water cylinder and pipework £1,500.

“The house is so much more comfortable now. We appreciate that what we’ve done goes beyond what many people would put into a project like this,” Sarah says. “But we plan to live here for a very long time; we see this as an investment for our future as a family.”

*Information on looking after older buildings including retrofitting can be found at [historicengland.org.uk](http://historicengland.org.uk)* ■

