

A thermal image of a well-insulated house should be on the blue spectrum – pink and yellow suggests warmth is escaping

Say ‘Freeze!’

Is your home chilly and you don’t know why? Meet the owners using a thermal imaging camera to assess heat loss. By Jayne Dowle

The first thing Rupert Gregory did when he got his hands on a Flir thermal imaging camera was to point it at the family cat and then a cup of tea before turning the lens on his intended target: his four-bedroom Victorian end-of-terrace in Twyford, Hampshire.

“It’s quite entertaining,” says the 37-year-old IT consultant, who is one of a growing number of homeowners who are taking advantage of new — and more affordable — technology to detect draughts, cold spots and unexpected sources of energy loss from a property. They are

taking the decision to prioritise what eco-efficiencies are needed not just to cut their bills but to avoid being ripped off by unscrupulous home improvement companies.

“After you’ve played around with the camera for a bit you move on to the job at hand,” says Gregory, who borrowed a Flir camera from the energy supplier Octopus Energy. “Ideally you want the house hot and outside cold, so do this exercise in winter. You should always look at junctions,



Need to know

- A thermal imaging camera works more or less like a normal camera, except the image sensor makes pictures from heat, not visible light.
- Look for a camera that digitally overlays the thermal image with a high-resolution “visible” one so you can understand the picture more easily.
- If you use a thermal imaging camera designed to work with a mobile phone, you’ll be

required to download an app to operate it. You can store the images you take on your phone and send or share when necessary.

- Some cameras, including the Flir models, come with software that allows you to interpret data, such as the Flir Home Inspect, which is only on iOS and in selected countries including the UK. Victoria Lind of Flir says that there are also apps developed by other companies for use

with Flir cameras, such as Heat3D, using augmented reality and advanced technology to calculate heat flow through buildings.

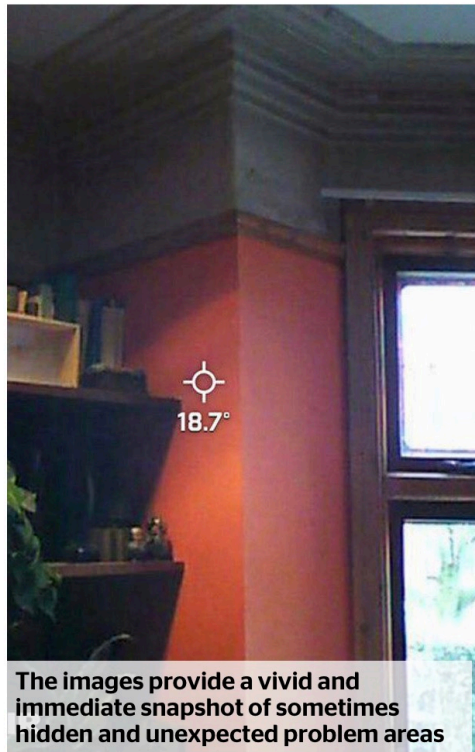
- Thermal cameras have pixels, like a normal camera, but start at lower resolutions, typically 80 x 60. If maximum detail is important to you look for models with the highest resolution possible: up to 1280 × 1024 pixels or more.



Using a thermal camera, Mick Wall discovered that underneath the bay window there was nothing at all between the internal plasterboard and the outside tiles

corners, cracks, around door frames. You’ll see the cold coming in as dark blue and purples. The picture almost looks like water coming under the door.”

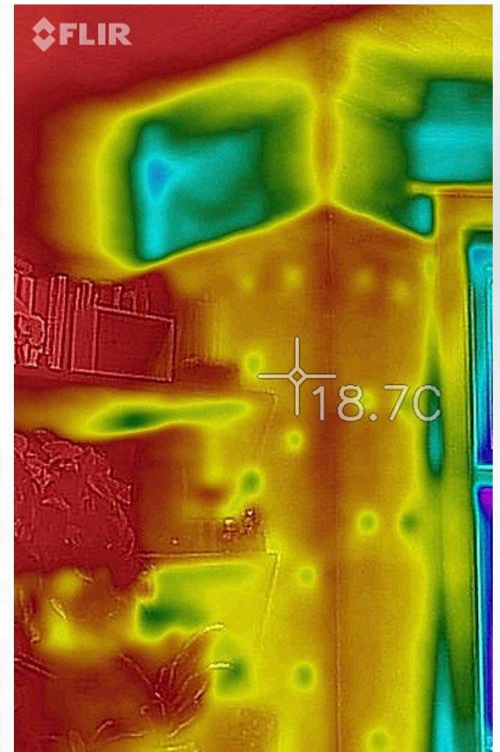
The images provide a vivid and immediate snapshot of sometimes hidden and unexpected problem areas. Heat-dominated bodies, including humans and other warm-blooded creatures, show up as yellows, oranges and pinks through to red. Taken from



The images provide a vivid and immediate snapshot of sometimes hidden and unexpected problem areas

outdoors, a thermal image of a well-insulated and heat-retentive house should be mostly on the blue spectrum. A rosier hue suggests warmth is escaping from indoors.

Gregory discovered draughts



along floors and skirting boards and under the front door. He also spotted dislodged insulation in a bedroom ceiling, shaded blue on his images. “I would never have seen that if I hadn’t had the camera,” he says.



He has also helped neighbours track down escaping energy in their own homes.

After spending £250 to £300 on draught-proofing and insulation measures, Gregory and his wife, Gemma, have managed to cut their family home's £125 monthly dual fuel bill substantially. "Post-works this went down to £100, so a 25 per cent saving. What's good is that even though the cost of gas and electricity has increased, my monthly bill has only gone up to £105."

Until the new generation of mobile phone-friendly cameras came along and opened up a whole new world of possibility, thermal imaging cameras were the handheld preserve of professionals, used by emergency and rescue services to locate missing people and by surveyors, electricians and plumbers to find "hotspots" in wiring and heating systems.

Now the relatively affordable cost of thermal imaging camera attachments, suitable for iPhones and other mobile phones, is helping thermal imaging to take off. While professional stand-alone cameras (also known as heat cameras, thermal detection cameras or infrared cameras) such as the Bosch GTC 400C thermal imaging camera ([Screwfix](#), £938.99) can easily cost four figures, the Flir camera starts at £226.80.

Chris Williams, 34, a project manager for Evergreen Energy, an energy equipment company, was surprised at the colour spectrum he found when he

borrowed a thermal imaging camera from Greater Manchester Carbon Co-op, an energy services and advocacy co-operative, for a week in January to assess his 20-year-old four-bedroom detached house in Sharston, south Manchester.

"When my house was built they put in cavity wall insulation that looks like bubble wrap," says Williams, who lives with his wife, Becky, and three-month-old son, Cassian. "It's not great insulation and because it's got foil in, it can't be upgraded. They can't blow anything in case it gets stuck on the foil as this could create voids, which could lead to damp forming. I expected the walls to show up as seriously leaking heat, but actually they were OK. From the outside the walls came up blue and the windows were bright red." As a result Williams is now looking to upgrade his windows rather than spend more on the walls.

Mick Wall, 50, an IT support worker who lives in a 1930s semi in the Sheffield suburb of Loxley with his wife, Emily, a nurse, and two children, James, 8, and Lauren, 12, was similarly empowered when he borrowed a thermal imaging camera from Octopus Energy last year and pointed it at his front bedroom, which had felt cold for two decades. He discovered that underneath the bay window there was nothing at all between the internal plasterboard and the outside tiles. "A local builder from Practical Property Services stripped it back for us to prove

there was nothing but fresh air there," he says. He then put it all back together using 75mm of insulation board and air-tight tape. From memory the whole of the work, including redecoration, was about £1,000."

One of the challenges is how to interpret the data. Many local organisations such as the Greater Manchester Carbon Co-op, which has an online forum, will offer advice — or you could use it as a starting point for a professional home-energy assessment.

Think of a thermal imaging camera as similar to a smart meter in terms of giving you direct access to information about your home, says the retrofitting expert Charlie Baker, the founder of Red, a Manchester-based consultancy specialising in renewable and sustainable projects. His company charges from £95 for a diagnostic visit and discussion to £500 for a detailed assessment of the whole house, with budgeted costs for improvements: "In both cases, where timing of the visit and weather make it feasible, the infrared camera is one of the tools we use, alongside a meter to measure temperature and air humidity."

Jenny Turner, property expert at the insulation distributor Insulation Express, says the benefits of hiring a professional "will come down to detailed reporting on cold spots, which may offer more insight than a DIY approach"; but not half as much fun, we suspect — especially for the cat. ■