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Warm up your home guide

Modern materials and technological advances make it easier than ever to stay stylishly cosy and energy efficient

WORDS **KUNLE BARKER**

This striking design can be suspended or fixed on a base. Bathyscafocus wood- burning stove, from £5,934, Focus Fireplaces (focus-fireplaces.com)

Generation and distribution

Ensuring adequate warmth in your home involves three distinct processes: generation, storage and circulation. For many people, a boiler is still the most effective way to generate heat, but you could try using ground or air source heat pumps, or solar energy. You'll need to determine which fuel source, such as gas, electricity or solar power is your most readily available and economic option. The best solution may involve more than one of these.

There are two ways of storing heat. An insulated hot water tank can be used for underfloor and in-wall wet systems, while batteries are a more recent development for storing solar-generated electricity.

> You need to decide which fuel source, such as gas, electricity or solar power, is your most readily available and economic option

When hot water is used to distribute heat around your home, as in central heating, this is known as a wet system, whereas a dry system uses electrical cables for distribution.

Your property's level of insulation and heat loss will dictate the amount of warmth you'll need to generate and distribute to maintain a comfortable temperature. An energy audit will help ensure you install the most efficient system for your home. A professional Home Energy Rater will provide this service for a fee, or you can carry out your own survey. Visit energystar.gov to find out more.

The Greenstar i gas-fired combi boiler is A+ ErP-rated when fitted with a Bosch EasyControl smart control. From around £2,500, Worcester Bosch. (worcester-bosch.co.uk)

Triple-glazed windows and a polished concrete floor help to maintain an even temperature in this super-insulated self-build

Boilers and water tanks

A property's size, orientation, type of glazing and the number of bathrooms will all influence how powerful a boiler needs to be. They should, generally, be fitted inside the property, on an exterior wall and vented via a flue. There are strict guidelines surrounding venting, including length and proximity to windows. Make sure you use a qualified Gas Safe installer and check their credentials on the Gas Safe website (gassaferegister.co.uk).

Condensing boilers recycle energy to reuse, so need less to heat water for a bath, shower or to warm your home via underfloor or in-wall heating systems.

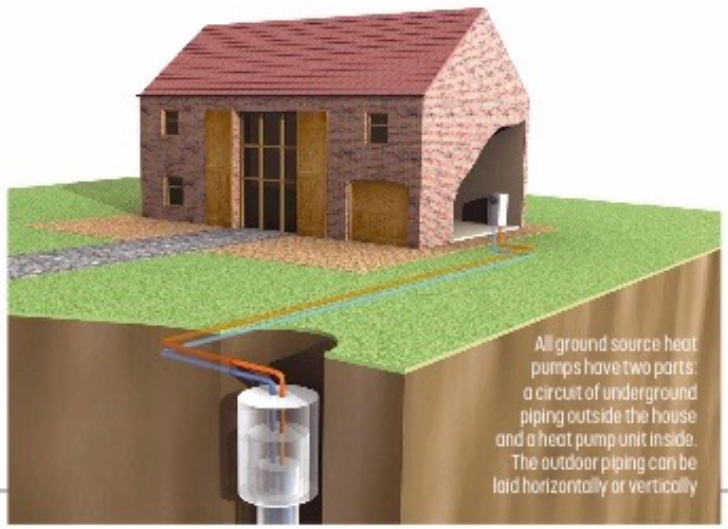
Well-insulated water tanks operate under mains pressure to supply your taps and shower and, as with condensing boilers, can also work with low-volume wet heating systems.

TAKE A 'FABRIC FIRST' APPROACH

The structure of your home will, in large part, dictate its demand for heating, says architectural designer and Passivhaus consultant **Joe Stuart** (07789 221 621; warehome.co.uk)

- A concrete build will take longer to heat up, but retains heat for longer than one constructed from a lightweight timber frame. This slower-reacting material acts as a 'thermal mass' and can help hold a comfortable internal temperature for longer. Conversely, a timber-framed building will reach a desired temperature faster, but it will be harder to maintain. These differences will inform your choice of heating. In a concrete house, you may want to use underfloor or in-wall heating, whereas in a timber house, heating the air using mechanical ventilation with heat recovery (MVHR) might be appropriate.
- The type, thickness and position of insulation plays a huge role in how well the heat generated by your home is retained. The most important thing is that your insulation forms a complete and unbroken seal around your house. Pay close attention to connecting areas to avoid 'cold bridges'.
- Be aware of gaps across the external envelope (walls, roof, windows, etc). Even small holes can contribute to heat loss so, regardless of the type of building material used, the level of air tightness will contribute to how efficient your chosen heating is.
- Well-placed windows can help to capture the sun's heat, but poorly sited ones can cause overheating. Upgrading to double or even triple glazing will reduce heating demands.

Air source heat pumps capture heat in the outside air and transfer it inside. Pumps from £6,249; Viessmann (viessmann.co.uk)



All ground source heat pumps have two parts: a circuit of underground piping outside the house and a heat pump unit inside. The outdoor piping can be laid horizontally or vertically

ILLUSTRATION WORCESTER BOSCH

Ground source and air source heat

Heat pumps work through a process of heat exchange, drawing warmth from an outside source and using this energy to heat the water in your home, which can then power heating systems or be stored in an insulated tank for later use. To be most effective, heat pumps require a very well-insulated building.

Ground source heat pumps lie beneath the ground, drawing warmth from the earth, which means digging a trench or borehole in your outside space. They are often installed in conjunction with underfloor heating.

Air-source heat pumps are fitted outside at ground level or on brackets attached to an exterior wall. Unlike ground- source heat pumps, which work well in all seasons, they are less effective in winter and you may need a back-up source of warmth during the colder months. »

Match your radiator colour to your room's decor. Classic radiator in anthacite, from £340.40, Bisque. (020 7328 2225; bisque.co.uk)

Solar PV systems convert the sun's energy into electricity, which can then be stored in a battery. A BYD 270w Home solar PV system costs around £6,500 from Infinity Energy Services (0800 909 8882; infinity-energy.co.uk)

Solar panels

Photovoltaic (PV) solar panels collect the sun's rays to generate electricity. With advances in home solar-battery technology, any excess can be stored for later use. 'A typical south-facing panel produces the bulk of its electricity during the sunniest times of the day, at around midday,' says David Lewis of Infinity Energy Services (0800 909 8882; infinity-energy.co.uk). 'This burst is usually greater than is needed at the time, but battery storage allows this excess to be captured and used later on.'

Thermal solar panels use the sun's rays to heat a liquid, which is then used to warm up water stored in a tank. As they are reliant on sunny days, they may not be the best option for your main source of hot water.

Radiators now come in a variety of colours and designs, from contemporary flat panels to vintage-style models

Radiators

Due to improvements in their construction and the materials they are made from, modern radiators are more efficient, using less water and heating up more quickly than their older counterparts. Available in a variety of colours and designs, from contemporary flat panels to vintage-style models, try traditional column radiators or sleek, vertical designs in a vibrant colour to make a bold statement in your room. »

Keep towels toasty with this R70 towel warmer, from £742.80, Aestus. (01902 387 080; aestus.co.uk)

STORE IT ALL

Trevor Cross, UK sales director at **Sunamp** (sunamp.com; 01875 610 001), explains the benefits of heat batteries

- These thermal-storage devices contain non-toxic, non-flammable materials that provide energy for hot water or heating systems, and have a lifespan of more than 40 years.
- They can be used with gas boilers, solar panels or heat pumps. And if the property has sufficient insulation, they might form the main source of heating and hot water. The batteries can also be used with low-volume wet systems, such as underfloor heating.
- A heat battery has a lower rate of heat loss than a traditional water tank, making it more energy efficient.

Wall-mounted wood-burning ME stove, from £2,495, Nordpeis. (01392 474 000; nordpeis.co.uk)

Stoves

Whether traditional or modern, wood burning or multi fuel, a stove adds character and a focal point to an interior. 'A solid fuel stove or fire can be installed almost anywhere, as long as there is a flue,' says Dave Saunders, special projects engineer at Stovax. 'The installation must also meet the requirements of both the product and building regulations.'

A stove adds character and a focal point to an interior. The installation must also meet the requirements of the product and the building regulations

Where you live in the UK will determine how big or small the flue needs to be, as building and ventilation requirements vary across the country. Check with your local council and building control office before fitting.

A recent UK government consultation laid out plans to reduce air pollution in Britain by ensuring that only the cleanest fuels are burnt. From 2022, only the most efficient stoves will be available. Until then, do your research and buy the most efficient model you can afford. Visit the Burn Right website (burnright.co.uk) for more information. »

The 4143 wood-burning stove, £1,800 from Morso, is approved for use in smoke-free zones. (01788 554 410; morso.co.uk)

Powered by natural gas or LPG, the Loft stove has a programmable remote control. From £2,195, Gazco. (gazco.com)

FUEL FOR THE FIRE

Consider which type of fuel to use, says **Annabelle Carvell** of the **Stovax Heating Group** (stovax.co.uk; 01392 474 000)

- **Solid** There are two types of solid fuel appliance: the wood burner that only burns logs, and the multi-fuel appliance that can burn either logs or smokeless fuels. A solid-fuel stove or fire can be installed almost anywhere, as long as there is a flue and the installation satisfies the requirements of the product. There may also be some maintenance required to keep the stove burning efficiently and cleanly.

- **Electric** An electric fire or stove plugs in to the mains and doesn't require a flue. Often slimmer and lighter than their gas or solid-fuel counterparts, some can be hung on a wall or placed in a corner.

- **Gas** Gas installations are convenient, with many models offering remote controls that allow you to schedule times for your appliance to switch on, as well as selected temperatures. A conventional-flue gas appliance needs a chimney, but a balanced-flue gas fire does not. Balanced-flue installations require a twin wall pipe to vent directly to an outside wall. Air for combustion is drawn in through the outer pipe, while the inner pipe removes the combustion gases through the exterior of the property.

- **Flue options** If you don't have a chimney and want to install an appliance that requires a flue, you may be able to have a pre-fabricated system installed. This works in the same way as a normal chimney would, and there are options that make it possible to have one inside or outside your home. Every installation is different, so you will need to obtain advice from your retailer, who will arrange a site survey.

Underfloor heating maintains the clean lines of this renovation project by McLaren Excell. (020 3598 0673; mclarenexcell.com) (See also below)

Smart heating

Smart controls can be retrofitted or installed as part of a whole house renovation or self-build. You can manage a complete system, or just a single radiator, via your smartphone or tablet. 'Intelligent heating can have a positive impact on energy bills, particularly when using a multi-room set-up that allows you to create different heating zones,' says Mikael Eliaeson, senior product manager at Wiser (0333 600 0622; wiserdrayton controls.co.uk).

Connected technology can warm the house before you get home, or sense when you've left a window open, turning down the heating to save you money. 'Smart thermostats and radiator valves allow you to easily adjust the warmth in each room, precisely tailor your heating to your needs and control it while you're away,' says Rachel Cowle, marketing director at Lightwave (0121 250 3625; lightwaverf.com). »

Smart radiator thermostat starter kit, V3+, £119.99, Tado. (tado.com)

Adjust a room's temperature from your smartphone with Hive Active Heating, from £179, Hive. (0333 202 9627; hivehome.com)

Built-in systems

Heating can now be integrated into the fabric of your building. Developments in both wet and dry systems allow you to turn your walls, floors and even skirting boards into radiators. All of these hidden options run at lower temperatures and are energy efficient.

Ultra-thin, low-voltage, flexible meshes free up wall space, and you can even make holes in them to hang pictures. Try Thermofer (UK agent benevivere.co.uk; 020 3151 1757).

'Integrated systems are a space-saving option for smaller properties, eliminating the need for radiators,' says David Holmes MD, Solar Guide (0800 077 4138; solarguide.co.uk).

The underfloor heating system was installed between the joists and a new birch plywood floor laid over the top

PHOTOGRAPHY RICHARD LEEMEY

5 ADVANTAGES OF UNDERFLOOR HEATING

Nick Felsing of Warmup (0345 345 2288; warmup.co.uk) suggests reasons to the choose this solution

1 Energy efficient with low running costs
Underfloor heating operates at a lower temperature than standard radiators, so energy bills are reduced.

2 Design freedom
Without the clutter of radiators or fireplaces, your walls and floors are free to be used as you wish.

3 Reduced dust circulation and increased safety
The radiant heat produced reduces humidity and air circulation, resulting in fewer dust mites and allergens. There are no hot, low-level surfaces or hard metal edges, making the system more child friendly.

4 Comfort levels
Warmth from the floor gently rises. There are no cold spots and the room won't overheat, saving energy and keeping the air temperature at a comfortable level.

5 Straightforward installation
The systems are easy to install and compatible with most floor finishes.

Come in from the cold

PROJECT PROFILE

LOCATION Kentish Town, London
TYPE OF PROPERTY Victorian terrace
DURATION OF PROJECT 8 months
THE BRIEF Install an eco-friendly heating system
COST £11,900 (heating); £20,000 (insulation)

One couple invested in efficient heating and insulation for the long-term good of their house and lifestyle

James Herbertson and Aurélie Guingamp plan to live in their newly purchased four-bedroom Victorian house for many years, so they set some ambitious goals for heating the property. 'We wanted to create a beautiful family home and reduce its impact on the environment,' says James. »

By reducing the house's heating demands, the need for radiators has been kept to a minimum

The couple turned to architect Robert Prewett of Prewett Bizley Architects (prewettbizley.com). 'Period terraces are typically insulation free and, with single glazing, normally require a large boiler and radiators in every room to keep them warm,' says Prewett. But the couple's aim was to keep the heating system to a minimum. 'We aspired to a Passivhaus standard but realised that wouldn't be easy. There are few successful retrofits that achieve this,' says James.

The house was tightly sealed with a membrane around every single joint to make the building airtight, and insulated with natural wood fibre. A 12kw gas boiler – which approximates to around 50 per cent of the size usually required for a standard house of this type – and relatively small radiators were fitted.

The temperature on each floor can be controlled independently, thanks to a manifold with electronic actuators, or valves. These open and close when a particular area's thermostat demands it, and distribute hot water to the relevant radiators as needed.

'The house was made airtight and insulated with natural wood fibre, while secondary double glazing was fitted to the sash windows'

Secondary double glazing was fitted to the original sash windows, reducing heat loss and avoiding the need to replace them. 'Victorian timber tends to be more durable than modern stock. And as the frames have been well looked after, they may be good for another hundred years,' explains Prewett.

James and Aurélie have a home that's warm, eco-friendly and energy efficient. 'Above all, we love the fact that we have a cosy house that heats up quickly and stays warm,' says James. GD

ABOVE LEFT Large expanses of airtight contemporary glazing have been fitted in the rear extension

ABOVE As the property is so well insulated and airtight, the living room is kept at a comfortable temperature by one small radiator

LEFT Secondary double-glazing maintains the beauty of period sash windows while reducing heat loss

PHOTOGRAPHY ADAM PARKER