

Electric heating



Thinking about electric heating for your home? You're not alone.

Many of us are facing changes to how we heat our homes as the UK switches from gas and oil to electric heating in the coming years.

This guide will help you understand your options. It's a long leaflet, so use the table of contents to find the parts you want.

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Why switch to electric heating?

Around 90% of UK homes currently use gas or oil for heating. To meet climate targets, nearly all of this will need to change to electric heating over the next 10 to 15 years.

The benefits of electric heating:

- **A lower carbon footprint:** Switching from gas to a heat pump could cut your heating emissions by up to 70%.
- **Future-proofing your home.** You'll be getting ahead of changes that are coming anyway.
- **Grants are available now.** The Boiler Upgrade Scheme offers grants of up to £7,500 to help with installation costs.
- **Running costs are improving.** As the electricity grid gets greener and more renewable, electric heating becomes more cost-effective.

The UK now generates around half of its electricity from renewable sources, and the government has committed to making all electricity zero carbon by 2050.



What types of electric heating are available?

There are many types of electric heating to choose from. The best option for you depends on your home type, how well insulated it is, and how you use your heating. In the overview below we divide them into six types: heat pumps, underfloor heating, room heaters, night storage heaters, electric boilers and heat batteries.

Quick guide: ‘instant’ heat vs ‘storage’ heat

Instant heat

Heaters that provide ‘instant’ heat include panel heaters. These warm the room as soon as you turn them on and so are good for providing heat when you need it.

The downsides are that heat disappears quickly when turned off, and they can’t make use of cheaper night-rate electricity.

Stored heat

Heaters that provide ‘stored’ heat include night storage heaters, storage boilers and heat batteries. Once warm, heat is released slowly over a longer period even after the heater is off.

These charge up with heat (usually at night when electricity is cheaper), and are good for reducing running costs.

The downside is that they take time to warm up; you won’t feel the warmth immediately so you need to plan ahead.

Combination

Heaters that provide a combination of both ‘instant’ and ‘stored’ heat include heat pumps and underfloor heating in concrete.

These have some heat storage built in, but are more responsive than the storage heaters referred to above so will warm the room quicker. They are good for a balance of cost and flexibility.

It’s also useful to bear in mind that different heaters work in different ways. Some produce ‘instant heat’ while others produce ‘stored heat’, and others are a combination of both. For more about instant’ heat vs ‘storage’ heat, see box.

Heat pumps

Heat pumps extract warmth from the air or ground outside, concentrate it, and transfer it to air or water that circulates through your heating system. A well-designed and installed heat pump typically provides 3 to 4 units of heat for every unit of electricity used, making them the most efficient form of electric heating.

There are two main types:

1) Air-to-water heat pumps. These look like large air conditioning units placed outside your home and connect to radiators or underfloor heating. They can work with your existing central heating system.

2) Air-to-air heat pumps. These also sit outside but blow warm air directly into rooms, rather than heating water. These can work in flats and homes without space for a full central heating system. Air-to-air heat pumps can provide cooling as well – very useful in a heatwave.

A third type, ground source heat pumps, need pipes dug into the ground and are most suitable for homes with larger gardens or land.

Best for:

Heat pumps work well in most home types, but work best in buildings with reasonable insulation. Air-to-water heat pumps work well with existing central heating. Air-to-air heat pumps are suitable for flats or homes without space for an outdoor ground unit.

Installation and running cost:

Air-to-water heat pumps cost around £11,000 to install, but the Boiler Upgrade Scheme



provides a grant of £7,500. Air-to-air heat pumps are eligible for a £2,500 grant. Heat pumps cost around £800 to £1,050 a year to run making them one of the cheapest electric heating options (see table on p6).

Key thing to know:

Radiators served by heat pumps don't get as hot as radiators served by gas boilers. So if your home is draughty or poorly insulated, you may need larger radiators or underfloor heating to feel comfortable. The better insulated your home, the more efficient – and cheaper to run – your heat pump will be. You can read more about heat pumps here:

www.cse.org.uk/advice/heat-pumps.

Underfloor heating

Underfloor heating distributes heat under the floor, with individual room controls. There are two types: 'dry' systems use electric heating wires under the floor, while 'wet' systems circulate hot water through pipes, usually connected to a boiler or heat pump.

Best for:

Dry systems are usually only installed in one or two rooms that aren't used for long periods, such as kitchens and bathrooms. Wet systems work well for whole-home heating over long periods, particularly when embedded in concrete which acts as a heat store.

Installation and running cost:

The installation cost of underfloor heating varies widely depending on system type and floor area. The running costs for dry electric systems are high because they can't store heat in the same way as a wet embedded system. Wet systems can be cost-effective. In general, underfloor heating is cheaper with a single-rate tariff.

Key thing to know:

Underfloor heating takes time to warm up, especially wet systems embedded in concrete. Once warm, the heat lasts a long time after the

system is turned off. This makes it best suited to people who are home during the day and want background warmth over longer periods rather than quick bursts of heat. Note that dry electric underfloor heating can be laid on top of an existing floor rather than embedded into it – but if installed this way, it behaves more like an instant room heater and has correspondingly higher running costs.

You can read more about underfloor heating here: www.cse.org.uk/advice/underfloor-heating.

Room heaters

Room heaters cover a range of wall-mounted or portable electric heaters. They're similar to each other in terms of running cost, but the warmth and comfort you feel from them will depend on how they heat the room.

Room heaters are flexible – they can be turned on and off easily and used for short or long periods. But even if they have a built-in thermostat as many do, their high running costs make them expensive as a main heating source for a whole home except in buildings that are super insulated. It's worth knowing that a home that relies solely on room heaters will have a poor Energy Performance Certificate (EPC) rating, due to their high running costs.

When used regularly, room heaters are best run on a single-rate electricity tariff – using them on Economy 7 would mean running them during expensive on-peak hours.

All electric room heaters convert electricity directly into heat, so a heater with a higher power rating will use more electricity but won't necessarily heat your home better than a smaller one used for longer. What matters more is how the heat is transferred into the room, how long the heater is on, and how well controlled it is.



There are three main types of electric room heater: panel heaters, infrared radiant panels and dynamic storage heaters.

Panel heaters

These are thin radiators fixed to the wall, but also available as portable heaters. They heat the air, which then circulates around the room. They're instant heaters – providing warmth as soon as they're switched on – but once turned off the room loses heat quickly.

Best for:

Panel heaters work best in homes that are very well insulated or when used to heat individual rooms for short periods. They are often used as backup heaters in homes with night storage heaters; if this is you, keep an eye on how long they're switched on as costs can creep up.

Installation and running cost:

Panel heaters cost £100 to £200 each to install. But their running costs are very high; for a typical flat that uses panel heaters this could be £1,080 a year. To keep costs down, limit how long they're switched on and make sure they have a thermostat.

Key thing to know:

Panel heaters are not economical as a permanent main heating source.

Infrared radiant panels

Infrared panels heat people and objects *directly* rather than warming the air, in the same way as the sun. This means you'll feel colder if you're not directly in front of the panel – like sitting in the shade.

Best for:

Infrared radiant panels work best in homes where people spend a lot of time sitting in one place rather than moving around, or very draughty homes where warm air would quickly be lost.

What do they cost to install and run?

Infrared panels cost £100 to £200 per heater to install. Their running costs are similar to panel heaters: around £1,080 a year for a flat.

Key thing to know

If your home has damp or mould issues, this type of heating is not recommended because it can make the problem worse. The reason is that infrared panels don't heat the air, and if the air stays cold, moisture will condense more easily on cold surfaces like walls and windows.

Dynamic storage heaters

Dynamic storage heaters are a type of panel heater with a small built-in heat store. They are not to be confused with night storage heaters, although both are sometimes called 'storage heaters'. Unlike night storage heaters, they don't charge up overnight on cheap electricity. They provide instant heat on demand, with the small heat store helping to maintain temperature without using electricity constantly.

Best for:

People who want some of the flexibility of instant heat, with slightly lower running costs than standard panel heaters.

What do they cost to install and run?

Dynamic storage heaters cost £400 to £600 per heater to install. Their running costs are around £1,080 per year for a flat. That's similar to other room heaters, as they cannot take advantage of cheaper night-rate electricity.

Key thing to know

The built-in heat store, combined with a thermostat, means the heater doesn't run continuously; the stored heat does some of the work. However, running costs are still higher than night storage heaters because they don't work with Economy 7.



Night storage heaters

Night storage heaters are wall-mounted units that consume electricity over several hours at night, storing the energy in the form of heat in a bank of clay or ceramic bricks. This heat is released slowly the following day. They should always be used on an Economy 7 tariff to take advantage of cheaper overnight electricity. When controlled correctly, they are one of the cheapest electric heating methods available.

Best for

They work best in small to average sized homes with good insulation and draught-proofing. They are particularly good for people who are home during the day and can plan their heating need ahead of time.

What do they cost to install and run?

Night storage heaters cost £200 to £800 per heater depending on type. Typical running cost is £912 a year for a flat, depending on type of heater. This is significantly cheaper than room heaters when used correctly on Economy 7.

Key thing to know

You need to plan ahead, deciding how much heat you'll need the following day.

There are three main types of night storage heater, with important differences:

1) Traditional night storage heaters

This is the oldest type, and the one most difficult to operate. You need to manually set both how much heat to store overnight and when and how much to release during the day. Traditional models often have poor insulation, which means they slowly lose the heat they've up stored heat before you need it. If the stored heat runs out by evening, you may need to use more expensive room heaters to top up.

2) Integrated night storage heaters

These combine the economy of night storage heaters with the flexibility of instant heating. They include a boost function for when stored heat runs out – though be aware this uses more expensive on-peak electricity. Some models include a digital programmer that automatically calculates how much to charge overnight based on the temperature you want, making them much more hands-free to operate. If controlled well – using mainly off-peak electricity rather than the boost function – running costs should be lower than the figure we cite on this leaflet.

3) High heat retention storage heaters

This is the most efficient type of night storage heater. It has better insulation to keep heat stored for longer, a thermostat to maintain the target room temperature, and a fan to release heat evenly. It is more expensive to buy but cheaper to run than traditional or integrated models – assuming that most of the space heating demand is switched to the off-peak tariff. This makes the high heat retention storage heater the most cost-effective long-term choice if night storage heaters are right for your home.

Electric boilers

Electric boilers heat water using electricity rather than gas, and are designed to work with existing radiators or underfloor heating. There are two types:

1) Flow boilers. These heat water on demand as it passes through an electric immersion element – similar in principle to how the immersion heater you may already have in your hot water tank works.

2) Storage boilers. These store heat in a water tank or ceramic bricks surrounded by water pipes, to be released when the heating is turned on.

**Best for:**

Electric boilers are suitable for residents who want to keep their existing central heating system and radiators but move away from gas. Particularly useful where a heat pump isn't suitable.

What do they cost to install and run?

Electric boilers cost: £3,000 to £6,000 to install. Flow boilers cost around £3,220 a year on a single-rate tariff for an average home. Storage boilers around £2,689 per year on Economy 7 for an average home. Both can be expensive to run; more expensive than heat pumps.

Key thing to know

Flow boilers use electricity the moment it's needed, making them extremely costly to run if not carefully controlled. They are likely to be slightly cheaper on a single-rate tariff than Economy 7, as they'll be running during on-peak hours anyway. Storage boilers can take advantage of cheaper off-peak electricity but must be correctly sized to your home and heat demand, and the system must be well insulated, otherwise they may struggle to heat your house adequately.

Heat batteries

Heat batteries are similar in size to a regular boiler, but with a ceramic thermal core that can store large amounts of heat. They are very well insulated, keeping heat stored for longer periods. Heat batteries connect to an existing wet central heating system via a heat exchanger and run at 55 to 60°C meaning they don't usually require the radiator upgrades that heat pumps often need.

Best for

Heat batteries are most suitable for smaller homes that don't have space for an outdoor heat pump unit. They have a maximum output of around 12,000 kWh a year – similar to the average UK home's heating demand – so they're

not suitable for larger homes or those with high energy consumption. The unit itself is very heavy, so may not be suitable for all floor types.

What do they cost to install and run?

The installation cost of heat batteries varies, but they are eligible for a £2,500 grant through the Boiler Upgrade Scheme. Lower running costs are achieved by using an off-peak electricity tariff to charge the battery. A typical cost is around £1,770 a year for an average home on Economy 7 or an off-peak tariff.

Key thing to know

Heat batteries are a newer technology and a good option for homes where a heat pump won't work, particularly smaller properties without outdoor space. The cost savings depend entirely on using an off-peak tariff, so make sure this is in place before installation.

Which electric heating system is best for my home?

Choosing the right electric heating depends on your home type, how well insulated it is, and how you use your heating. Before deciding, consider the following:

- How well insulated is your home?
- Are you home during the day or mainly evenings?
- Do you have outdoor space for a heat pump unit?
- Can you plan your heating a day ahead?
- What's your budget for installation?
- Are you eligible for a grant?





Costs at a glance

The table below compares the cost of different electric heating systems. These are approximate costs for heating an average flat or small home; your actual costs will depend on the size of your home and how well insulated it is, what electricity tariff you’re on, how you control your heating, and whether you qualify for grants.

Heater type	Tariff	Annual space heating cost (average)	Cost to install (approx)
Heat pump	Single-rate	£800 to £1050	£6,000 to £18,000
Panel and infrared	Single-rate	£1,080	£100 to £200 per heater
Dynamic storage heater	Single-rate	£1,080	£400 to £600 per heater
Night storage heater (traditional)	Economy 7	£912	£200 to £400 per heater
Night storage heater (integrated)	Economy 7	£711	£600 to £800 per heater
Night storage heater (high heat retention)	Economy 7	£676	£400 to £800 per heater
Electric boiler	Economy 7	£2,690	£3,000 to £6,000
Electric boiler	Single-rate	£3,220	£3,000 to £6,000
Heat battery	Off-peak tariff	£1,774	*

* The installation cost of heat batteries varies, but they are eligible for a £2,500 grant through the Boiler Upgrade Scheme.

How did we calculate these costs?

Running costs are based on the price cap tariff for standard electricity of 27.69p (March 2026) and on Ofgem’s typical domestic consumption values of 11,500 kWh for an average home and 3,900 kWh for a flat. Economy 7 tariffs are assumed to be 34.38p for on-peak and 15.43p for off-peak, with a 58:42 split. Integrated storage heaters have an assumed 85:15 split, and high heat retention storage heaters have an assumed 90:10 split.

In summary:

Heat pumps and night storage heaters are cheapest to run when used with the right electricity tariff.

Panel heaters are cheap to buy but expensive to run; they’re only cost-effective when used occasionally.

Grants can significantly reduce installation costs.

Grants and support

Boiler Upgrade Scheme

This is a government grant that helps with installation costs for low-carbon heating, specifically, £7,500 for an air-to-water heat pump or ground source heat pump, and £2,500 for air-to-air heat pumps and heat batteries. You can apply if you’re replacing fossil fuel heating (gas, oil, LPG) in England or Wales. Your installer will help you apply.



Energy Company Obligation

This offers grants for insulation and heating if you're on certain benefits or have a low income. Contact your local council to find out if they're taking part in the scheme, or contact an energy supplier directly.

Local council schemes

Some councils offer additional grants or support. Sometimes this is done through Warm Homes: Local Grant which offers free energy-saving home improvements if you're on a low income, get certain benefits or live in a certain area

If you don't want to apply for a grant or aren't eligible for one, there are several things you can do to save money on electric heating:

- ➔ Switch to the right tariff. For storage heaters, Economy 7 or Economy 10.
- ➔ Improve insulation first. This makes all heating systems cheaper to run.
- ➔ Use controls properly. Thermostats and timers can cut costs significantly.
- ➔ Consider solar panels. If suitable, they can reduce electricity costs.
- ➔ Talk to us. The Centre for Sustainable Energy's offers free, impartial advice that can help you work out what's right for your home and what grants you might be eligible for. Call us free on **0800 082 2234**, or email home.energy@cse.org.uk.

Key things to remember

Electric heating is coming; most UK homes will need to switch in the next 10 to 15 years.

Night storage heaters are a cost-effective option if you can plan ahead and use Economy 7.

Insulation matters; better insulation makes any electric heating cheaper and more effective.

Heat pumps are usually the cheapest to run, especially with the right tariff.

Panel heaters are flexible but expensive, best for occasional use, not whole-home heating.

Grants are available now; don't miss out on support with installation costs.

► This factsheet was updated in October 2025, using information, including energy prices, current at that time ◀

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We're a charity (298740) supporting people and organisations across the UK to tackle the climate emergency and end the suffering caused by cold homes.

St James Court, Bristol BS1 3LH
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We offer free advice on domestic energy use to people in central southern and southwest England.

Contact us:

0800 082 2234

home.energy@cse.org.uk

See all our energy advice pages at www.cse.org.uk/advice