

Heat Pump  
Edition

# Buying a new low energy home



# Thank you for considering a brand new, low energy home

Rest assured it comes with  
all the latest mod cons – and  
here's a short guide on how  
to get the best out of them.



This guide provides general information for common home designs and low carbon technologies. Please always refer to the home user guide, provided with your home, for specific details.



A guide from the Future Homes Hub and MCS

# You'll feel the benefits from Day One



## New homes today have come a long way from those built historically.

Gas boilers are out. Heat pumps are in as are many other new features. You should find that what you spend on fuel is lower than a similar older home – not least because you only have one bill now (for electricity, not gas).

You are also helping to save the planet. Your new home incorporates the latest technology designed to reduce energy use and carbon footprint.

## Your new home has been designed with energy efficiency at its heart to...



Provide a comfortable and healthy environment



Reduce your energy use with fuel bills in mind



Tackle climate change by cutting carbon emissions



Improve the country's energy security



# Features of a low energy new home

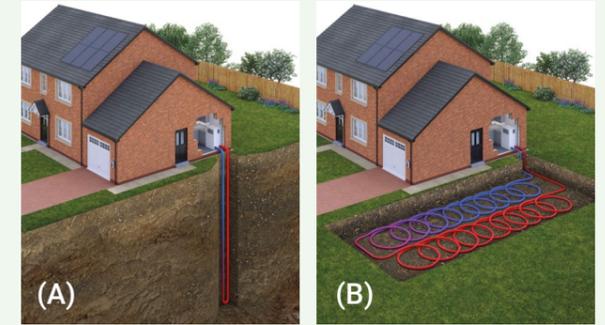
Below are examples of some of the features you may have in your new home.

- 1 Raised loft storage area
- 2 Well insulated building fabric
- 3 Trickle vents
- 4 Extract fans
- 5 Aerated shower
- 6 Aerated taps
- 7 Low flush toilet
- 8 Hot water store
- 9 Air source heat pump
- 10 Underfloor heating



- 11 Room thermostat
- 12 Internal door undercuts
- 13 Solar panels
- 14 LED lighting
- 15 Warm (rather than hot) radiators
- 16 Thermostatic Radiator Valves (TRVs)
- 17 Electric car charging point
- 18 High performance glazing
- 19 Airtight external doors
- 20 Comfortable room temperatures

You may have a ground source heat pump in your home - most commonly from either a borehole (A) or 'slinky' (B) system.



# Features of a low energy new home

## Well-insulated building fabric:

The walls and roof are well insulated. Windows and doors have high-performance glazing and close tightly. This all means that less heat leaks from your home and it cools down more slowly.



When you buy a low energy home, you'll receive a home user guide. Take a look at its advice on how to maintain your ventilation systems and ensure a healthy home.

## Healthy ventilation:

Fresh air comes into the home through trickle vents or inlet ducts. Stale, moist air is removed through mechanical extraction, particularly via extract fans or ducts in kitchens, bathrooms, shower rooms, utility rooms and toilets. These help control humidity and remove stale air.

To allow the fresh air to move through your home, there is a gap at the bottom of internal doors – this is intended and important to maintain when you come to replace floor coverings.

Trickle vents, if fitted to windows, are there to allow fresh air in. On particularly windy days, if you feel a draught, they could be closed temporarily. But they should then be re-opened.

In the winter you will be more comfortable and save money if you keep windows and doors closed as much as possible. In the same way, if you like to 'air' your home periodically (and it is secure to do so) windows only need to be open for a few minutes and then can be closed again to keep the heat in.



# Features of a low energy new home

## Low carbon heating system:

The Government is banning fossil fuel (gas and oil) boilers in new homes from 2025, so it will become common to see a heat pump in a low energy new home instead. Indeed, it is expected that fossil fuel boilers will be phased out for existing homes too.

Both air source and ground source heat pumps will have similar hot water cylinder and controls inside the home. The main difference is that an air source heat pump will have a box outside the home.

Heat pumps are at their most efficient when gently working over long time periods rather than stop/start. Think of your heat pump as a gentle long jog, rather than a boiler doing continuous short sprints and regular stops. Both get to the same point, just differently.

To maximise the efficiency of modern heating systems the temperature of the radiators will be lower than you may be used to but your home will still be as warm.

## What is a heat pump?

A heat pump takes the heat energy from outside air (even on a cold day) or from the ground and concentrates it into usable heat for your home, warming radiators or underfloor heating systems. Heat pump systems require a cylinder in your home to store hot water. Although a heat pump uses electricity, most of that energy comes from the air or ground which makes it very efficient – 3 or 4 times more efficient than boilers.



## Appliances:

Your hob and oven will be electric. You should discuss with your builder if you have any questions about other appliances.

## Energy-generating solar PV panels:

If you have solar panels, these allow your home to produce renewable electricity to run your electrical appliances, your heating, and even help charge your electric car if you have one.

To make the most of this self-generated electricity from your solar panels, try to use energy-hungry appliances like tumble dryers, washing machines and

dishwashers, during the middle of the day whenever you can. In the spring and summer, when the heating is not on, you could set your hot water to reheat during the day, using the free electricity from your solar panels.

Most electricity providers will pay you if you don't use all the electricity your solar panels generate and you export it back into the national grid instead. You can shop around for the best deal on this. But even though you can sell the surplus back to the electricity grid, you will be better off using as much of the electricity you generate yourself.

# Features of a low energy new home

## Controls put you in charge:

If you want to maintain a warm home, then two temperatures need to be set – your 'comfort temperature' when you are in and a 'setback temperature' when you are out.

If you want to switch the system off completely when you are out, then the controls are set in the same way as you might use a boiler. Just remember it will take longer to heat back up than you are used to.

With all new homes, you will be able to set both the time and temperature at a controller and may also have thermostatic radiator valves or room specific controls to regulate the temperature in most rooms. You may also have a 'smart' thermostat that allows you to control your home's temperature from your phone.



**If in any doubt, or if you just want more detailed information, consult your new home user guide and heat pump user guide.**



## Hot water stored for use:

You might not have had a water cylinder in previous homes. But as heat pumps work more slowly than boilers your home's hot water is stored in a cylinder ready for use, and that cylinder might be larger than you are used to, just to ensure there is enough hot water available.

The water is nice and hot for washing the pots and pans but is not quite as hot as you might be used to from boilers.

If you run short of hot water, you can use an immersion heater to quickly heat more up. However this is three times more expensive than allowing the heat pump to do its job, so use immersion heaters sparingly.

When the heat pump is charging the hot water tank, it is not sending hot water to the radiators. So in the winter, it makes sense to schedule the recharge of the hot water cylinder when the heating requirement is low - such as when the home is unoccupied or during the night. If you have time of use energy tariffs then this is also a consideration for when to recharge your cylinder.



## Electric car charging point:

Many homes come with an electric vehicle (EV) charging point, making you future-ready as the phase-out date for the sale of new petrol and diesel cars and vans is to be brought forward to 2030.

# How to run your heating efficiently

## How you use your heat pump most efficiently depends on how much you are at home:

### In the house most days?

Many people want a warm home in the morning when they get up and in the late afternoon ready for the evening.

You have full temperature control at your fingertips. Low energy new homes are designed to provide a comfortable ambient living temperature with no cold spots.

The lowest bills are likely to be achieved by only letting the temperature fall a little during the day and maintaining a more consistent temperature than you may be used to. You can keep the heat pump ticking over in 'idle' mode, only coming on if the temperature starts to fall too far. In other words, the system won't let the home get too hot or too cold. Nice and gentle, that's the secret.

### Out and about most days?

If you spend little time at home – rushing out in the morning and coming back late – it may be more efficient to run the system similar to one with a boiler.

Switch it off overnight, don't heat the home in the morning, and set the controls to re-warm it before you get back. You will find the system takes longer to warm up than you may be used to with a boiler, but your home shouldn't get so chilly in the first place because it's so well insulated.

### Out during the week and mostly home at weekends?

Your home's controller will have a seven-day timer so the schedules described above can be set for different days as appropriate.

### How about holidays?

When you're heading off on holiday, you can switch off the system or select 'holiday mode' and set the controls to bring the temperature back up before you return.



### Keeping warm in the harshest winters:

Keep an eye on how long windows and doors are left open. Close your curtains when it gets dark to help reduce heat loss, even with energy-efficient windows installed.



### Keeping cool in the hottest summers:

Close blinds and curtains during the day to help keep the hot sun out. Open windows at night (where it's safe to do so) to let cooler night air in.



## 3 top tips for saving energy:

- 1 Set your thermostat slightly lower than you usually would and see how it feels. If everyone in your home is comfortable with the new temperature, try sticking with this. Turn the radiators down and keep the door closed on rooms that you are not using. All these will save on your heating costs.
- 2 Solar panels don't need full sun, just decent daylight. When it's bright, your solar PV system will generate its maximum output. Use as much of this self-generated electricity as possible to minimise the amount of electricity you have to pay for.
- 3 Another way to reduce your energy bill is to use something called 'time of use tariffs'. A standard electricity tariff typically charges you the same price per unit of electricity all year round, day or night, also known as a fixed tariff. A time of use electricity tariff is a variable tariff, as the price of the electricity varies dependent on when in the day you use it. By using as much of your electricity during the cheaper periods, you will save yourself money.

Experience has shown that, sometimes, when people move into a new energy efficient home for the first time they don't get the full savings expected because they unintentionally overheat the home and quickly get used to high internal temperatures.

To avoid this situation, it is suggested that you set the thermostat and room TRVs to 18°C in bedrooms and 20 or 21°C in living rooms and see how you find things. If you were previously used to turning the

heating up full and still not being comfortable then remember that your new home is different.

If after trying this for a few days you are not warm enough, nudge the temperatures up by 1/2 °C or down if too warm. The key is to use little steps and allow a few days to get used to the change before making another adjustment. This way you get the benefit of lower energy bills and keep your home comfortably warm but not too hot.

# Frequently Asked Questions

## As electricity is more expensive than gas, will my bills be higher?

Although the cost of electricity is higher than gas, a heat pump is much more efficient than a gas boiler – typically 3 or 4 times more efficient – which means you don't have to buy so much energy. Less of the heat in your home is leaking out and being wasted because of increased insulation and airtightness. Also, there are the benefits of having solar panels. In a low energy new home there is only one energy bill. That means only one standing charge. The combination of all these things should mean that your home costs less to run.



## Why does steam come out of the air source heat pump on cold days?

Ice can build up on your air source heat pump during colder days/nights, stopping it from doing its job properly. To prevent this, the heat pump will heat the outside unit slightly to melt any ice before continuing to heat your home. During this ice-melting process, you may notice steam or water vapour. This is nothing to worry about.

## Why is my hot water hotter once per week?

Once a week you may notice a slightly higher hot water temperature. This is when the hot water system runs at a higher temperature to sterilise the system. This happens automatically and is completely normal.

## Can I dry clothes on the radiators?

It is generally not good practice to dry clothes on radiators, whatever heating system you have. This can reduce the efficiency of the heating and increase running costs. It also increases humidity levels in rooms that don't have extract fans, which can lead to mould growth. It's far better to air dry clothes by hanging them up outside, or in wet rooms (bathroom or toilet), or by using a condensing tumble dryer.



## Can I cover the external heat pump?

If your home has an air source heat pump, then the outside unit needs lots of airflow around it. Avoid putting anything on top or leaning anything against the unit, such as gardening equipment or bikes, as this can reduce the air flow and may cause nuisance noise from vibrations.

## What servicing is needed for heat pumps?

To help your heating system run efficiently and extend its life, your heat pump, cylinder and heating system should be serviced every year, just as you might expect with a boiler. Consult your home user guide for details.

## What maintenance should I do myself on the heat pump?

A heat pump is a hands-off appliance so you should not need to do any maintenance yourself. Always leave it to a trained professional. With an air source heat pump, however, you should clear any debris such as leaves or twigs that get caught on the outside of the unit near the fan.

## Do heat pumps last as long as boilers do?

Generally, heat pumps can last as long or longer than boilers. Regular servicing and maintenance will ensure the longest life.

# Here's why a low energy new home is so important for our children's future:

Homes account for approximately 20% of emissions and 35% of energy demand in the UK. The government has committed to net-zero carbon emissions across the entire economy by 2050 (and five years earlier in Scotland).

Energy efficient new homes are a key part of the drive to achieve this. Reducing the amount of fuel needed to run our homes directly leads to reduced carbon emissions.

The UK electricity grid is decarbonising all the time, thanks to technologies such as wind turbines, solar and nuclear power, all of which produce no or very little carbon emissions for the electricity supplied.

That's why we want to make the most use of electricity to heat our homes instead of gas.

The government is banning fossil fuel boilers in new homes from 2025. Their use in existing homes will also be phased out in the future.



## Low energy homes are the future for Britain and will make a difference for generations to come.

## Further information:

[In-depth guide to heat pumps](#)  
by the Energy Saving Trust



[Information on solar panels](#)  
by the Energy Saving Trust



[Information on heating controls](#)  
by the Energy Saving Trust



[Information on energy efficient appliances](#)  
by the Energy Saving Trust



[Guidance on using ventilation, heating and renewable energy systems](#)  
by the NHBC Foundation



### Glossary

**Building fabric** - the roof, floor, walls, windows and doors. Improving the energy performance of these elements reduces the heat leaking out of the home in the winter, helping you stay warm but also keeping you cool in summer.

**Energy tariff** - The set rates that you pay to your energy provider for gas, electricity or both. They come in two basic types: fixed or variable.

**Heat pump** - an electrically-powered unit that extracts low grade heat from the air, ground or a local water source and converts it to a higher temperature to generate heating and hot water for your home.

**Solar PV (photovoltaic) panels** - sitting on your roof they are a technology that enables the conversion of light into electricity.

**Thermostatic radiator valves** - automatically adjust the flow of hot water that comes into your radiator to ensure the room is at the temperature you want it. You can control the temperature in each room individually.

**Trickle vent** - horizontal covered opening that usually sits at the top of a window frame. Its job is to let fresh air 'trickle' in and move stale air out of your home without having to open the window.



Customer care contact for further queries or concerns: