



Trialling Our Homes Of The Future



Taylor
Wimpey

Building a Better World

Climate change is one of the biggest challenges of our age and we are determined to play our part in tackling it. Our purpose is to build great homes and create thriving communities, and our commitment to sustainability is key to this.

The construction sector is a major contributor to the UK's carbon footprint. By working with our suppliers and partners and identifying materials and ways of working which produce fewer emissions, we can help create positive change beyond our business.

Our trial of five prototype homes will provide significant insight into how to address major industry challenges to deliver zero carbon ready homes in line with the government proposed introduction of the Future Homes Standard in 2025.





"The launch of our zero carbon ready homes at Sudbury marks an important milestone in helping us identify the best ways to reduce the energy use of our homes as well as identifying the challenges that will need to be overcome to do so at scale. This is a critical step in our journey to ensure we deliver on the UK's net zero ambitions as well as deliver the new homes the country desperately needs.

The introduction of the Future Homes Standard and the UK's ambition to be net zero carbon by 2050 requires big changes across the economy, including to our homes and developments. We have set out our Net Zero roadmap, which will ensure Taylor Wimpey reaches net zero five years ahead of the government's target. We are proud to be collaborating with our subcontractors and supply chain partners through the full lifecycle of this trial development - from concept to customer experience - to create a sustainable blueprint for delivering customer-focused, zero carbon ready homes that are deliverable at scale."

Jennie Daly,
Chief Executive



Committed to Net Zero

At Taylor Wimpey we want to help create a greener, healthier future for customers and the planet.

In early 2023, we launched our net zero goal and published a detailed transition plan and roadmap based on the latest science, setting out the changes we'll make in our business, supply chain and the homes we build.

We know that living more sustainably is important to our customers and communities. With our net-zero target, we will make zero carbon-ready homes more accessible – helping more people to reduce their energy use and carbon emissions at home. We launched our ambitious net zero goal in 2023, but our commitment to tackle climate change isn't new. We've already reduced emissions from our operations by more than half since 2013.

By doing this we can help create positive change beyond our business.

Our Net Zero targets

Our main target

By 2045 we will reach net-zero greenhouse gas emissions (*Scope 1, 2 & 3) across our value chain on a 2019 base year¹ (comprising at least a 90% absolute reduction and neutralising residual emissions).

90%

Absolute reduction in our emissions by 2045

Our supporting targets

By 2025 scope 1 and 2 GHG emissions will be reduced by 36% per 100 m² of completed floor area against a 2019 base year.

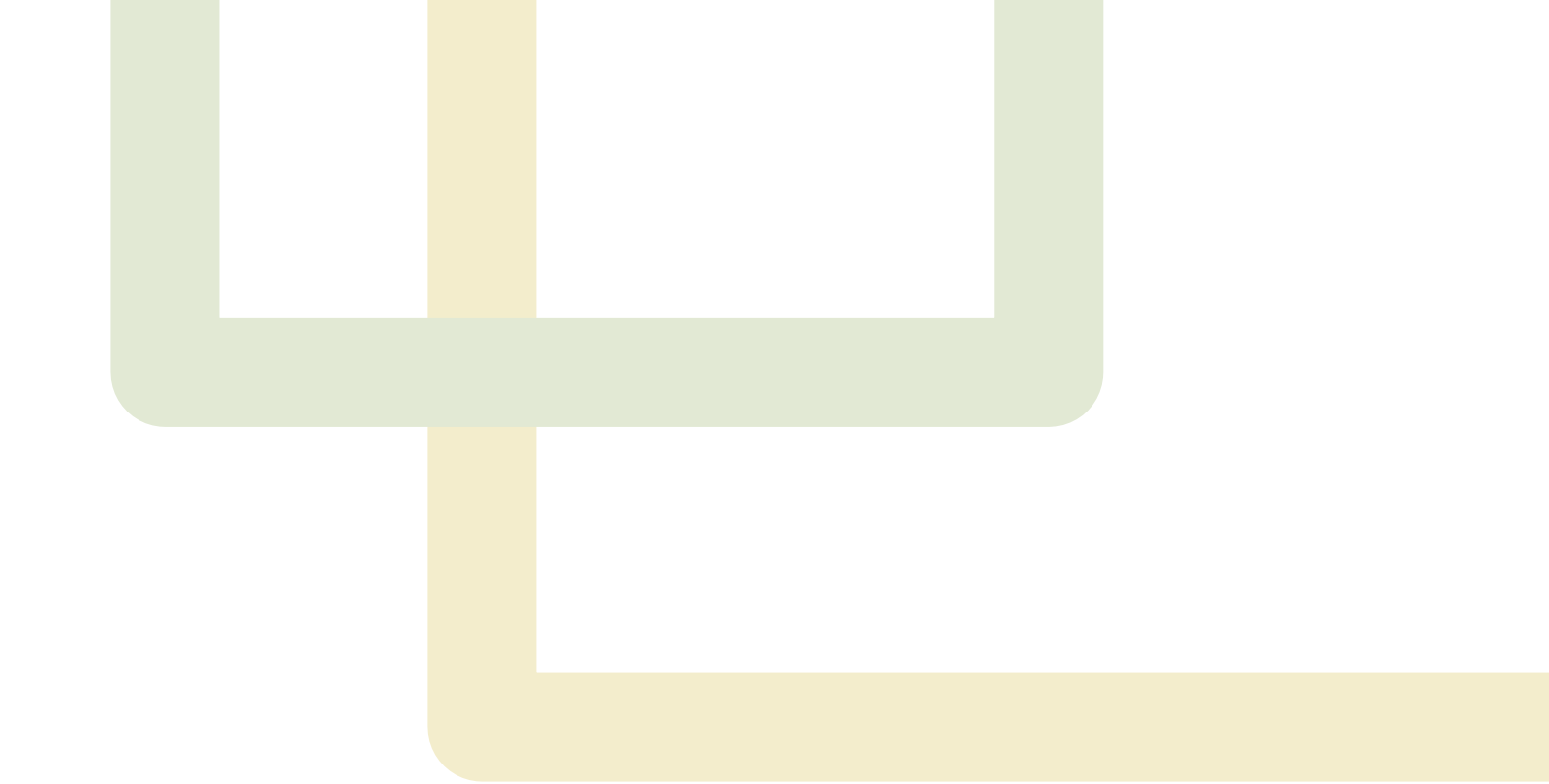
36%

per 100 m² of floor area reduction by 2025

2025

¹ 2019 was selected as our baseline when we set our first science based target validated by SBTi

*Scope 1, 2 and 3 is a way of categorising the different kinds of carbon emissions a company produces



By 2030 all our homes will be zero carbon ready (becoming true net-zero on decarbonisation of the electricity grid).

By 2030 scope 3 GHG emissions will be reduced by 52.8% per 100 m² of completed floor area from a 2019 base year (based on a reduction of 46.2% in absolute emissions against the base year).

By 2035 scope 1 and 2 GHG emissions will be net-zero.

52.8%

per 100 m² of floor area reduction by 2030

We will meet our targets by reducing absolute emissions by at least 90% and will neutralise up to 10% of emissions through the removal and storage of carbon from the atmosphere, in line with SBTi requirements.

2030

2035

2040

2045

certified by the SBTi.

Company creates in its own operations, and in its wider value chain.



The Future Homes Standard

It is anticipated that, in 2025, the Government will make a major update to the standards for new build homes - the Future Homes Standard - designed to increase energy efficiency and reduce greenhouse gas emissions. The ultimate goal is to help the UK reach its national net zero target.

In line with the Government's Future Homes Standard proposals which were consulted on at the end of 2019, new build homes will be 'zero-carbon ready'. This means that they won't use fossil fuels for heating or cooking and, once the UK's electricity grid reaches zero carbon in 2035, in line with the Government's projected target, they will produce zero carbon emissions.

The journey to 2025 Future Homes Standard (FHS) and beyond is one of the biggest regulatory changes our industry has faced for many years, and will require a generational step change in the way homes are built and used.

Our innovative trial seeks to test and better understand how the industry may deliver homes compliant with the incoming FHS, as well as helping our customers live a more sustainable lifestyle.



Trialling our Homes of the Future

Whilst our homes are already highly energy efficient, we're working hard to prepare for the incoming FHS changes.

We're testing a wide range of new technologies and fabric solutions in five trial prototype homes at our development in Sudbury. These new technologies and solutions will help us find ways to enable our customers to live in a more sustainable way, in homes that are heated more efficiently, with less impact on the environment.

The trial seeks to find possible solutions that the industry might be able to use in future homes to help them become more compliant with the anticipated FHS. It aims to explore the use of varying technologies, such as heat pumps, waste water heat recovery, photovoltaic panels with battery storage and infra-red panel heating. We have challenged ourselves and worked closely with our supply chain partners, engineers and energy experts to use cutting-edge products, such as an industry-first installation of a roof-mounted air source heat pump on one of the homes.

The homes have been designed to be sold and lived in and we will collate customer feedback to measure the

performance of the new technologies and ensure they are easy and efficient to use in everyday living. The results of our post-occupancy research along with the lessons learnt from the procurement and construction part of the trial will allow us to accurately assess performance through the full lifecycle of a development: from concept to customer experience.

The customers in our prototype homes will be asked to provide us with up to date billing information and feedback on their experience living in the home, so that we can continue to monitor performance over a period of time.



“Ultimately, the aim is to find solutions to enable Taylor Wimpey to build high quality, low carbon homes that our customers will enjoy living in. We believe that the only way to understand how these technologies interact, impact and influence each other is to build them into a home.”

**Richard Kinloch,
Head of Research and Technical Innovation**



Our Enhanced Building Fabrics

The first point to address when building an energy efficient home is the fabric of the building itself - the walls, doors, windows, roof and floors - sometimes referred to as the building envelope. Ultimately the core fabric will remain in place for the entire lifespan of the building. We take a fabric first approach to ensure that all homes minimise heat loss. We insulate our homes well and make sure they achieve good air tightness levels with the appropriate ventilation.

By carefully selecting the materials we use, and paying attention to the design of junctions, we can reduce the loss of heat from the inside of the home and through its fabric to the outside.

Focusing on the building fabric will reduce the demand for space heating in our homes, in turn reducing the energy they use.



A-rated front doors

Highly insulated front door maximizing heat retention.

A-rated front doors include more insulation than less efficient alternatives and help to reduce the amount of heat that is lost from inside the home.

Timber frame or block build with enhanced walls

Our timber frame and masonry approaches to construction of the homes at Sudbury provide a low U-value. A U-value provides a measure of the transfer of heat through the fabric of the home, (with lower U-values corresponding to higher thermal efficiency.)

Our timber frame home achieves this by using an enhanced wall design with a secondary layer of insulation. In our masonry approach, the same level of efficiency is delivered by increasing the cavity wall insulation.

Careful consideration has been given to thermal bridging junctions to further reduce heat loss and, combined with lower air tightness levels and appropriate ventilation systems, means the homes are more efficient.



Thermal lintels

A beam placed across doors and windows to support the load from the structure above and which significantly reduces the passage of heat.

Thermal lintels are up to five times more thermally efficient than a steel lintel and have an integrated polymer isolator which helps to significantly reduce thermal bridging and subsequent heat transfer from inside to outside.



Triple glazing

Uses three layers of glass to deliver maximum heat retention.

Triple glazed windows use three panes of glass to reflect more heat back into your home and prevent it from escaping. In addition to the meaningful thermal benefits, triple glazing also helps reduce the risk of overheating which in turn adds to comfort levels in the home. The introduction of triple glazing is seen as a real benefit for customers and is uncommon in new build homes at present.

1 Thermal Lintels

2 A-Rated Front Door

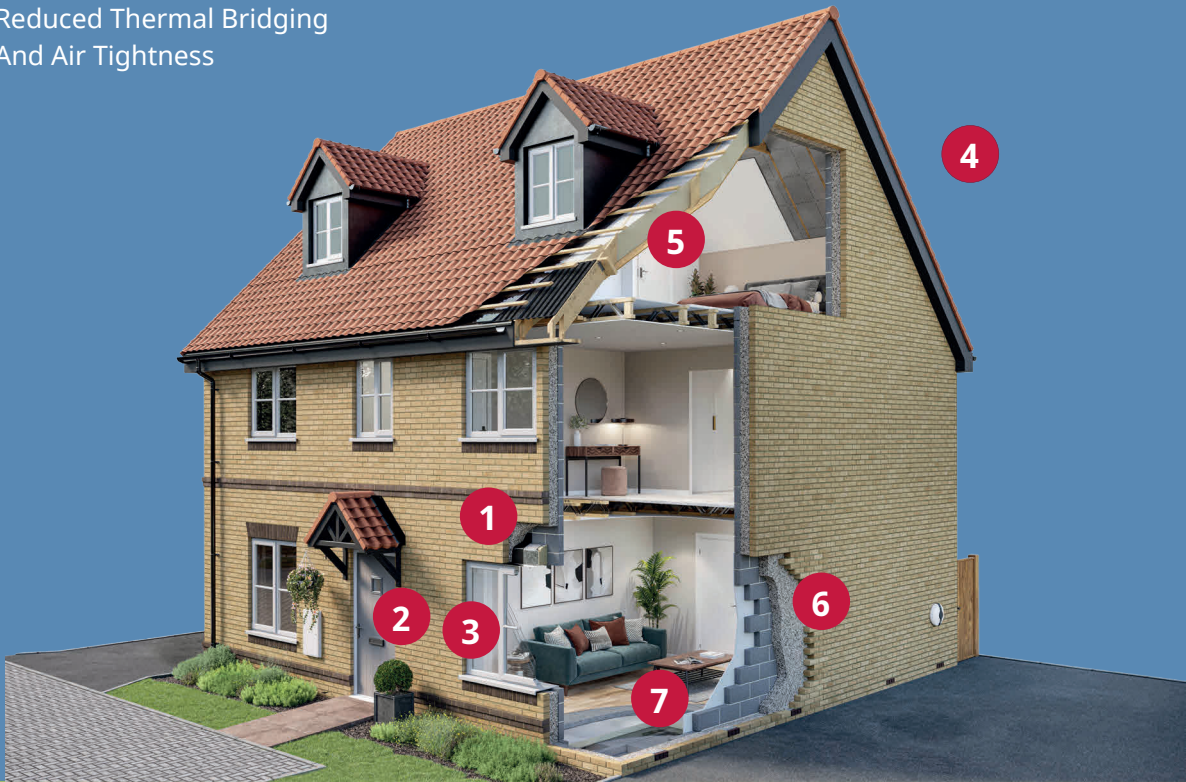
3 Triple Glazing

4 Reduced Thermal Bridging And Air Tightness

5 Insulated "Smart Roof" System

6 Block Build With Enhanced Walls

7 Insulated Beam And Block Floor



1 Reduced Thermal Bridging And Air Tightness

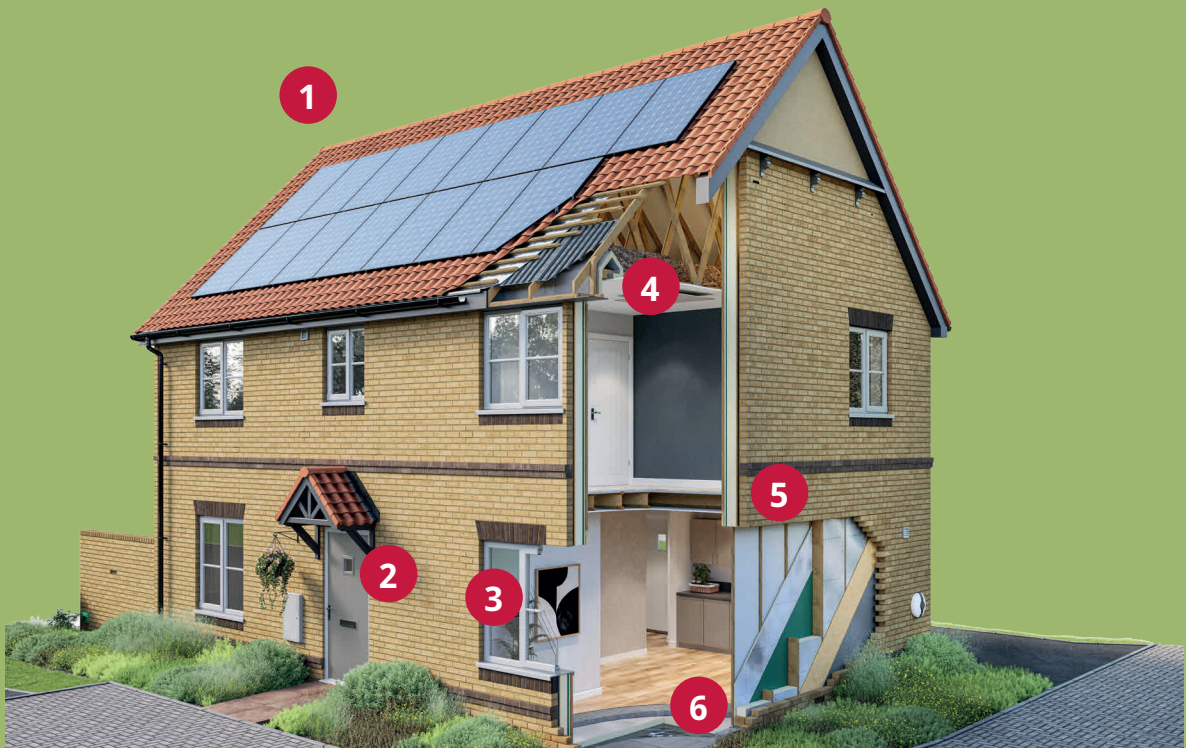
2 A-Rated Front Door

3 Triple Glazing

4 Layers Of Loft Insulation

5 Timber Frame With Enhanced Walls

6 Insulated Beam And Block Floor



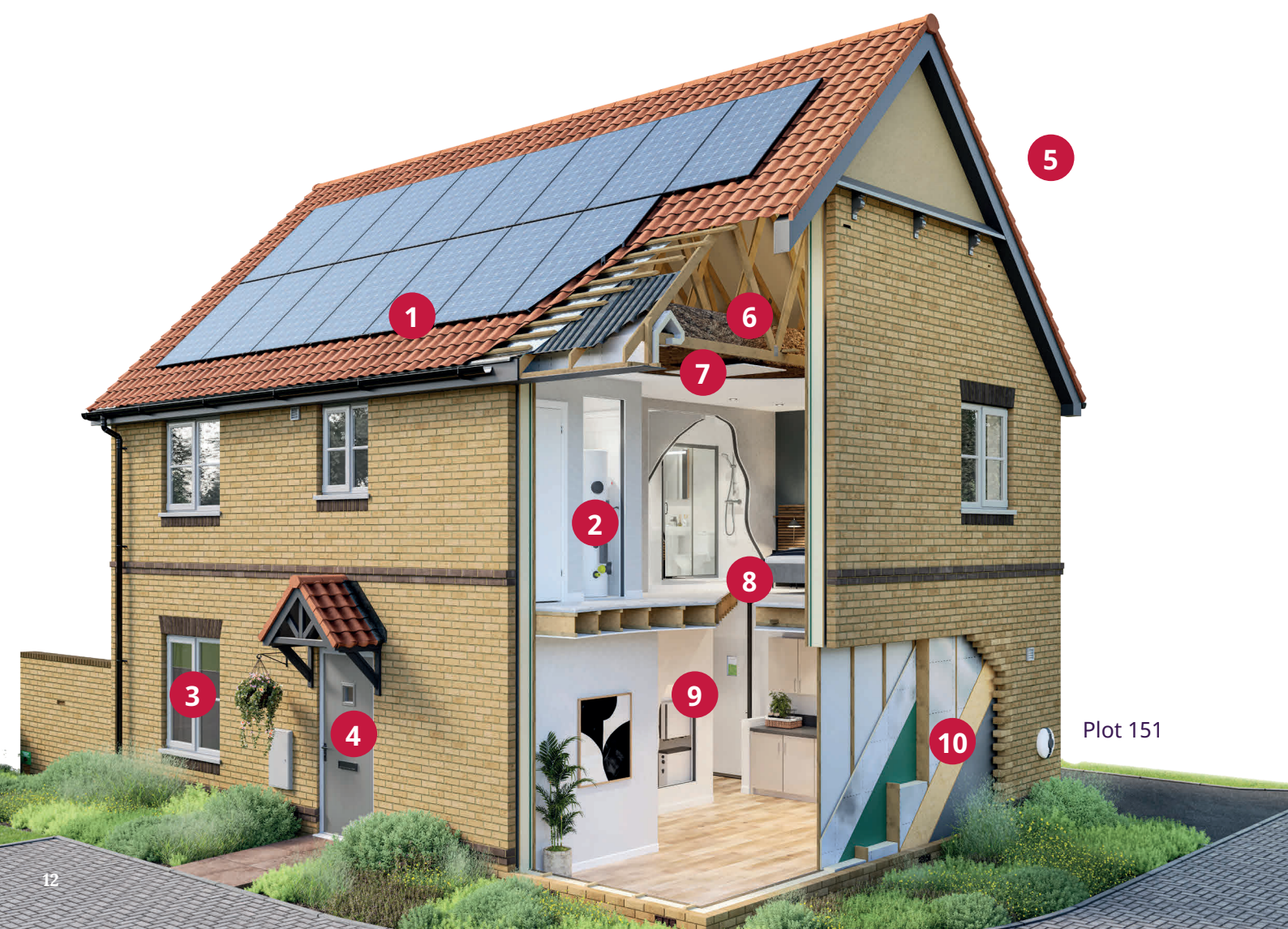
Our Prototype Homes

Whilst our homes are already highly energy efficient, we're working hard to prepare for future changes. Our prototype homes will test different combinations of fabric and technology solutions for FHS, and explore the best way to reduce energy demand and achieve improved fabric performance in our homes.

The cross section images below show an example of the specifications that we are incorporating in to achieve Zero carbon ready homes. A full table

of technologies and fabric solutions used in each plot can be found on page 17 of this booklet.

- | | | | |
|---|--|----|----------------------------------|
| 1 | Solar PV Panels | 6 | Layers Of Loft Insulation |
| 2 | Smart Hot Water Cylinder | 7 | Infrared Heating Panels |
| 3 | Triple Glazing | 8 | Waste Water Heat Recovery |
| 4 | A-Rated Front Door | 9 | Battery Storage |
| 5 | Reduced Thermal Bridging And Air Tightness | 10 | Timber Frame With Enhanced Walls |



1 Waste Water Heat Recovery

2 Mechanical Ventilation Heat Recovery

3 Air Source Heat Pump

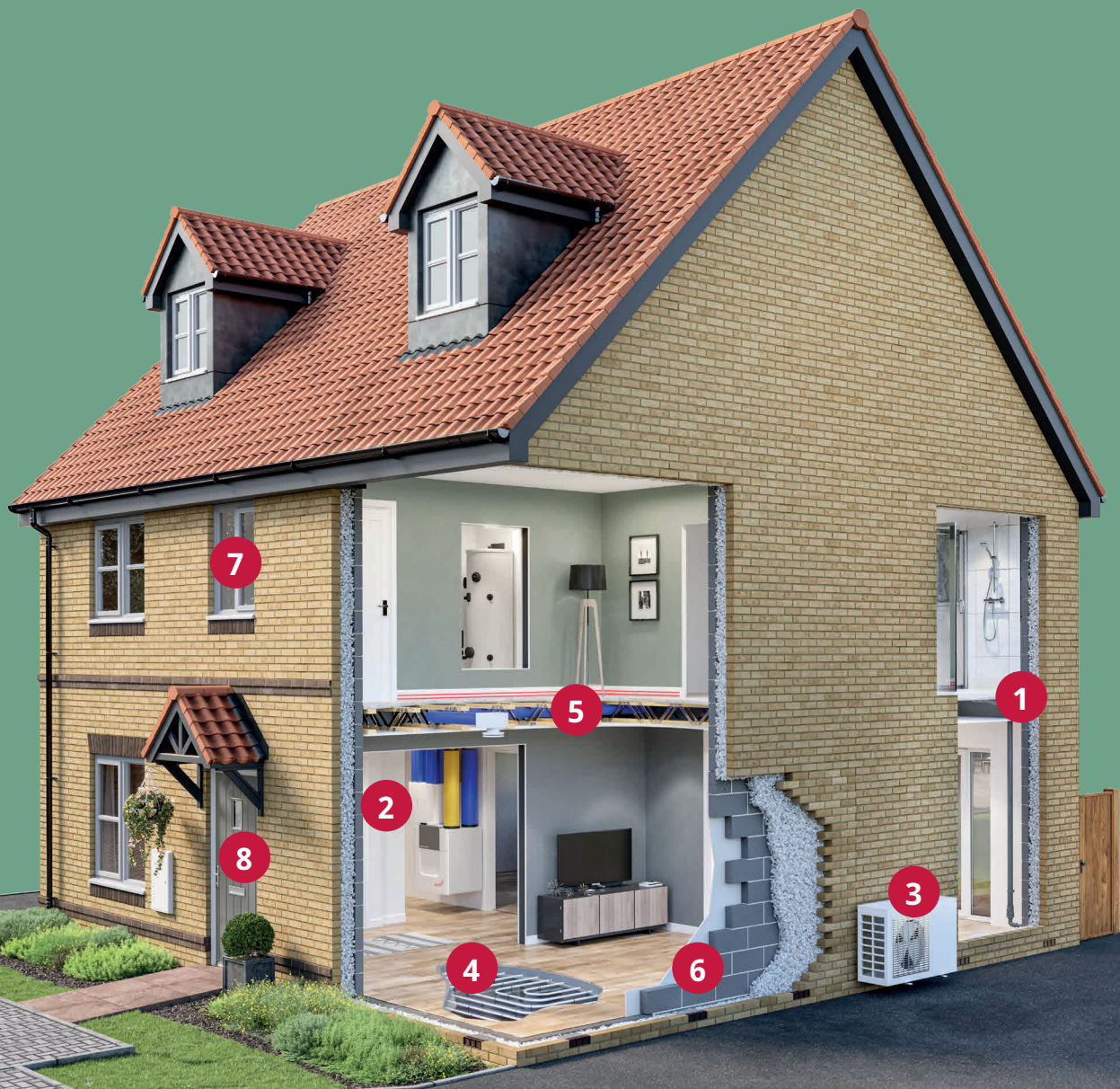
4 Under Floor Heating

5 Therma Skirt

6 Block Build With Enhanced Walls

7 Triple Glazing

8 A-Rated Front Door



Plot 153

Innovative Solutions

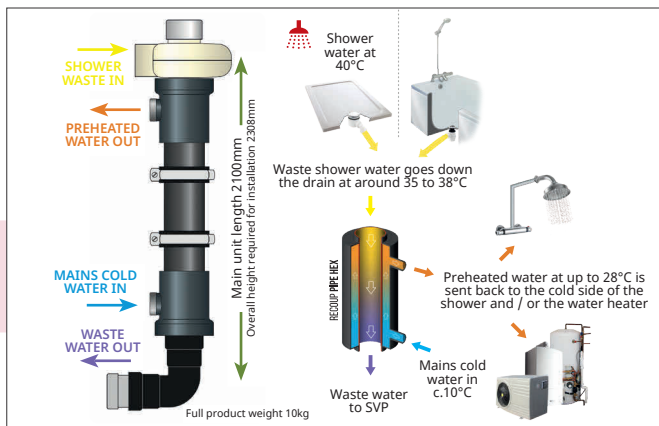
We are trialling a range of cutting-edge technologies which should enable our customers to live in a more sustainable way. Once built, the homes will be sold and lived in, allowing us to collate customer feedback and measure the performance of the new technologies, while ensuring they are easy and efficient to use in everyday living.



Battery storage

Enables electric energy from renewables to be stored and then released when power is needed within the home or when electricity is more expensive to buy.

Batteries work with solar PV panels, capturing and storing the electricity generated during the day when the sun is out so it can be used in the evening or whenever it is needed. This stored energy is fed back into the mains consumer unit as and when required, helping to reduce electricity bills.



Waste water heat recovery

Saves energy by recovering and using heat energy from waste water.

When you shower, you lose valuable heat energy as hot water goes down the drain. Waste water heat recovery technology works by transferring latent heat from the waste shower water through a heat exchanger (pipe) system to preheat the incoming mains water. This reduces the amount of energy required to heat the mains water, therefore lowering emissions and energy bills. This technology has no moving parts and requires no ongoing maintenance.



Infrared heating

Transfers heat to objects and people directly, rather than heating the air.

Infrared heating differs from traditional conduction and convection methods of heating which generally need another material in between to transfer heat to - such as the metal in radiators. This is more energy efficient as it heats the person directly rather than the entire room.

Infrared heating is low maintenance and can be installed on walls, ceilings or floors to provide an alternative space heating option.



Therma skirt®

An innovative heating system to replace radiators designed to look like a skirting board.

The hot water pipes run around the perimeter of the room, and a thermally-efficient outer panel extracts heat from the pipes and radiates it into the room, quickly warming the air. This low maintenance system is completely concealed, it does not limit the interior design and furniture can be configured as desired.



Heat pump cylinders

An integral heat pump extracts heat from the outside air, heating up the coils within a closed loop system, which in turn heats up the water in the cylinder.

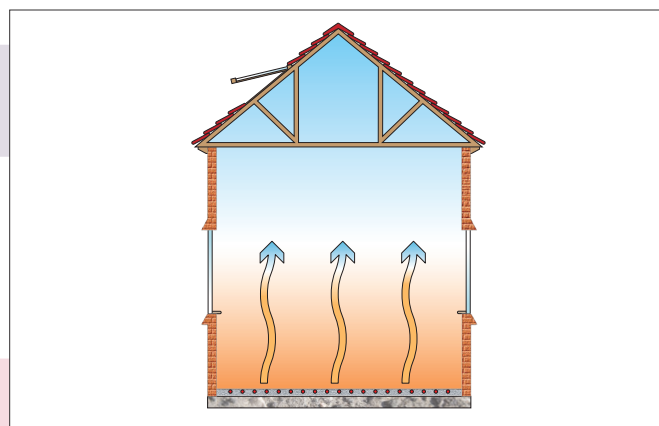
A heat pump cylinder can provide hot water very efficiently, working like a traditional air source heat pump by extracting heat from external fresh air via insulated ducting to provide hot water directly into the cylinder. They are relatively low maintenance and require an annual check.



Air source heat pump

Extracts heat from the outside air to provide heat and hot water.

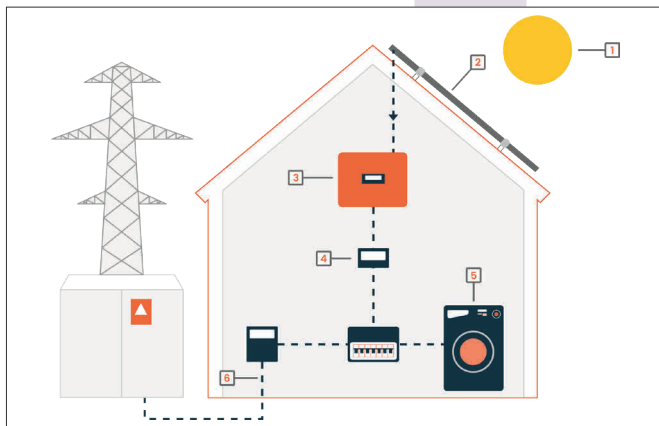
The air source heat pump draws in ambient air from outside, which causes a refrigerant liquid to boil and turn to gas. The heat pump then compresses that gas and uses the warmth it creates to heat the home and provide hot water. Placing the air source heat pump in the loft, rather than locating it elsewhere either in or outside the home, helps address any noise and vibration concerns, while also preventing the loss of valuable internal space within the home. At Sudbury, we are therefore trialling a roof mounted air source heat pump and are the first developer in the UK to do so on a live development.



Underfloor heating

Provides heat evenly and efficiently throughout a room.

Underfloor heating works by circulating warm water through a network of pipes beneath the floor screed. Compared to a traditional central heating system, the entire surface of the floor warms which means that water within the heating system does not need to reach as high a temperature due to the larger surface area being heated. As the underfloor heating is completely concealed and there are no radiators, there is more wall space and no limitations to how you can arrange your furniture.



PV panels

Convert sunlight into electricity for the home.

Solar photovoltaic (PV) systems are integrated into the roof to provide a renewable source of energy generation. Low maintenance and with no moving parts, the solar PV panels will generate a proportion of the home's electricity requirements, reducing its energy demand and reliance on the national energy grid.



Mechanical ventilation with heat recovery

Provides fresh filtered air into a building whilst retaining some of the energy that has already been used in heating the building.

A mechanical ventilation heat recovery system removes the warm air from your bathroom and kitchen and other wet rooms, through a series of ceiling vents and concealed pipes. This air then passes through a heat exchanger before it is expelled outside the home. The captured heat warms the fresh incoming filtered air from outside and distributed across the home through ceiling vents. The system also filters the air being helping to reduce dust and pollen within the home.



Exhaust air heat pump

Absorbs heat from the waste air (or 'exhaust' air) leaving a building which is then used to heat the home or water.

An exhaust air heat pump can combine ventilation, heating and hot water in a single unit. It is low maintenance and can be particularly effective in apartments and smaller plots.

In a similar way to a mechanical ventilation heat recovery system, it uses a system of ceiling vents and concealed pipes to extract warm air from your bathroom and kitchen. This warm air is then used to provide space heating and hot water in the same way that an air source heat pump system operates. The key difference is that the air comes from inside your home, rather than outside.

Index of Technologies

The table below contains a list of new technologies and fabric solutions in our five trial prototype homes.

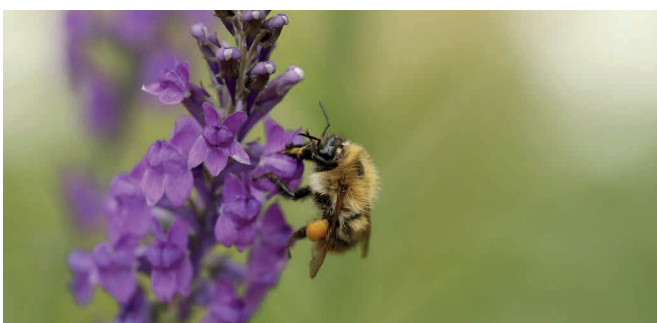
	The Trusdale 4 bedroom home 1,243 sq ft Plot 151	The Garrton 5 bedroom home 1,825 sq ft Plot 152	The Garrton 5 bedroom home 1,825 sq ft Plot 153	The Ashenford 2 bedroom home 771 sq ft Plot 154	The Easedale 3 bedroom home 931 sq ft Plot 155
Smart home energy system	✓				
Waste water heat recovery	✓	✓	✓	✓	✓
Air source heat pump		✓	✓		
Mechanical ventilation with heat recovery			✓		
Exhaust Air heat pump				✓	
Underfloor Heating			✓		
Thermal Skirting			✓		
Battery Storage	✓				
Heat pump cylinder					✓
Electric panel space heating					✓
PV panels	✓				✓
Infrared heating	✓				
Smart cylinder	✓				
Triple Glazing	✓	✓	✓	✓	✓
A-rated front door	✓	✓	✓	✓	✓
Timber Build with Enhanced Walls	✓				
Block Build with Enhanced Walls		✓	✓	✓	✓

Nature Friendly Homes

We're creating space for nature and wildlife on our developments, helping to protect the UK's native species. Research shows that being close to nature is good for our health and wellbeing, so our approach is benefiting customers too.

Building on the Government's biodiversity net gain commitment, we're designing our developments to ensure that they provide more habitat for wildlife than before we started work. All suitable sites include features such as:

- **Hedgehog highways** - holes cut into the bottom of fences to allow hedgehogs to travel freely through gardens
- **Bee bricks** - construction bricks with nesting holes for solitary bees, which can be built into homes or used as part of features around gardens and green spaces
- **Bat and bird boxes** - nesting boxes for various species of bats and birds that can be installed on homes and in trees
- **Bug hotels** - habitats made from a variety of natural materials, such as bamboo canes and dead wood, that provide a safe and cosy shelter for insects
- **Pollinator-friendly planting** - species of flowering plants that attract pollinating insects such as bees and butterflies
- **Pollinator pathways** - connected areas of green space planted with flowering plants that attract pollinators
- **Native tree and shrub planting** - the use of native species that are favoured by our wildlife
- **Retention of existing trees and hedgerow wherever possible** - established trees and hedgerows support and provide homes for a wide range of wildlife



We have partnered with national organisations such as Buglife and Hedgehog Street to develop our approach. We're encouraging and supporting customers to adopt nature-friendly gardening practices, which can significantly expand space for nature on completed developments. We're also using recycled materials to create borders and control weeds in areas that need to be kept tidier.

We have included a number of nature enhancements as part of our five-plot trial.

1 Bee Brick

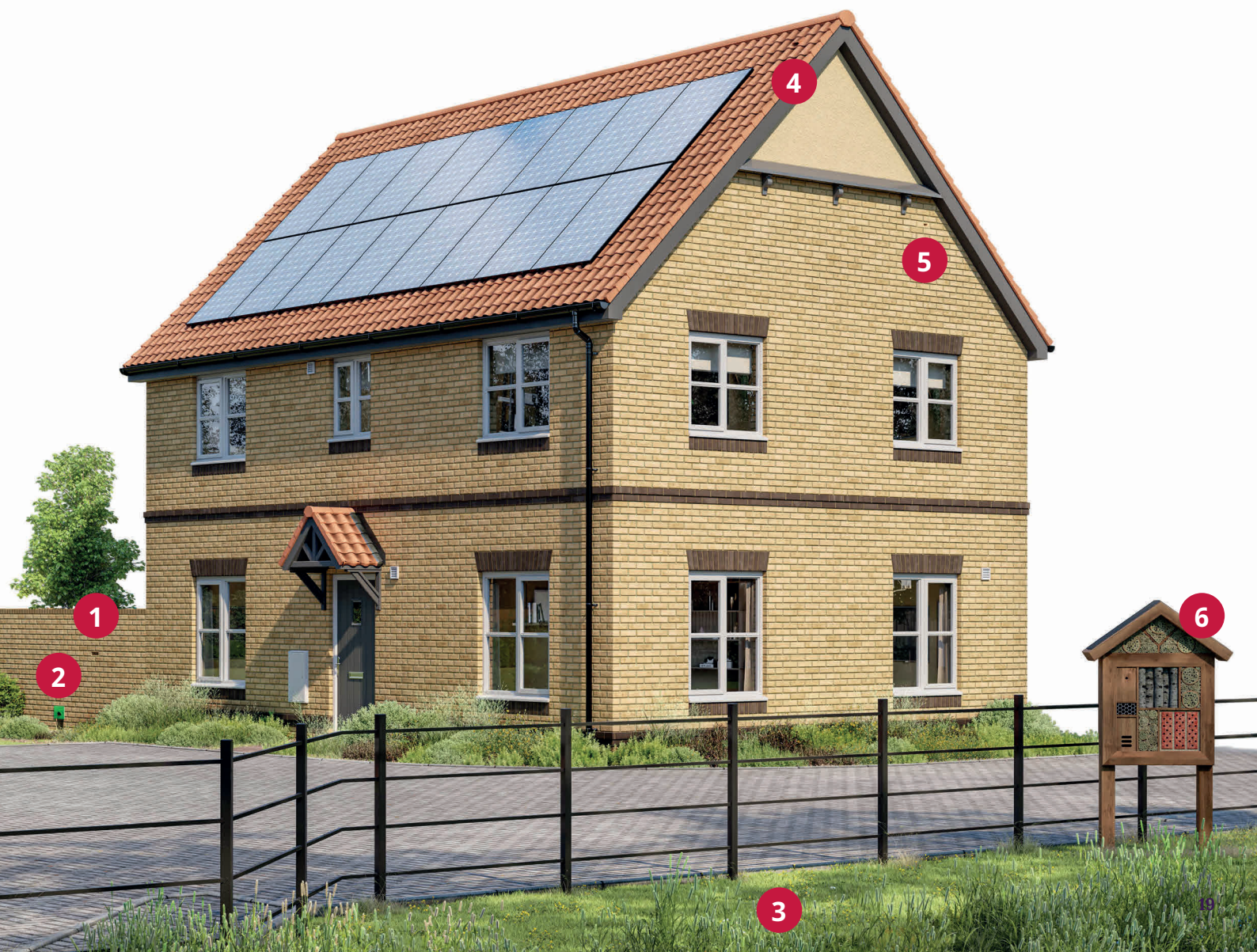
2 Hedgehog Highway

3 Wildflower Area

4 Bat Tile

5 Swift Brick

6 Bug Hotel



Our Partners



Taylor
Wimpey

www.taylorwimpey.co.uk