What developers need to know about the Future Homes and Buildings Standard

Strategies for a smooth and effective transition to heating and ventilation systems centred around heat pumps

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Introduction

Reinforcing the government's commitment to "improving the energy efficiency and reducing the carbon emissions of new homes and non-domestic buildings", the Future Homes and Buildings Standard is a proactive step towards creating more resilient, sustainable and liveable communities.

It also represents a significant opportunity for the construction industry to advance its contribution to a more environmentally friendly future, and UK developers have received the strongest indication yet that the Future Homes and Buildings Standard will go live in 2025, as planned.

The latest government consultation process ran from the 13th December 2023 to 27th March 2024, setting out technical proposals for changes to the Building Regulations, primarily covering the conservation of fuel and power, as well as ventilation for new homes and non-domestic buildings.

This signals a gear change for developers. With around a year until sweeping changes come in, there are significant updates to get to grips with in a relatively short time. While developers are set to primarily focus on ensuring they're fully prepared and compliant, it's also an important time to recognise and capitalise on the powerful opportunity the changes represent.

Although the legislative direction of travel has been clear for some time, the Future Homes and Building Standard confirms the government's focus on heat pumps to improve the energy efficiency of new housing stock. Bringing significant change to how new developments are designed, built and heated, the shift to heat pumps moves UK homes closer to a net zero 2050 goal, by providing a sustainable, renewable, low CO2 heating source.

The topline impact of the government's confirmation is that every house style in a developer's portfolio will have to be redesigned to incorporate a 'net zero ready' heat source, in most cases a heat pump. Although set to be a detailed and extensive process for developers, the shift will pave the way for widescale adoption and greater public recognition of the myriad benefits heat pumps offer. It makes sense for developers to begin this uplift as soon as possible, not only to ensure compliance, but also to drive sustainable change within the industry and the homes it builds.

During this decision-making and redesign process, it will also be important to consider the longer-term implications of any chosen heating and ventilation package. As the shift towards heat pumps becomes embedded, homebuyers and homeowners will quickly learn about how heat pumps and related technologies can reduce their energy use and enhance the comfort of their homes.

This shift in public perception and knowledge will drive further momentum in the market, lifting standards and expectations ever-higher – and this is a great opportunity for forward-thinking developers to enhance their reputations in the short and long term by embracing the solutions that offer the greatest potential in terms of buyer motivation and satisfaction.

To help developers implement the Future Homes and Buildings Standard in a future-proofed way that goes beyond just compliance, we've analysed the key implications of the legislation and identified key takeaways to make the process as smooth as possible.

"Quality has improved, and new builds are...generally much more energy efficient than older homes as they must adhere to more stringent regulations such as the Future Homes Standard."

David Parry,
Policy and Public Affairs Officer, CIOB

The path to the Future Homes and Buildings Standard

The Future Homes and Buildings Standard is the culmination of a gradual change in the building regulations environment, and should be understood in the context of the following previous developments:

Key changes to Building Regulations Part L (2021, amended in 2023)

- All new buildings need to generate 31% fewer CO_2 emissions than previous regulations allowed.
- Any space heating supplied by a heat pump must deliver a minimum Coefficient of Performance (CoP) of 3.0, which means for every 1kW of electricity used, the heat pump's output must be 3kW of heat.
- New build houses with air source heat pumps should be designed to a maximum 45°C flow temperature.
- U-values for the thermal transmittance of windows and openings have been upgraded and all new dwellings should achieve airtightness of 1.6 W/(M^2K)/hr as a minimum.

Headline implication for developers

With a 45°C flow temperature, radiators will need to double in size and significantly increase in price to achieve the same outputs as the typical method of calculating radiators, which uses a flow temperature of 70°C. This makes underfloor heating a more attractive option offering greater energy efficiency, heat distribution and easier space planning.

Key changes to Building Regulations Part F (2022)

- Greater focus on air tightness combined with the right ventilation means only three ventilation systems are now recognised: background ventilators and intermittent extractor fans, continuous mechanical extract ventilation (MEV), and continuous mechanical ventilation with heat recovery (MVHR).
- Increase in minimum whole dwelling ventilation rate from 21 to 31 l/s in three-bedroom houses.

Headline implication for developers

With increasing airtightness requirements from Part L, ventilation needs to be more effective and tied into the overall heating decision-making process.

Key changes to Building Regulations Part O (2022)

- Excess heat should be removed from residential buildings by any of the following: opening windows, ventilation louvres in external walls, a mechanical ventilation system, or a mechanical cooling system.
- Ventilation using windows must take into account noise, pollution and security.

Headline implication for developers

It's unlikely that windows alone can be relied upon to remove excess heat from a building in some climates, centring attention on mechanical systems. Reflecting this, there are geographical variations to this specification.

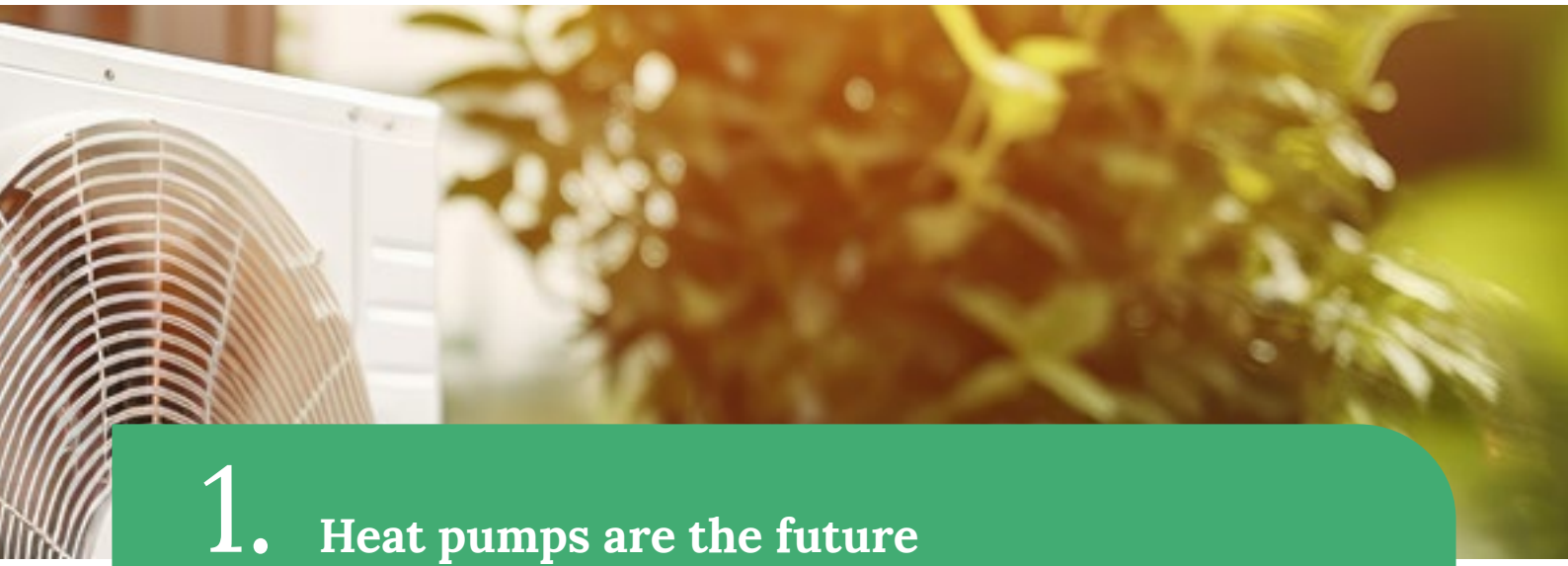
These regulatory shifts specified more sustainable practices but didn't definitively call out heat pumps as the recommended heat source.

The Future Homes and Buildings Standard changes this.

The new legislation decoded: what developers need to know

For leading developers, it's clear that the new legislation must be interpreted on both a technical level and in a wider whole-business context. They recognise that the market shift resulting from the Future Homes and Buildings Standard represents a significant business opportunity to boost sustainability credentials and create more comfortable, energy efficient homes for future generations.

To achieve this, it's vital to decode the legislation to identify crucial areas for action in terms of compliance, streamlining change for maximum efficiency, and looking ahead to wider implications. Following this approach, there are three essential messages in the Future Homes and Buildings Standard:



1. Heat pumps are the future

The consultation states:

"All performance requirements are based on notional buildings with an efficient air source heat pump or a 4th generation heat network that uses heat pumps. We found no practical way to allow the installation of fossil fuel boilers while also delivering significant carbon savings and 'zero-carbon ready' homes. As such, we do not expect fossil fuel heating, such as gas, hybrid heat pumps and hydrogen-ready boilers, will meet these standards.

We considered other types of widely commercially available electric heating, such as direct electric and immersion heaters. While these achieve the goal of being 'zero-carbon ready' they can bemore expensive to run than modern heat pumps, pushing up bills for households."

This legislation models heat pumps as the likely main successor to gas boilers because they reduce a home's carbon footprint by using cleaner electricity and are currently the most cost-effective form of heating using electricity. They offer an average Coefficient of Performance (COP) of 2.5 or more, in comparison to an electric fire or gas boiler that has an average COP of one.

"Assessing the legislation as a whole, it's moving guidance away from direct electric heating. It doesn't forbid that, but it's blocking off many of the places you could go to except for heat pumps."

Martyn Neil,
Wavin UK Commercial Director of Indoor Climate Solutions

2. Heat networks are the preferred option for apartments

The consultation states:

"New low-carbon communal and district heat networks will likely be the preferred way of providing heating and hot water to blocks of flats under the Future Homes Standard. All performance requirements are based on notional buildings with an efficient air source heat pump or a 4th generation heat network that uses air source heat pumps."

This sensible guidance recognises how impractical it would be to attempt to fit an individual air source heat pump for every flat in a block in terms of noise, space and expense. It also highlights how the communal 'diversity factor' of a shared 4th generation heat network will reduce the amount of energy each flat uses compared to that required by individual heat pumps. It envisions Heat Interface Units (HIUs) will maximise performance while providing hot water using the lowest heat network temperature possible. It's also important to note that CIBSE CP1 Code of Practice for Heat Networks will be used as the standard for the heat networks flats will use.

"Fourth-generation heat networks rely on low return temperatures for efficient operation. System performance relies on the performance of the HIU, and the data provided by it, making electronic HIUs a better choice for developers. Underfloor heating and MVHR are the perfect partners to achieve low return temperatures and optimise efficiency."

Martyn Neil,
Wavin UK Commercial Director of Indoor Climate Solutions

3. Ventilation standards will focus on installation and commissioning

The consultation states:

"The performance of fixed building services, particularly mechanical ventilation systems, is highly dependent on the quality of the design and installation, and so these systems must be installed and commissioned by people with the right knowledge and skills. Where installation and commissioning are carried out by a member of a competent person scheme, they can self-certify that the work was done to a sufficient standard. When the installer is not part of a competent person scheme, building control must check and approve all installations."

The Future Homes and Buildings Standard recognises that the efficient running of heating and ventilation systems depends upon correct installation, followed by careful adjustments during commissioning.

Today, installing ventilation often sits between trades - sometimes installed by plumbers or electricians instead of specialists. However, the new requirements for a 'registered competent person' will make this an individual specialisation, and the final Standard will include enforcement mechanisms for where work falls short of the required standard.

"Given the potential negative and long-term impacts of poor installation, strong specification, design and commissioning is key to the success of the ventilation system. Certified training for installers will become the minimum requirement for anyone putting a ventilation system into a new build."

Marc Salvatore,
Wavin UK Business Development Manager-Ventilation for Indoor Climate Solutions

What are the surprises in the consultation?

When interpreting regulations for the longer term, what isn't covered can often be as informative as what is. This is particularly the case when regulations have such a clear central purpose which, in the Future Homes and Buildings Standard, is to direct developers to use heat pumps.

1. There's no further extension of 'fabric first'

The Standard briefly mentions the fact the government sees no need to provide any further guidance on this core principle that drives sustainability into new construction projects.

Developers could interpret this as permission to stop progressing the sustainability of the fabric they provide. However, it would be wise not to fall behind industry developments in this area. Astute developers will be keeping a close eye on how the industry is progressing to stay current and ready to switch up their plans should guidance change suddenly.

"The energy crisis has driven people to be more conscious about running costs and building costs. As a result, we're beginning to see the development of a green premium where developers can differentiate from each other by providing low carbon, sustainable homes that customers want to live in."

Richard Lankshear
Programme Director, Future Homes Hub

2. There's no specification that ventilation systems must reclaim heat

The Standard allows the options of intermittent fans and decentralised Mechanical Extract Ventilation (dMEV), but these solutions don't recover the heat from extracted air. Low-temperature heat from a heat pump relies on a stable indoor environment with limited 'leakage' from draughts. Using intermittent extract fans or dMEV risks removes heat as air is extracted, creating an unstable indoor temperature.

In contrast, MVHR can recover between 85-90% of the heat leaving the home (reducing the home's heating requirements by up to 25%) and it's able to use this to augment the low-temperature heat from the heat pump. The combination of MVHR and a heat pump is the best pairing in terms of boosting energy efficiency and keeping running costs as low as possible.

"There's a lost opportunity here to make sure home buyers get the most efficient heating and ventilation solution. It's worth considering if an MVHR system recovering the heat will deliver better value for buyers as well as lower energy bills. It's an opportunity to reinforce a developer's reputation as a better-quality brand than their competitors."

Marc Salvatore,
Wavin UK Business Development Manager-Ventilation for Indoor Climate Solutions

3. The benefits of underfloor heating as the best partner for heat pumps aren't stated explicitly in the Standard

The size of the heat-emitting surface (radiators or underfloor heating) is just as crucial to boosting the performance of a heat pump system as MVHR is. The compressor in a heat pump works most efficiently (and uses the lowest levels of electricity) when there's only a small temperature difference between the heat pump and the water temperature that the radiators or underfloor heating need.

To be effective with the low water temperatures of a heat pump, radiators will need to have a much larger surface area. This is unlikely to be practical because of the wall space it would take up, and is unpopular with buyers who want unobtrusive heat.

Underfloor heating is much more effective when combined with a heat pump because it offers the greatest heat emitting surface, so can run at very low temperatures. For example, it can be run as low as 30 degrees to achieve a room temperature of 20 degrees.

Underfloor heating's ability to work with this reduced air temperature can generate savings of around 10%. However, combined with a heat pump, there's a probable additional 25% gain in the efficiency of the heat pump, resulting in potential total cost savings of over 30%. In monetary terms, the combined savings from reduced air temperature and improved appliance efficiency when using a heat pump can be between £1,326-£1,643 in 2023 prices.

"The changes [in the Future Homes and Buildings Standard] might seem technical, but they represent essential steps towards a more sustainable future for our homes and our planet."

Centre for Sustainable Energy

How can developers get the most from the Standard?

The main thrust of the Standard is to drive down carbon emissions from dwellings by heavily advocating heat pumps. For developers, the short term now needs to be finding a new approach that both follows the Standard and makes the most business sense.

While the bottom line is crucial, driven by the philosophy of keeping costs down and sale prices up, a longer-term view will arguably step developers up to a better position for the future. There's clear potential here for developers to create market standout by delivering heating and ventilation combinations that satisfy homeowners' desire for comfortable, energy efficient and environmentally friendly homes. Rather than taking a low-cost option that risks complaints and reputational damage, astute developers can get ahead of market trends and set the bar for homebuyer expectations.

Create a positive buyer investment

It's likely that, once the Standard is live and heat pumps are a new-home reality, potential buyers will quickly learn about the best combinations of systems for heating and cooling their homes. As a result, it'll be a make-or-break time for developers' reputations as word gets around about what each developer is including in their designs.

The positive news is that our 2023 research into buyer views on indoor climate solutions revealed significant enthusiasm in the new home buyer population for high-quality solutions, with buyers viewing these systems as a smart investment and willing to pay a price premium for them. Coupled with the right communication strategy, these solutions will help create competitive advantage, boost the developer's reputation for creating comfortable, quality homes, and get buyers to embrace the extra costs of an effective heating and ventilation system.

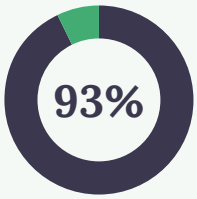
"Complaints from house buyers are the last thing anyone wants when the Future Homes Standard is introduced. The risks are that buyers experience higher-than-expected bills or poor system performance. However, a well specified, installed and commissioned indoor climate system will increase new build values and developer reputation, while also reducing homeowners' bills."

Martyn Neil,
Wavin UK Commercial Director of Indoor Climate Solutions

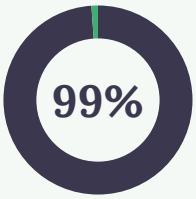
Buyers are prepared to invest in effective heating and ventilation 'packages'

Developers redesigning the heating and ventilation aspects of their housing portfolios need to understand what's important to buyers, and what will motivate them to agree to a higher price point.

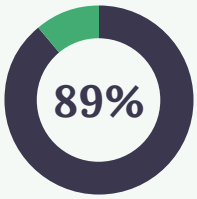
Get inside the prospective buyer's mind



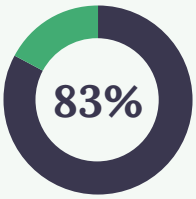
are concerned about energy costs.



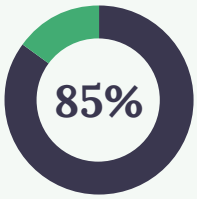
rate energy performance as important when buying a new home.



would consider mechanical ventilation if it were likely to be more energy efficient



rated maximising space as extremely or very important when choosing underfloor heating over larger radiators.



would be prepared to pay more for a home that is more energy efficient than the current regulatory requirements.

The 2021-2 energy price shock gave all UK citizens a crash course in the direct relationship between energy efficiency and their bills. This means prospective new-build buyers are open to clear explanations about how upfront investment in the most energy-efficient heating and ventilation system will pay for itself in the longer term through lower energy bills.

Potentially, the most effective messaging is to communicate the benefits of a package made up of a heat pump, underfloor heating and MVHR – particularly since the calculations about likely energy savings are so interdependent. So, how can developers go about establishing these figures reliably?

What should developers be doing now to seize the advantage?

Rather than waiting for the final shape of the Future Homes and Buildings Standard, developers can get ahead right now in two key ways:

Get ready for the Home Energy Model

Following recommendations by the Climate Change Committee (CCC) and a scoping study commissioned by the former Department for Business, Energy and Industrial Strategy, the government is currently developing a new methodology to increase the accuracy, robustness and net-zero fitness of the Standard Assessment Procedure (SAP) for the energy rating of dwellings.

The new Home Energy Model will be implemented alongside the Future Homes Standard in 2025. Its overall aim is to produce and provide more accurate estimations of the energy performance of new homes, narrowing the gap between predictions and actual operations.

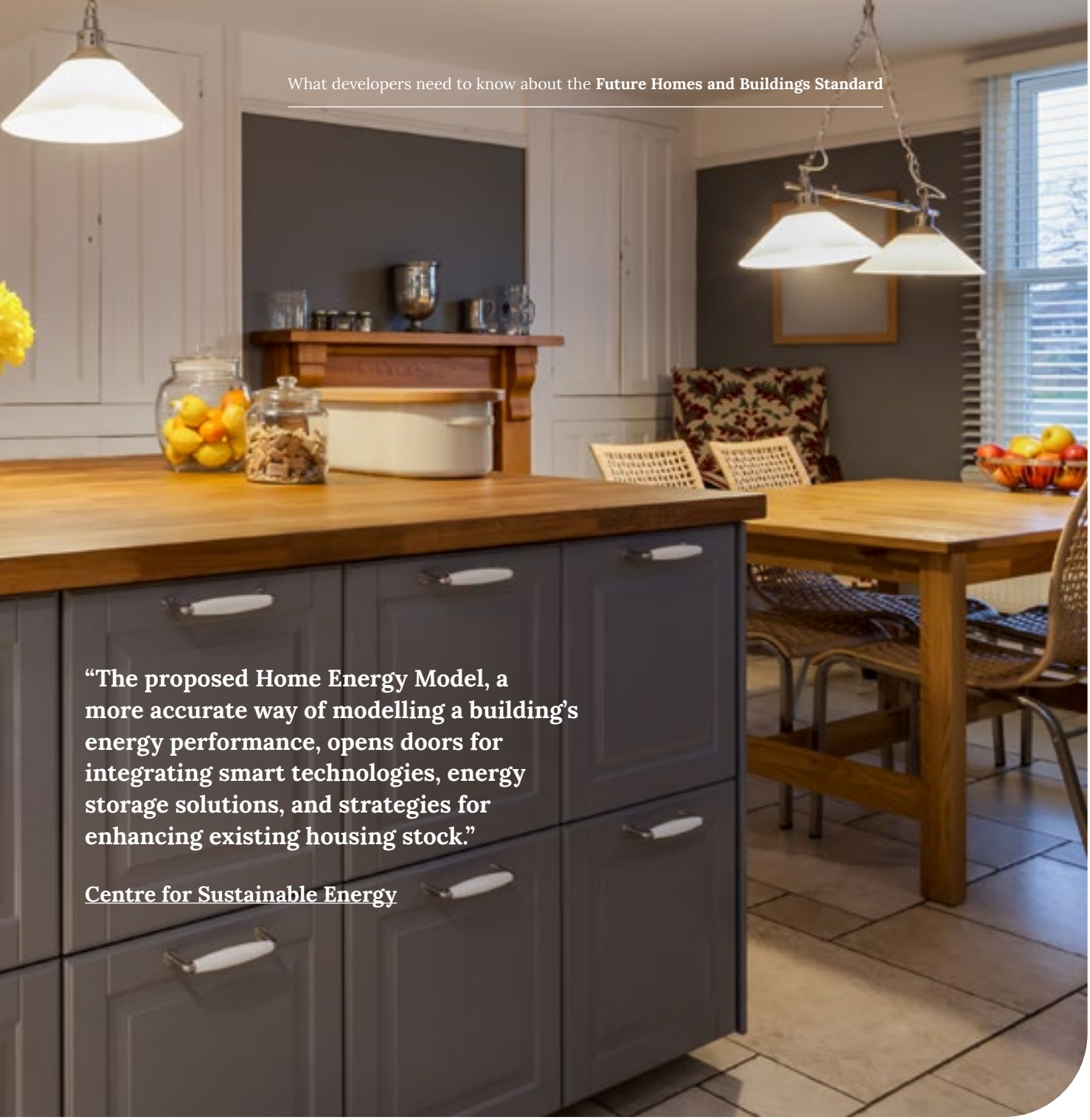
However, the biggest benefit for developers is the added flexibility it brings to designing homes with optimum energy efficiency. The Home Energy Model opens the door for manufacturers to prove the performance of their products and solutions on an individual basis, and then bring the results to developers. Potentially, this will make the selection process much shorter and easier for developers since they'll have proven results to compare against agreed metrics.

It will also allow a more holistic view of heating and ventilation combinations, looking at where, for example, MVHR is contributing to the overall heat 'package' of the home.

Plus, when new technologies come along, the innovating company can share the burden of assessing the likely energy effectiveness of the innovation. In the longer term, this will encourage the indoor climate solutions market to innovate and grow.

"Rather than SAPs being confined to a small group of assessors, manufacturers will be able to conduct an open assessment to prove the differentiation of their technology, and then work proactively with developers to demonstrate the benefit to house builders' designs."

Tony Croke
Wavin UK Product Manager for Indoor Climate Solutions



"The proposed Home Energy Model, a more accurate way of modelling a building's energy performance, opens doors for integrating smart technologies, energy storage solutions, and strategies for enhancing existing housing stock."

Centre for Sustainable Energy

Make the most of pilot projects

At some point, developers will have to redesign their product portfolio to reflect the requirements of the Future Homes and Buildings Standard – in particular with the inclusion of a heat pump.

Leading developers are increasingly using pilot projects to test out the options for their house models before they roll out changes across all future sites. This is an opportunity to engage with heating and ventilation solution suppliers, bringing their expertise to bear on the search for the most energy - and cost-efficient approach. It's also a chance to get to grips with the practicalities of installation to iron out any difficulties that could cause delays or extra expense on a larger scale.

Wavin Indoor Climate Solutions

At Wavin, we're committed to delivering indoor climate solutions that work together for easy compliance with the Future Homes and Buildings Standard.

Working with us gives developers the following topline benefits:

- Single source supply for underfloor heating, ventilation, heat interface units and single smart controls
- Bespoke solutions for optimal energy efficiency and indoor air quality
- Building regulations compliance
- Technical project support.

Explore Wavin Comfia underfloor heating

At Wavin, we supply components including manifolds, panels, pipes and fittings for the most popular types of underfloor heating currently being installed in the UK, such as screeded, joisted and overlay systems.

Our Comfia underfloor heating provides the following benefits:

- Quality assurance and compliance with building regulations (Part L)
- Simplified design and planning with our easy-to-use underfloor heating calculator
- Easy installation
- Availability from a broad range of merchants across the UK.

For easy heating management that supports efficient energy usage, we can also supply a specialist heating control system. The Wavin Sentio system is designed for simplicity, and installers can easily 'connect, set and go' with logical installation, effortless configuration and smart app-controlled usability. The accompanying app makes it simple for users to control their heating remotely.

Discover more about Comfia Underfloor Heating at:
Wavin UK | Comfia Underfloor Heating

Discover more about Wavin's Sentio Controls at:
Wavin UK | Sentio Controls

Explore Wavin Ventiza ventilation

Design and install with confidence using Ventiza ventilation units for MVHR with the following benefits:

- Independently tested by BRE and conforms to building regulation requirements
- Ventilation unit can be matched to property size for maximum efficiency
- Can be integrated with premium heat exchangers with extremely low power consumption for optimal energy efficiency
- Low profile ceiling-mounted units available
- Semi-rigid ducting solutions to create a system approach to ventilation.

Discover more about the Ventiza range at:
Wavin UK | Ventiza MVHR

Discover the full range of Indoor Climate Solutions at:
Wavin UK | Indoor Climate Solutions

Explore Calefa Heat Interface Units

A bespoke solutions for optimal energy efficiency and indoor air quality:

- Developed in Denmark, the home of District Heating Units and project proven in Europe, Calefa sets new standards for domestic hot water delivery in terms of its responsiveness, efficiency and ease of installation.
- BESA and KIWA tested
- A unique bypass control makes Calefa the most efficient unit on the market
- Supplied, commissioned and maintained by Wavin

Discover more about Wavin's Calefa range at:
Wavin UK | Calefa Heat Interface Units

Conclusion

To ensure a smooth transition to the Future Homes and Buildings Standard, and to use it as a platform to create ‘net zero ready’ homes that are a hit with buyers, developers must act now.

The starting point should be taking a holistic view of heating and ventilation to reimagine climate control in post-2025 new build homes.

The Future Homes and Buildings Standard is powerful opportunity for the construction industry to contribute to a more sustainable future, and the developers who act now will establish an early advantage in the marketplace - leading the way on the efficient and effective indoor climate solutions homebuyers will soon expect.

How Wavin can help

Discover more about our Indoor Climate Solutions and how these can help developers create the strongest new-home blueprints to take to the market: Wavin UK | Indoor Climate Solutions

Wavin is part of Orbia, a community of companies working together to tackle some of the world's most complex challenges. We are bound by a common purpose: To Advance Life Around the World.

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