

THE FUTURE HOMES DELIVERY PLAN

The sector-wide climate and environment plan for high quality homes and places

Report of Future Homes Task Force

Overview

In September 2020, the Future Homes Task Force came together to develop a sector-wide climate and environment delivery plan for England.

This plan, the culmination of that unprecedented collaboration, sets out the goals, the roadmap and the requirements for a new delivery hub to support the development of high-quality sustainable homes across the whole sector.

The new Future Homes Delivery Hub will bring together all sectors involved in developing new homes such as home builders, suppliers, skills bodies, planners, energy infrastructure, energy and water companies, the finance sector, warranty bodies, central government and agencies and local government to help achieve the transformation collaboratively.

The goals, commitment and roadmap have been developed with the Government to ensure they are in line with, and can evolve with, the Government's climate and environmental commitments.

This report sets out how the proposals were developed and is divided into three sections:

1. The context to homes and the environment
2. The goals, commitments and roadmap
3. Implementation and the delivery hub

This report is accompanied by a shorter document which simply sets out the goals, commitments and roadmap which all relevant stakeholders will collaborate to achieve through the delivery hub.

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Foreword



One of the defining challenges of our time is, simultaneously, to tackle the shortage of high-quality homes; avoid adding to climate change; improve biodiversity and our wider natural environment; create homes that are high quality, comfortable, safe and ready for inevitable changes in our climate; and create beautiful neighbourhoods where people want to live and work.

The fundamental importance of our homes and immediate environments to our collective wellbeing has never been clearer than over the last year, during the national lockdowns.

Earlier this year, the Government took a substantial step in this journey – setting the Future Homes Standard at a level which means that new homes will move away from fossil fuel heating and be future proofed with high levels of energy efficiency. But this is a multi-faceted set of challenges. Decarbonising new homes also means decarbonising the process of production and construction, designing developments to support low carbon lifestyles and driving carbon from business operations.

At the same time Net Biodiversity Gain means weaving nature more effectively in and around developments not only to improve quality of life but also to reverse wider biodiversity loss. We need to build homes that are well ventilated with fresh air, avoid overheating, are protected from flood risk and are more efficient in their use of water and resources.

Throughout we need to make sure we are building better

homes and are more attractive and nature-rich places to live, inspiring customers to demand homes that meet the new standards. In combination this means a wholesale change in how we design and build homes for future generations. This is no small task.

It is at once exciting and an opportunity to unleash the spirit embodied in the Prime Minister's Ten Point Plan for a Green Industrial Revolution, spurring on new innovations and domestic supply chains. But we must also concentrate minds on the seriousness of the task. We must ensure our solutions are up to the size of the challenge and we must manage the risks associated with innovating quickly at scale across the country. We must also ensure the solutions work for all sizes and types of company, house type and all parts of the country in line with the Just Transition.

We will require new skills across the trades. We will need to bring together many of our greatest innovations and a new level of collaboration across the industry, to ensure supply chains respond at the right scale and we innovate together on the infrastructure needed. We will need to draw on everyone's expertise.

We have therefore been delighted to work together as leaders across the fields that contribute to and influence home building through the Future Homes Task Force to develop this plan which we believe responds to the scale of the challenge. This is in many ways the first sector-wide plan that not only covers sustainability as a whole, but also comes with a clear set of delivery proposals.

The Future Homes Delivery Hub will be the focal point for supporting the industry's implementation of the Future Homes plan and roadmap, including but going beyond the Future Homes Standard. It will be a safe space for the sector to come together, pool technical capacity and innovations, and find solutions with co-dependent sectors. The Hub will be industry led and supported by government to ensure successful sector-wide implementation.

The Hub will work with and connect the many great existing initiatives rather than replace or duplicate them. It must, as a priority, support smaller businesses including those in the self and custom build sector. The Hub must also work seamlessly with the Office for Place to make sure that sustainability and beauty go hand in hand. The Hub will have robust governance and accountability arrangements.

We would like to thank the very wide circle of stakeholders who have generously given their time to help get us to the starting line.

Now collectively we must ensure that we deliver, holding each others' feet to the fire, to make this positive vision for our country a reality. We judge previous generations by how well they build and so we will be judged by how we build.

This is our opportunity to get it right.

The Future Homes Task Force
27 July 2021



Members of the Task Force



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With senior attendance from
HM Government

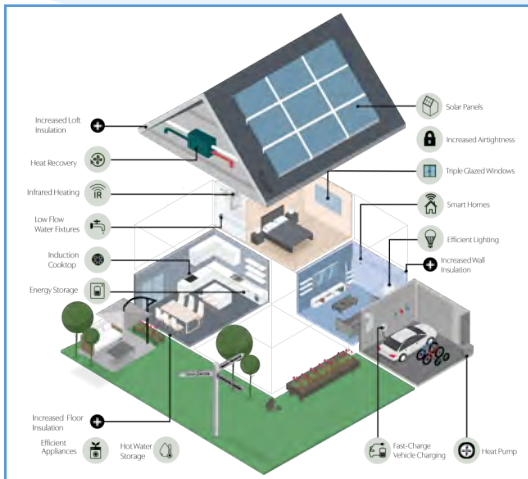


Executive summary

Summary of the goals

1

High-quality homes that are zero carbon ready and sustainable. Target levels to be set for 2025
(See page 8).



2

Places and developments that are consistently low carbon, nature-rich, resilient, healthy, well designed and beautiful by 2025.



3

Production and construction methods that are net zero and sustainable by 2050 with substantial progress by 2025 and 2030.



4

Businesses operations in line with the Race to Zero: net zero by 2050 with a 50% reduction by 2030.



Summary timelines of sector-wide goals and commitments

	HEADLINE GOAL	FROM 2025	FROM 2030	FROM 2040
Homes that are:	Zero carbon ready	Zero carbon ready (for regulated energy) across all homes, with very high fabric efficiency standards. (kWh/m2/yr; precise levels to be determined). Investigation of how further to reduce energy demand and emissions sector-wide.		
	Healthy, safe and comfortable	Target levels to be set for 2025 for interlinked elements such as: overheating, air quality, sound, space and accessibility, safety and daylighting.		
	Water efficient	Work with government to develop a roadmap in 2022 to achieve greater water efficiency in new development, including exploring the role for a fittings approach, for new technologies and innovative water systems and the potential for future targets for reducing water use in 2025 and 2030.		
	Designed for sustainable living	Incorporate technologies that enable sustainable lifestyles, including zero emission vehicle readiness.		
Places that:	Are well designed	All relevant applications will consistently design low carbon, nature, sustainable lifestyles, resilience, health and beauty into developments, in line with the National Model Design Code as early as possible. This will include greater connectivity with low carbon modes of transport.		
	Maximise Biodiversity Net Gain	Optimise benefits for nature and people from Biodiversity Net Gain once introduced. If appropriate, once properly analysed and understood, pilot the move to Environmental Net Gain and, work with the Government to develop the methodologies.		
	Achieve water resilience	All relevant applications give early and strategic consideration of how to proactively manage long term flood risk and water resilience, availability and quality at site and property level including the use of multi-benefit SuDS.		
	Respect environmental thresholds	Collaborative action to reduce pressure across the system, notably in areas vulnerable to nutrient overloads, water stress and floods.		
Production and construction that achieves:	Zero embodied carbon	Ambition to meet or exceed the World GBC Net Zero pathway, with rapid analysis to set robust and stretching targets for 2025, 2030 and 2040 and/or other dates as appropriate.		
	Resource efficiency	Incremental improvements and target to be set for 2025, 2030 and 2040.	Zero avoidable waste at all stages of the construction lifecycle by 2050.	
	Water efficiency	Early work to set reduction targets for, 2025, 2030 and 2040.		
		Up to 30% reduction.	Up to 40% reduction.	Up to 50% reduction.
	Low emissions to air	Air quality target to be set for 2025, 2030 and 2040.		
Businesses operations that are:	Net zero and sustainable	Establish and implement wider sustainability goals.	50% reduction in business emissions by 2030.	Net zero business emissions by 2050.

IMPROVED QUALITY AND CUSTOMER EXPERIENCE

IMPROVED QUALITY AND CUSTOMER EXPERIENCE

SECTION 1: context to homes and the environment

The climate and environmental policy framework.

The science tells us we need to act urgently to confront climate change and wider environmental pressures. UK governments have responded by putting in place a new policy framework to ensure these challenges are addressed.

In England this includes the legally binding targets of net zero greenhouse gas emissions through the **Climate Change Act** and wider targets covering nature, resources, water and air quality, through the new **Environment Bill**.

The new **National Design Guide** and **National Model Design Code** provide a framework for local authorities to design climate and environmental issues into development more consistently at planning stage.

The cycle of **Climate Change Risk Assessments** and **National Adaptation Programmes** under the Climate Change Act means policy will increasingly require policy to anticipate climate change impacts such as overheating, flooding and water stress.

The challenge for home building.

Taken together, this national framework of targets and goals constitute possibly the biggest set of challenges the homebuilding sector has ever faced. We know that these targets are with us for the long term, reinforced through growing public demand and for example, the environmental social and corporate governance (ESG) criteria set through the investment community.

Already we are beginning to see the process of translating national targets into policies specific to homebuilding with the Future Homes Standard and Biodiversity Net Gain. Inevitably this process of policy translation will continue for example, to address carbon emissions over a building's entire lifecycle (including the embodied carbon associated with construction and materials) and to meet water and resource efficiency targets.

Collectively, they require fundamentally, rethinking the way we design and build homes.

Understanding the home building context.

Managing this process of sector-wide transformation to meet the environmental challenges, while building enough and better homes, requires understanding the operational, commercial, market and environmental context for home building.

In particular the:

- social and government objective to build more homes
- need to bring the customer with us
- industry structure and context for smaller developers
- nature of the market
- land market and project cycles
- ecosystem of sectors and professions that influence new homes – and therefore need to be brought into the process of change
- interlinkages, co-dependencies and co-benefits between environmental issues and other operational issues
- need to manage innovation and delivery at scale safely and smoothly.

The need for a pro-active and structured framework for collaboration.

The Task Force therefore advocates a strategic delivery plan that is:

- well-structured and sequenced
- sector-wide
- facilitating collaboration between the co-dependent sectors involved in building homes
- durable
- putting experience and value for the customer at the heart of change.



SECTION 2: goals, commitments and roadmap

Organising the challenge into business domains where change is needed.

The sector-wide plan has therefore been developed to translate the national policy framework into a structured and sequenced delivery plan.

The plan is organised into four domains, reflecting the business activities that shape the environment's:

- performance of homes in operation
- planning and site design
- production and construction process
- wider business

Sequencing goals and commitments to plan for transformational change.

The Task Force recognises that it is not possible to do everything at once and that the roadmap therefore needs to be carefully sequenced. *The table on page 8* shows the goals structured into time periods from 2025, 2030 and 2040 to facilitate collaborative planning for sector-wide transformation. The set of

relevant environmental issues is considered together within each domain to enable joined-up thinking, for example about how homes can be designed to be zero carbon, water efficient, comfortable and safe at the same time.

While some of the goals have firm metrics and targets, others do not yet without further analysis. **A year one activity for the delivery hub is therefore to complete the set of industry-wide metrics.**

Roadmaps as 'staircase' to support sector-wide change.

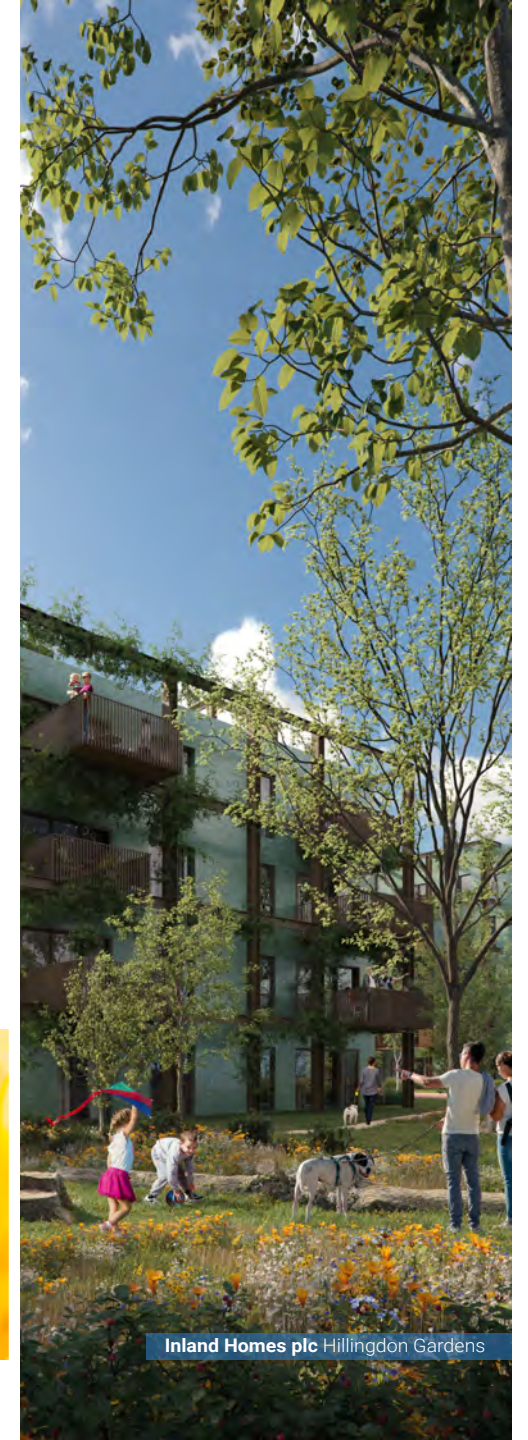
For each domain the Task Force believes it is necessary there is a roadmap which sets out the current view of the 'staircase' of enabling steps that need to be taken across the sector to support the change. This includes the collaborative activities that will be undertaken through the delivery hub and the Government actions that will facilitate change.

This approach is particularly important for smaller developers to ensure sufficient timescales and the ability to develop the necessary skills and share learnings across the industry.

Support from government and a social compact.

The Task Force and stakeholder discussions consistently echoed the view that we can only create sufficient confidence to plan and collaborate over the timescales needed with the right degree of collaboration with government and more widely a form of 'social compact' between stakeholders involved in the process of delivery. Key players, including through representative bodies, need to commit to working together to achieve the goals.

The Task Force also believes support from government is vital to give widespread confidence that the plan is in line with government's objectives and to unblock progress where necessary.



Inland Homes plc Hillingdon Gardens

SECTION 3: implementation and delivery hub

Section 3 sets out the emerging arrangements through the delivery hub to ensure the plan is genuinely sector-wide, brings together the 'delivery chain' of partners required to enable delivery, gives everyone confidence in delivery and is managed under a robust governance framework.

Emerging role and structure of the delivery hub.

Every developer will need to go through a similar change programme to meet not just the Future Homes Standard and wider aspects of net zero, but the wider set of goals in this plan. Rather than this change being managed separately by each 2,500 home builders, the purpose of the delivery hub is to facilitate collaboration and innovation across the sector, with the supply chain and with the range of expert bodies required to achieve the goals.

The Hub will own the enabling steps in the roadmap and to oversee and unblock progress. The Hub will be a small central team that brings together the right people, defines the right questions, delivers the right answers and does this at the right

time. Strong buy in of both the development industry and wider delivery chain is essential.

Independence governance of the implementation at the delivery hub.

At the same time, to retain trust and credibility, especially as circumstances evolve and change over the next years, the Task Force is of the view that the roadmap and delivery hub must be subject to robust and independent governance. Early thinking is that this should consist of: an executive board to oversee delivery of the roadmap and the Hub's work programme; a small business steering group; an ongoing role for the Task Force; and a transparent and sustainable funding model.

Metrics and monitoring.

Early priorities for the Hub will be to translate the goals into a sector-wide set of performance metrics and to develop monitoring methods for the metrics. These metrics will form the basis for raising standards across the whole industry while providing a clear and objective basis for those who want to go further to differentiate.

The Hub should also oversee progress towards implementing the standards and commitments and the barriers to progress.

Small business and inclusivity.

The Hub should be designed to meet the needs of small businesses, providing the outputs they need in accessible formats at the right time. A small developer group or groups should therefore help inform both the design of the Hub and its operation.

Similarly, the Hub should cater for all types of new home developer (for example, private, public and social housing) and look at solutions for all housing typologies (for example, detached, terraced or apartments).

Putting customers at the heart of delivery.

Throughout the Task Force process, a continued priority has been to recognise that home building is a customer-facing activity and that successful change must put the customer at the centre and actively engage the consumer to increase appetite for new homes build to new standards.

The Hub will therefore consistently need to look through the customer lens as it works with industry to design solutions, communicating the customer benefits of sustainable homes and providing support for using new technologies.

Success will be dependent upon future owner, occupiers, employers and

communities understanding the impact and benefits.

Connecting support initiatives and organisations.

The Task Force recognises that meeting the set of sector-wide challenges will require everyone to work in concert. The Future Homes roadmap for the first time provides a single, sector-wide plan for the whole industry. To be effective, we must also collectively ensure that we align, connect and achieve consistency between this plan and any wider plans rather than to duplicate. Work is therefore underway to connect into other relevant plans such as the Construction Leadership Council's **CO2nstructzero plan** and the **UK Green Building Council's** roadmap.

Strategic alignment of the delivery chain.

The Task Force also recognises that meeting the challenges effectively, coherently, efficiently, with the timeframes set and while managing parallel risks for example to safety, depends on all those who play a part in the delivery chain facing in the same direction and working in a mutually supportive way. This includes, for example, the finance sector, local governance and planners, infrastructure and utilities, supply chains, skills and certification and warranty providers.

Future Homes Task Force background and process

A Housing and Environment Summit in January 2020, called for an industry-led strategic plan for climate and environment.

60 senior stakeholders met on 6 January 2020, from across developer and related industries, government, regulators, environmental and expert communities to discuss how best to tackle the environmental challenges facing the development of new homes.

There was widespread consensus on the need to act, that success was only possible if all those involved in the process of home building worked together towards common goals and of the need for a carefully sequenced and structured plan. There was also a clear view that the development sector was best placed to understand

the process of innovation and change and should adopt a leadership position in taking the plan forward.

The conclusion of the summit was that stakeholders should therefore work collaboratively under the guidance of a high-level task force to develop a strategic industry-led climate and environment plan.

The Future Homes Task Force oversaw development of the strategic plan.

Following the initial phase of the pandemic, representatives from different parts of the home builder and supply chain industries, government, regulators and related stakeholder groups were asked to join the Future Homes Task Force to oversee the development of the plan between September 2020 and March 2021.

The objective was to develop a strategic delivery framework commensurate with the challenge of building new homes at the scale needed in line with our climate, environment and wider sustainability goals. The Future Homes Task Force's vision is to deliver sustainable homes and places at a sector-wide scale that are great to live in and that we as a generation can be proud of.

The outputs were to identify the:

- commitments the new homes sector should make to achieving environmental goals
- strategic roadmap for meeting the commitments including the enabling actions
- implementation arrangements including the delivery hub to facilitate implementation of the roadmap.

The process involved intensive engagement with all relevant stakeholders.

The Task Force process, managed by a small joint secretariat under the **Home Builders Federation** and the **Broadway Initiative**, involved intensive engagement to understand the operational issues for all those involved in the development of new homes and the views of different stakeholders. This engagement included the following:

- surveys of the home building sector and wider stakeholders
- post-first lockdown summit
- core group of home builders
- proposal development workshops
- home builders technical directors' group
- briefings on emerging proposals with home builder and other communities.

SECTION 1: context to homes and the environment

The environmental big picture



Environmental pressures are increasingly recognised as amongst the greatest challenges to humanity in the 21st century.

At a global level, climate change is already having significant effects on the earth's weather systems, including extreme events such as hurricanes and heatwaves, and is rapidly intensifying.

The Earth has warmed by over 1.1°C since the late 19th century, and is set to warm further until net greenhouse gas emissions reduce to zero, with significant further warming already locked in.

Pressures on the UK's immediate natural resource base are already a public and government concern and are also intensifying.

The Government's **25 Year Environment Plan** and associated strategies document the impacts for example of droughts, floods, poor air quality on the instances of major diseases, soil degradation, plastics in the marine environment, poor access to greenspace in some parts of the country and wildlife decline. There is a projected deficit of 1,220 to 2,990 million litres of water per day across the UK by 2050 (CCC, 2021).

At the same time global pressures on natural resources are increasing.

At global level energy demand is projected to increase by 30–40% over the coming 20 years (IEA, 2013), water demand will increase by 30% by 2030, demand for food will increase by 50% by 2030, demand for materials, is projected to double again by 2030 (SERI, 2013) and material waste to quadruple by 2100. This will be

caused not only by global population growth (expected to rise to 9.6 billion in 2050 and 10.7 by 2100 from 7.6 billion in 2018) but also from increasing urbanisation and consumption – 68% of global population is expected to live in urban areas by 2050 (United Nations, 2018).

Countries like the UK will also become more vulnerable to these global pressures as the 21st century progresses.

The UK relies heavily on other parts of the world to meet demand for resources. 62% of the UK's total water footprint (4,645 litres per person per day) comes from other countries' water systems (UK Water Footprint, WWF). Over 60% of timber is imported. We import 36% of the energy we directly use, which does not capture our total energy footprint. 58% of metal ores consumed in the EU-28 in 2013 are imported.

The World Economic Forum (WEF) has identified ten global risks of the highest concern for business. Four of these – concerning water, food, climate change responses and extreme weather events – relate directly to the environment.

In total the **Global Footprinting Network** estimates that the UK is currently using resources as if there were 2.85 planets. Most developed nations are using resources well above one planet, but that trend will become more problematic with much greater competition for resources with rapid economic growth in developing countries.



The new government framework for climate and environment



The scale and systemic nature of the environmental challenges ahead inevitably need to be tackled at a **structural level**. UK Government and devolved counterparts are therefore responding to the scale of the environmental challenges by putting in place frameworks that will require economic activities to adjust to tackle these challenges in meeting wider social and economic objectives.

In England, four key elements of that framework fundamental to building homes are:



1. The Climate Change Act and net zero target

The Climate Change Act 2008 legally commits the Government to ensuring that the UK reaches the national Greenhouse Gas emissions target by 2050. It contains a system of five yearly carbon budgets, carbon reduction programmes and independent advice from the Climate Change Committee, to which the Government has to respond. The national target was increased in 2019 to be 'net zero' greenhouse gas emissions by 2050, in line with the 2015 Paris Agreement.

In December 2020, the Government then committed to 68% reduction (compared to 1990 levels) by 2030 as its Nationally Determined Contribution to meeting the Paris Agreement; and in April 2021 to 78% reduction by 2035. The Climate Change Committee set out a high level set of pathways for different sectors of the economy in its 6th Carbon Budget in December 2020, including its advice on implementation of the Future Homes Standard. During 2021, the Government is due to publish its Net Zero Strategy, which is expected to build on sectoral strategies such as the Energy White Paper, Industrial Decarbonisation Strategy and Heat and Buildings Strategy to set out the Government's overall plan for meeting net zero.

2. The Environment Bill, targets and Biodiversity Net Gain

In parallel to the Climate Change Act, the Environment Bill also sets out a long term framework for meeting wider environmental goals. It requires the Government to set long term legally binding targets covering water, nature, air quality and resources by 2022. It also contains a system of interim targets, a five-yearly cycle of national 'Environmental Improvement Plans', monitoring and reporting arrangements and an independent body called the 'Office of Environmental Protection' to provide independent oversight.

The Bill also introduces the requirement for 10% Biodiversity Net Gain for new homes development and a system of Local Nature Recovery Strategies to identify spatially where investment in biodiversity should be targeted as it's not just a policy on new homes.

3. The National Design Guide and National Model Design Code

The National Design Guide and National Model Design Code provide a common framework for designing places including how the full range of sustainability issues should be incorporated into design, as part of the Government's planning practice guidance.

The National Design Code sets out the ten characteristics that need to be considered and the National Model Design Code provides more detailed guidance on the production of design codes, policies and guides. Increasingly these documents will inform how local planning authorities consider proposals.



4. The National Adaptation Programme

The Climate Change Act also establishes the policy framework for adapting to the impacts of climate change. For new homes this includes issues such as water stress, flood risk management, overheating and wider changes on nature and the natural environment.

The framework includes a five-year cycle of climate change risk assessments and National Adaptation Programmes. The National Adaptation Programme is the Government's strategy to address the main risks and opportunities identified in the risk assessment.

The latest Climate Change Risk Assessment was published by the Climate Change Committee on 16 June 2021, with the next National Adaptation Programme due in 2023.



June 2021

Independent Assessment of UK Climate Risk

Advice to Government
For the UK's third Climate Change Risk Assessment (CCRA3)



Translating the framework into a structured plan for new homes



The greatest set of challenges home building has faced.

Taken together, the environmental targets and goals which face home building, constitute the biggest set of challenges the industry has probably ever experienced.

Building zero carbon ready homes alone, required by the Future Homes Standard, means fundamentally changing the way we design and build homes.

Simultaneously, as legally backed national targets are translated into specific policies affecting home building, we will need to reach net zero emissions for the whole lifecycle of the building, including the embodied carbon in the products and processes for construction of homes; and net zero for how business operations are managed more widely.

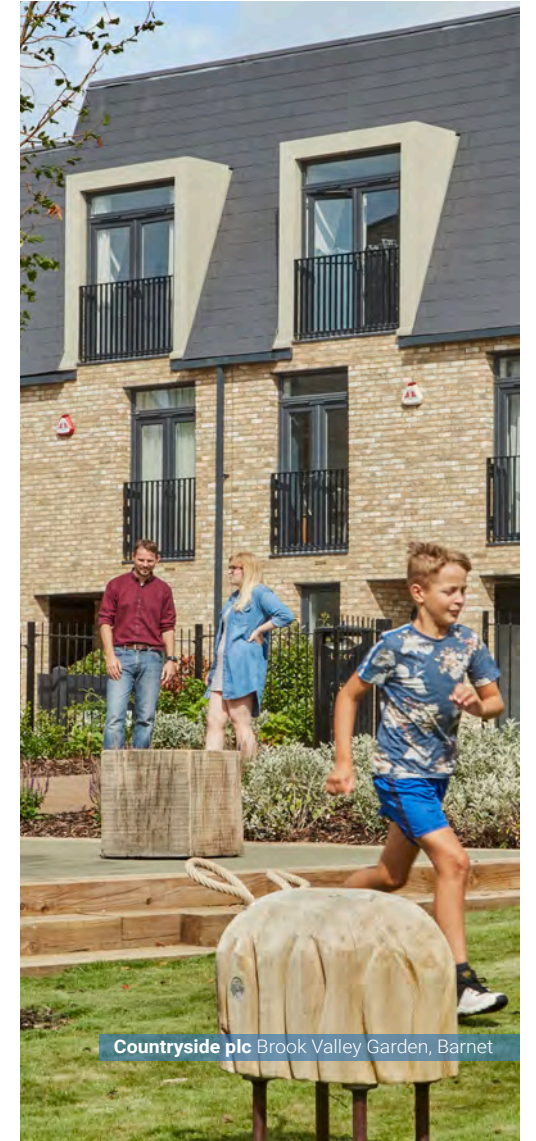
Home building will be required to make its fair contribution to restoring nature and to the Government's commitment to being the first generation to improve the natural environment, with the requirement for Biodiversity Net Gain a key feature of the new Environment Bill.

Government targets for resource productivity, water efficiency and air quality will all affect how homes are built and operate. Local authorities will simultaneously be requiring a more comprehensive set of design requirements to factor climate, nature, resources, resilience and other environmental issues into how homes are planned and laid out.

Environmental challenges are with us for the long term.

While in the past some environmental policies such as the zero homes policy and site waste management plans have been short-lived, these legally backed long term targets and policies seem certain to remain at least for the next generation. From a science perspective the issues are intensifying.

Public opinion is increasingly prioritising this set of issues, for example a recent opinion poll² showed 81% of the British public view climate change as a global emergency. All the major political parties prioritised environmental issues at the last general election. Investors are increasingly making decisions based on environmental, social and governance (ESG) criteria.



Countryside plc Brook Valley Garden, Barnet

Understanding the context for home building.

Thinking and action to meet these challenges must stem from an understanding of home building and delivery. While from the outside home building may appear a comparatively simple process, it is in fact an extremely complex one where economic, political, consumer and regulatory factors all affect commercial decisions and risk and also interact with each other.

We therefore need a well-designed plan that recognises the commercial and operational context within which homes are designed and built. Failure to bring the customer with us will undermine the ability of the sector to deliver on environmental objectives effectively. Amongst others the following factors must be understood.

²https://www.bbc.co.uk/news/science-environment-55802902?utm_campaign=Carbon%20Brief%20Daily%20Briefing&utm_content=20210127&utm_medium=email&utm_source=Revue%20Daily

The social and government objective to build more homes.

The last three decades have seen substantial under supply of new homes. In turn this has led to problems of affordability across all housing tenures as evidenced by the Affordable Housing Commission's 2020 report, problems of home ownership for younger people, reduced ability to move across the age spectrum and consequentially impaired labour mobility and economic performance.

In response, government has set a target – of 300,000 new homes a year by the mid-2020s. The environment strategy therefore needs to be designed in a way that doesn't overall undermine viability or continued progress towards meeting this target.

The industry structure and specifically the context for smaller developers.

Home building is a diverse sector. Developers range in scale from building in single digits to developing in the tens of thousands per year.

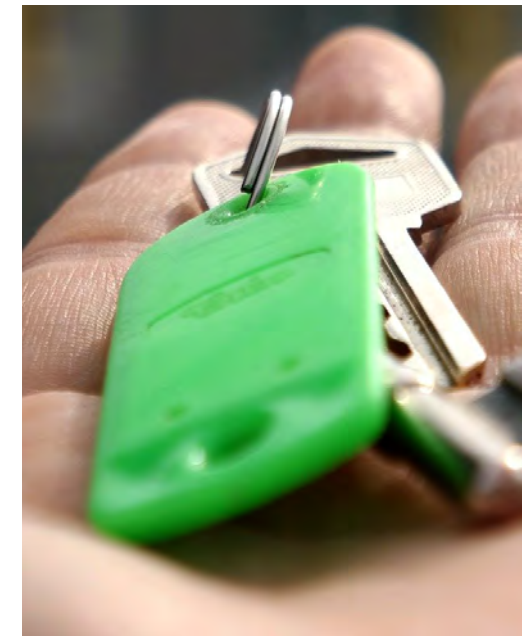
As well as private, housing associations and local authorities have their own new build programmes. There are different types of home (from terraced to apartments). We are also seeing the growth of new build to rent developers backed by institutional investment and strong interest in self and custom build. In 1988 there were some 12,000 active home builders, but this number has now fallen to around 2,500.

Over the same period the percentage of new homes built by small firms has fallen from 40 to 12%. By contrast the 10 to 15 largest national builders, who are best able to manage the risks inherent in the market context and can access finance on better terms, between them contribute 50% of annual new build supply.

The decline of SMEs in the sector has become a particular concern, with initiatives from government and with trade bodies to tackle the structural causes.

The strategy therefore needs to recognise the circumstances across these different parts of the sector and ensure we do not inadvertently further adversely

affect the business climate in ways which could reduce market diversity, disadvantage SMEs and create additional barriers to market entry.



SECTION 1

Putting customers at the heart of delivery. Housing is a mass retail market where consumers make choices based on location, affordability, size, type of home, tenure, new build or existing, layout, design and many other features.

There are real consumer challenges in implementing significant change on environmental objectives. Such change will entail new designs, new technologies and potentially new construction methods for the next generation of homes, that bring opportunities to improve, but also significant real and perceived risks to, customer experience. It's therefore vital that improving experience for the customer is at the heart of new designs and delivery.

Failing to bring the customer with us, will create reputational issues for home building, undermine the ability to deliver the quantity of homes needed and undermine the sector's appetite to embrace transformational change.

Furthermore, there is an important role to actively engage the

consumer to increase appetite for new homes built to new standards.

At the same time, we should recognise that our homes and neighbourhood are fundamentally our environment. The quality of that local environment such as nature, greenspace and the quality of the air are major factors for many homebuyers, especially in the context of the Covid-19 pandemic.

The Task Force has consistently been concerned that the strategic plan puts the customer at the centre and ultimately positively contributes to wider societal wellbeing. An important dimension of this is ensuring homes are affordable to run and that reducing consumer costs remains prioritised when selecting and installing new technologies.

The land market and project cycles. The indispensable requirement for any home builder is access to developable land at a commercially viable price.

What is developable is determined by the planning system and land provision under local development

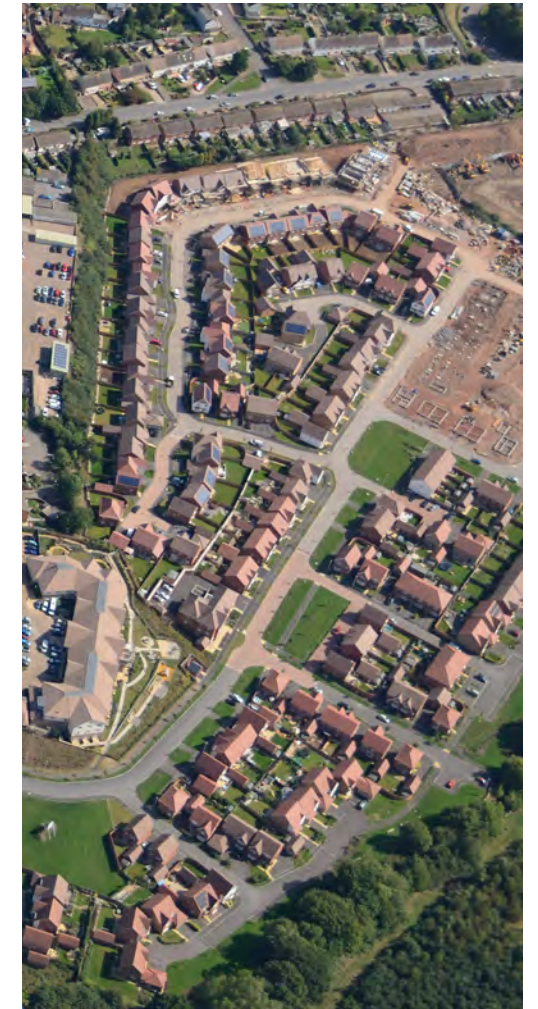
plans. Home builders compete with each other to acquire sites from landowners. Price is ultimately determined by sales prices in the local housing market context.

Home builders then assess the residual value they can offer the landowner for the site after allowing for costs including development contributions for affordable housing and local infrastructure through Section 106 and CIL. Any new or additional policy or regulatory requirements can impact on the land buying and development process and whether a site is viable to develop or not.

These issues therefore need to be understood if the twin goals of increasing housing supply and delivering environmental objectives are to be achieved.

Early integration of sustainability and environmental considerations is needed to enable home builders to factor costs into future site acquisition and allow scope for successful development and testing of new designs and technologies.

Transitional arrangements that enable developers to adapt to and implement changes will be needed to avoid unintended adverse consequences for short term housing supply or for the success and coherence of particular current developments.



SECTION 1

The ecosystem of sectors and professions that influence new homes development. While developers are at the 'sharp end' of building homes, in reality the design and shape of new homes depends fundamentally on a much wider and more complex 'supply chain' of sectors and professions.

This includes but is not limited to: government policymakers across departments; investors and the rating agencies they use; local planning authorities; the planning and consultancy profession more broadly; regulators such as Ofgem, OFWAT, the Environment Agency, Natural England and local building control; strategic land promoters; energy infrastructure providers including the electricity and gas networks and energy companies; wider infrastructure sectors including: water, waste, communications and transport; supply chains; warranty providers; conservation bodies; contractors and trades; valuers and surveyors and skills and training providers.

In this context, developers are constrained in their ability to achieve fundamental change without all these communities

understanding and mutually supporting a shared direction of travel and plan.

Co-dependent environmental and other operational issues. Home building requires consideration of a wide set of environmental and wider operational issues. These issues are sometimes synergistic and sometimes in tension. For example, thinking of environmental issues alone, there could be synergies in terms of carbon, materials and water efficiency, both in the resources used to build homes but also during operation.

Conversely there might be trade-offs between reducing carbon in operation and reducing carbon embodied within the materials and construction phase, for example total carbon emissions might increase if more energy efficient products have to be transported substantially longer distances.

Similarly, there is a wider set of operational issues such as safety, health, comfort, inclusion, resilience, and aesthetics with potential for synergies, tensions or trade-offs.

The more home builders and co-dependent sectors are able to consider linked issues together from a design perspective and not in silos, the more likely it is that they can all be achieved, synergies exploited, trade-offs and risks managed and better value achieved overall.



Countryside plc Acton Gardens, London



Inland Homes plc Hillingdon Gardens

Managing innovation and delivery at scale safely and smoothly.

The technologies and methods needed to meet the set of environmental challenges we face are almost all available and being used today in 'pockets'. However, they are not yet being used in combination and at scale.

For example, even for zero carbon ready homes, while all the technologies required are available and being used (such as heat pumps, ultra high energy efficiency measures, renewables, technologies like mechanical ventilation heat recovery and demand management tools), few home builders have customer feedback at scale for their use together.

As for other manufacturing processes, home builders need to go through what is effectively a product innovation process before rolling out new technologies across their standard house types where used. This testing process involves testing individual technologies, testing technologies in combination at a house level

and, where possible, testing the combination of technologies in operation. The purpose is to identify and correct issues before rolling out at scale.

This includes for example safety risks, risks of technologies not performing as expected (especially once the human factor is introduced) or technologies negatively impacting each other. The innovation process can draw on collective existing knowledge and be managed sector-wide to achieve economies of scale. By factoring this sector-wide innovation process into timelines we can mitigate implementation risks.

We can only succeed with a proactive and structured framework for collaboration.

Given the factors above, to confront the set of environmental challenges successfully, we need a strategic delivery plan that:

- **is well structured and sequenced** – joining up the set of operational issues that home

building needs to consider, giving early certainty about what will be required of new homes, allowing sufficient lead in times to factor into investments, sequencing change realistically accelerating priorities and dealing with issues together where beneficial. Parts of the plan may benefit from regulation to create a level playing field

- **is sector-wide** – bringing the whole sector within a single plan, catering for and understanding the economics of all parts of the home building sector. This means especially understanding and catering for the needs of smaller developers, including by making technical capacity readily accessible.
- **facilitates collaboration between the co-dependent sectors involved in building homes** – getting everyone to face in the same direction and work to the same plan to unlock fundamental change and increasingly make developing sustainable and high quality homes the path of least resistance. In parallel, joining up existing sustainability initiatives

(see page 50) so that they become more than the sum of their parts

- **is durable** – to give everyone confidence that the plan will be sustained, especially given that previous environmental policies for home building have not always endured. The proposed approach to achieving this durability is discussed further in the next two sections
- **puts experience and value for the customer at the heart of change** – this is further discussed in section 3.



The win-wins from partnership.

There are multiple potential wins from achieving a solid framework for partnership:

- Higher chance of achieving environmental results
- Building better quality homes and creating more attractive places for customers to live in
- Being ready as the next generation expect more advanced sustainable technologies
- Reducing the costs of transition
- Developing domestic supply chains, new skills and jobs
- Improving the reputation of the home building industry and attracting more investment.

8 key messages we heard during engagement on the process

- 1 This process fills a big gap in establishing a framework for delivery on net zero and sustainability that works for the mainstream.
- 2 There is appetite across the home building sector to play a greater leadership role in meeting environmental challenges proactively, especially given legally binding targets at national level, rather than wait and respond policy by policy.
- 3 The roadmap gives developers of different sizes greater visibility of what needs to be achieved and confidence to start planning sustainability into operations, whereas until now the direction has not been sufficiently clear to act boldly.
- 4 The engagement process has been inclusive and has attracted buy in and a sense of co-ownership across both the home building sector and wider stakeholders.
- 5 While guided by the ambition to establish the contribution the home building sector need to make to meeting government commitments and solving environmental challenges, we have also consistently scrutinised practical deliverability across the whole sector, within the commercial operating context and the steps needed to support delivery.
- 6 The roadmap and delivery hub provides the industry the basis to join the dots and improve development in total terms, by bringing the issues together. Homebuilding has historically suffered from siloing of policy issues which leads to developers looking to solve one issue at a time but in reality issues need to be considered together. For example: energy efficiency, overheating, space standards, accessibility, safety and beauty when designing the house form.
- 7 Similarly, the roadmap and hub is necessary to enable the sector to deal with synergistic areas together – such as energy and water efficiency – as well as how to avoid perverse effects for example increasing carbon emissions overall if embodied and operational carbon is not considered together.
- 8 The commitments, roadmap and delivery hub also have a critical role in joining up existing initiatives as far as possible there is a single set of asks, supported by joined up technical and delivery support. There is already a wealth of information and analysis to bring in to the mainstream.

SECTION 2: goals, commitments and roadmap



Headlines

The Future Homes strategic plan aims to support sector-wide delivery of homes that meet the Government's climate and environmental targets, while consistently improving customer satisfaction, with:

- High-quality homes that are zero carbon ready, sustainable, while being healthy, safe and comfortable from 2025
- Places and developments that are consistently low carbon, nature-rich, resilient, healthy well designed and beautiful by 2025
- Production and construction methods that are net zero and sustainable by 2050 with substantial progress by 2025 and 2030
- Businesses operations in line with the Race to Zero: net zero by 2050 with a 50% reduction by 2030

The structure of the goals, commitments and roadmap



Organising the challenge into business domains where change is needed.

The sector-wide plan has therefore been developed to translate the national policy framework into a structured and sequenced delivery plan. The plan is organised into four domains, reflecting the business activities that shape the environment.

- Performance of homes in operation
- Planning and site design
- The production and construction process
- The wider business.



Sequencing goals and commitments to plan for transformational change.

The table on page 26 shows the goals structured into time periods from 2025, 2030 and 2040 to facilitate collaborative planning for sector-wide transformation. The set of relevant environmental issues are considered together within each domain to enable joined-up thinking for example, about how homes can be designed to be zero carbon, water efficient, comfortable and safe at the same time.

While some of the goals have firm metrics and targets, others do not yet. One of the first activities of the delivery hub is therefore to complete the set of industry-wide metrics.

Roadmaps as 'staircase' to support sector-wide change.



For each domain there is a roadmap which sets out the current view of the 'staircase' of enabling steps that need to be taken across the sector to support the change.

This includes the collaborative activities that will be undertaken through the delivery hub and asks to government to help facilitate change.

This approach is particularly important for smaller developers to ensure sufficient timescales and the ability to share learnings across the industry. The roadmaps set out here are the initial position

and will develop and evolve under the governance arrangements described later.

Leveraging existing research and knowledge.

- We will not be taking these enabling steps under the domain roadmaps with a blank sheet of paper
- Through the engagement undertaken by and for the Task Force much existing knowledge and research has been referenced and contributed to thinking. It is important this informs the delivery hub's work and that relevant expertise is involved in identifying the right course to take for the enabling actions
- This will be a core principle of future work.

The compact and partnership with government

The need for a compact.

Implementation depends on everyone facing in the same direction and having the confidence that the plan will stick. Too often in the past, collective confidence has been undermined. Achieving durability has therefore consistently been raised as essential in conversation with the Task Force, the industry, government and wider stakeholders.

The common view is that a compact is needed. The delivery hub is then the vehicle for bringing together the necessary collaborations to achieve the goals, own enabling steps in the roadmap and oversee and unblock progress.

The nature of the compact and commitment.

The compact is a commitment by all key stakeholders to work collectively on the same set of goals, to create the social consensus and durability needed to achieve long term change. Some of the goals have already been defined

in detail and to a greater or lesser extent pinned down into legislation for example, in the case of the Future Homes Standard and an early task is to develop a consistent set of industry-wide metrics or KPIs so that everyone understands direction of travel and how performance can be assessed.

This also forms the basis of aligning financial products with the roadmap and enabling firms to differentiate. Many of the commitments can then subsequently be formalised either as government standards or as formal industry targets. There is further enabling work, analysis and consultation before that can be done.

‘Signing up’ to the compact is therefore a commitment to work in good faith to help achieve the objectives collaboratively.

The importance of government collaboration.

Collaboration does not remove government’s ability to take the

decisions that it needs to, but secures the ability for joint planning amongst the community needed to:

- **deliver widespread confidence that the plan is in line with government’s objectives.** By taking early planned action in line with those objectives, the chances of unexpected or short term policy announcements quickly recedes, and there is opportunity for early dialogue about the practical enabling steps and quickest delivery timetables to meet priority objectives
- **achieve effective delivery.** Alongside the several enabling sectors, government either directly holds or has strong influences over many of the keys to the change required, whether it is policy levers, sponsorship of arms length bodies or regulation, influence or authority over wider stakeholders who can help achieve change. This collaboration will be achieved by government’s visible support, co-investment and participation

in the delivery hub.

Partnership does not remove government’s ability to take the decisions that it needs to, but secures the ability for collaborative planning amongst the community needed to deliver

How the compact deals with changing circumstances.

The compact and commitment also needs to be resilient to changing circumstances, for example as the science changes and the Climate Change Committee’s independent advice on the economy-wide pathways adapts, or understanding evolves of what is feasible understanding of feasibility as more detailed analysis is undertaken, evolves.

As the facts change, so too should commitments be able to, if the compact is to remain relevant and be durable, but there must be credible system of governance to oversee the plan and hub.

Summary timelines of sector-wide goals and commitments

	HEADLINE GOAL	FROM 2025	FROM 2030	FROM 2040
Homes that are:	Zero carbon ready	Zero carbon ready (for regulated energy) across all homes, with very high fabric efficiency standards. (kWh/m2/yr; precise levels to be determined). Investigation of how further to reduce energy demand and emissions sector-wide.		
	Healthy, safe and comfortable	Target levels to be set for 2025 for interlinked elements such as: overheating, air quality, sound, space and accessibility, safety and daylighting.		
	Water efficient	Work with government to develop a roadmap in 2022 to achieve greater water efficiency in new development, including exploring the role for a fittings approach, for new technologies and innovative water systems and the potential for future targets for reducing water use in 2025 and 2030.		
	Designed for sustainable living	Incorporate technologies that enable sustainable lifestyles, including zero emission vehicle readiness.		
Places that:	Are well designed	All relevant applications will consistently design low carbon, nature, sustainable lifestyles, resilience, health and beauty into developments, in line with the National Model Design Code as early as possible. This will include greater connectivity with low carbon modes of transport.		
	Maximise Biodiversity Net Gain	Optimise benefits for nature and people from Biodiversity Net Gain once introduced. If appropriate, once properly analysed and understood, pilot the move to Environmental Net Gain and, work with the Government to develop the methodologies.		
	Achieve water resilience	All relevant applications give early and strategic consideration of how to proactively manage long term flood risk and water resilience, availability and quality at site and property level including the use of multi-benefit SuDS.		
	Respect environmental thresholds	Collaborative action to reduce pressure across the system, notably in areas vulnerable to nutrient overloads, water stress and floods.		
Production and construction that achieves:	Zero embodied carbon	Ambition to meet or exceed the World GBC Net Zero pathway, with rapid analysis to set robust and stretching targets for 2025, 2030 and 2040 and/or other dates as appropriate.		
	Resource efficiency	Incremental improvements and target to be set for 2025, 2030 and 2040.	Zero avoidable waste at all stages of the construction lifecycle by 2050.	
	Water efficiency	Early work to set reduction targets for, 2025, 2030 and 2040.		
		Up to 30% reduction.	Up to 40% reduction.	Up to 50% reduction.
	Low emissions to air	Air quality target to be set for 2025, 2030 and 2040.		
Businesses operations that are:	Net zero and sustainable	Establish and implement wider sustainability goals.	50% reduction in business emissions by 2030.	Net zero business emissions by 2050.

IMPROVED QUALITY AND CUSTOMER EXPERIENCE

ROADMAP: performance of homes in operation



	2021	2022	2023	2024	2025	2030	2040	2050
Government asks and actions	FHS: 1				Full Future Homes Standard.			
	Environment Bill Targets.				No petrol/diesel cars.			
	Work together on the full set of standards alongside the Future Homes Standard to ensure coherence across the issues including: to incorporate water efficiency, air quality, overheating, design for sustainable living.							
	SAP update so industry knows parameters.				Review and update SAP.			
Systematic approach	Develop sector-wide performance metrics and monitoring and communications approach, including as feedback loop to better reflect actual performance. (Horizontal across the four domains).							
	Combined approach to achieve 2021 and 2025 in all areas, by strategically reviewing process changes and design types: Innovation and design > technical specification > testing new designs > scale exemplars country-wide > post-occupancy evaluation > re-designing standards home types.							
	Work at scale with supply chain, skills and training providers, infrastructure providers, finance, certifying bodies.							
	Develop online and offline support, outreach and training, tailored to support smaller developers.							
	Take a customer lens throughout. Actively engage the customer to increase appetite for homes built to new standards. Develop home user guide templates and content.							
Zero carbon ready	- Fabric - Advanced technologies (e.g. MVHR, water heat recovery, ASHPs, GSHIPs, Pvs) - Infrastructure and switch off fossil fuels - Demand-side management (e.g. smart controls, batteries and energy aggregation)				Zero carbon ready homes.			
					High fabric efficiency – kWh/m ² /yr metric.			
Healthy and comfortable	Ensure overheating is mitigated whilst increasing airtightness.				Target levels to be set for overheating, air quality, sound, space and accessibility, safety and daylighting.			
Water efficiency	Work with government to develop a roadmap in 2022 to achieve greater water efficiency in new development, including exploring the role for a fittings approach, for new technologies and innovative water systems and the potential for future targets for reducing water use in 2025 and 2030.				Potential water reduction targets for 2025 and 2030.			
Designed for sustainable living	Longer-term design measures to allow home users to live sustainably reflecting changing needs of occupants and the community.				Incorporate zero emission vehicle readiness and other sustainable lifestyle enabling technologies as appropriate.			

Performance of homes in operation roadmap: introduction and context

The first roadmap domain is the building itself, covering all aspects of the design and operation of the home. There are substantial interactions; for example, between meeting the Future Homes Standard and standards for overheating, space standards, safety, indoor air quality and water efficiency.

This cross-cutting approach is essential to ensure issues can be considered together, co-benefits are optimised, and any trade-offs properly understood.



Explaining the goals and commitments

ZERO CARBON READY

Zero carbon ready (for regulated energy) across all homes, with very

high fabric efficiency standards. (kWh/m²/yr; precise levels to be determined). Investigation of how further to reduce energy demand and emissions sector-wide.

Alignment with the Future Homes Standard. This commitment is in line with the Government's Future Homes Standard and the Climate Change Committee's advice on the contribution required for new homes.

The Government has signalled that the standard will be at a level which enables homes to become zero carbon for currently regulated emissions as the electricity grid continues to decarbonise. High energy efficiency standards will be needed to avoid future retrofit and reduce pressure on the grid. Consideration will be needed of the actual performance standards that can be set for different housing typologies.

Beyond the Future Homes Standard. Several developers are already taking action to reduce operational emissions more rapidly than the Future Homes Standard and to get to zero carbon in advance of decarbonisation of the grid. The Hub will investigate the

scope to further reduce energy demand and emissions across the sector, as part of a system-wide approach to reducing emissions, including the role of new homes in reducing unregulated emissions and the contribution that might be made to reducing energy use through modern demand management systems and technologies.

HEALTHY, SAFE AND COMFORTABLE

Target levels to be set for 2025 for interlinked elements such as: overheating, air quality, sound, space and accessibility, safety and daylighting.

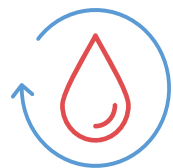
Early sight of recommended standards for the customer. Moving to zero carbon ready homes will require significant design changes. Developers are more likely to be able to achieve good outcomes for the range of interconnected issues if the full set of standards is clear as early as possible.

Experience and research in recent years has shown that, without careful consideration, homes designed to achieve higher levels of

energy efficiency performance can result in unintended negative consequences. These have included: poor indoor air quality due to airtightness, emissions from construction materials, and unsuitable ventilation strategies; increased risk of summertime overheating due to an imbalance of thermal mass, solar shading and night time ventilation; and reduced levels of natural daylighting due to reductions in glazing areas.

These consequential impacts and interactions will need to be considered for the full range of housing typologies. At the same time redesign is an opportunity to improve comfort, quality, performance and safety, and make sure that the next generation of homes improve quality of life and experience for residents.

The Hub will therefore work to identify the full set of target levels for 2025 as early as possible, building on existing industry standards where available, and recommend them as future building standards.



WATER EFFICIENT.

Work with government to develop a roadmap in 2022 to achieve greater water

efficiency in new development, including exploring the role for a fittings approach, for new technologies and innovative water systems and the potential for future targets for reducing water use in 2025 and 2030.

Translating new national level water reduction targets.

Government has indicated that it will set a target to reduce water demand under the Environment Bill during 2022. There is a projected deficit of 1,220 to 2,990 million litres per day across the UK by 2050, exacerbated by climate change.

Early action is needed to avoid the risk that water stress constrains our ability to develop to meet housing needs, particularly in the south and east of the UK. Reducing water use also helps reduce carbon emissions, through reducing emissions caused by pumping, treating, and heating water.

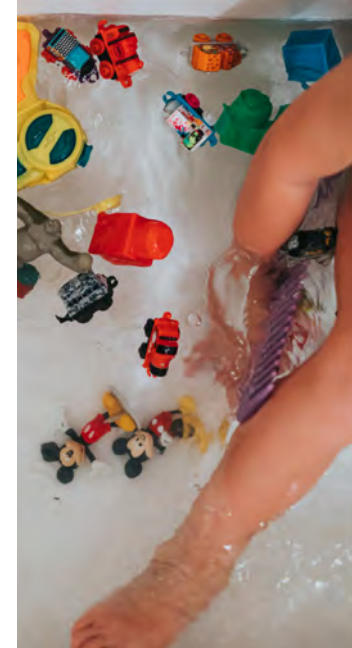
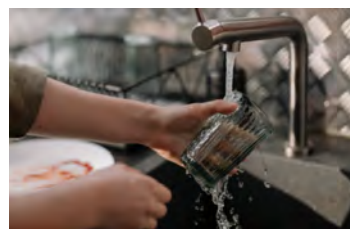
Working with the Government on further water efficiency measures.

The Government ran a consultation from July to October 2019 on measures to reduce personal water use. Following that consultation, the Defra Secretary of State confirmed in a Written Ministerial Statement on 1 July 2020 that the Government would:

- make regulations to introduce a mandatory water efficiency label to inform consumers and encourage the purchase of more water efficient products for both domestic and business use. We will consider the potential to achieve energy savings, as well as further water savings, and explore how these can be achieved in a way that minimises the impact on consumers;
- write to local authorities to encourage them to adopt the optional minimum building standard of 110 litres per person per day in all new builds where there is a clear local need, such as in water stressed areas;
- in 2022 develop a roadmap towards greater water efficiency in new developments and

retrofits, including the exploration of revised building regulations and how the development of new technologies can contribute to meeting these standards. We will ensure that the underlying legislation can, where appropriate, accommodate any potential future expansion of rainwater harvesting, water re-use and storage options.

The Future Homes Delivery Hub will work with the Government to develop the roadmap and will explore the scope for future water reduction targets for 2025 and 2030.





Establishing the role for innovative water systems.

To achieve significantly higher water efficiency, new technologies not previously required may be implemented on a wider scale; these include rainwater harvesting (RWH), where rainfall on the property is used, or greywater recycling (GWR), where water used within the house is used again, with treatment if necessary. Clearly the full implications for the development, value to the customer and costs need to be understood before recommending at scale.

However, unlike some measures for zero operational emissions, these measures have been applied widely in other countries for years, providing a significant knowledge base to draw from; these technologies haven't been widespread in the UK. Early sight of stretching targets can provide the basis for deeper innovation.

RWH is generally easier to implement, as it requires less space and technology within the home. Smart water meters should be the norm and can be

implemented at very low cost and used to help consumers understand and reduce demand. Similarly there is a role for innovation to improve water quality in catchments where the water quality is close to allowed thresholds.

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DESIGNED FOR SUSTAINABLE LIVING.

Incorporate zero emission transport readiness and other sustainable lifestyle enabling technologies as appropriate.

Homes play an essential role in the way people live their lives today, and in the case of well-designed homes, are able to adapt to their occupant's future needs as family sizes change and people's health and mobility vary over the years.

Some aspects of this are already captured by regulations (e.g. Part M) but new thinking will be required as the UK's population ages, seeks to live more sustainable lifestyles and moves en masse to electric vehicles and alternative transport modes.



SECTION 2

Explaining the roadmap

The need for systemic solution development.

Moving to zero carbon ready homes will require fundamental changes in how homes are designed and built.

Given that changes will simultaneously be required for different aspects of home performance and the high degree of interdependencies between them, it makes sense for the delivery hub to look at change across the home in a systemic way, rather than run separate siloed approaches for each objective.

This means looking at issues like specification and design, piloting, performance evaluation, working with supply chains and other partners and capacity building across these issues in a coherent, joined up way.



ASKS OF GOVERNMENT

Collaboration with government will be critical to achieving rapid and secure change in home performance. Two main areas where Government's help will be needed are:



- **Ongoing dialogue on the development of building standards.** The roadmap approach is to give the sector advance sight of future performance levels to enable planning, the right partnership to develop and the scale of innovation required to take place. This will require ongoing dialogue with government to align expectations, ensure standards for related issues cohere and ensure sufficient lead in times to enable the industry to adapt early
- **Collaboration on new Standard Assessment Procedure (SAP) models** – It is critical that government works very closely with industry to ensure first beta

development versions of SAP software are available in regular cycles (i.e. quarterly) as FHS policy refinements are being explored between 2022 – 2023. The further development of SAP for future work to go beyond the Future Homes Standard and to look more widely at energy use for services and the role of demand management will also need to be considered.

It is widely accepted that SAP plays a critical role in how housing designers, specifiers and manufacturers develop their technical solutions. Whilst not specifically intended to be a design tool, it is a major influencing factor as to which house types, construction types and building services are selected when the commercial viability of developments are being assessed. This is an iterative process that starts from the very early stages of land purchasing to ever more levels of refinement as procurement and construction commence.



Challenges and enabling steps.

Here are some of the central challenges for each of the goals and the enabling steps the Hub will need to help with.

Zero carbon ready and beyond		
Themes	Challenges	Enabling steps
New fabric types	Wide scale adoption of new methods of construction without correct testing results in unidentified systemic failures.	Work closely with MMC manufacturers and certification bodies during full scale pilot house type trials.
New building services	UK supply chain unable to provide systems correctly designed for 2025 onward demand profiles.	Create a combined technical challenge for manufacturers based upon collaboration between multiple developers of different sizes.
Energy infrastructure	Mainstream transition to electric based heating and electric vehicle infrastructure challenges capabilities of local energy networks. Uncertainty on the role of hydrogen. More below.	Use the delivery hub's position to link OFGEM, BEIS and network operators with pilot development teams to create grid readiness indicators and identify solutions.
Demand-side management	Lack of technical coordination between developers, manufacturers and network operators limits the ability of first generation zero carbon developments to interact with the wider energy system.	Include smart control and grid flexibility sector experts within hub pilot development teams to bring practical solutions that can be trialled.
Performance feedback loop	Modelled performance does not always translate into actual performance.	Monitor performance of a sample of different house types. Make monitoring confidential for a period of time and then publish data.

It should be noted that in respect of the challenges associated with this goal, there is a considerable body of existing research, work and expertise that can be drawn on.

This includes the work of the former Zero Carbon Hub, the Green Construction Board (including its 2019 Buildings Mission report), UKGBC, UKRI, the Construction Innovation Hub and a number of professional and trade bodies.

Our plan will be to draw on all this work, some of which may need to be revisited, and to involve experts from relevant bodies in the groups set up under the delivery hub to develop solutions and assist piloting and scale up activity.

Reducing ongoing consumer costs such as monthly bills should remain prioritised as developers select and install new technologies.

The energy systems and infrastructure challenge.

A core part of the strategy for shifting homes to net zero is switching energy supply to electricity as the electricity grid decarbonises, fuelled by renewable sources. This is a major transition and will require intensive collaboration between developers, energy networks, energy companies, the PropTech sector, suppliers, local authorities and others to ensure we take the positive opportunities for innovation, while managing risks and avoiding technology 'cul-de-sacs'. There will be a number of important issues to navigate including:

Additional loads on the grid from electric heating, electric vehicles and on-site renewables, requiring reinforcement.

Requirements for distribution network upgrades and therefore costs will be very context specific. This is likely to influence patterns of development, but also drive innovation in how demand is met and managed.

The wider context of increasing electricity demand.

Demand for electricity reduced by 12% from 2008 to 2018 as lighting and appliances became more energy efficient but is set to double by 2050 (CCC's balanced pathway scenario).

Electricity generation will become more intermittent.

Could become more inconsistent. Increase in renewable generation will become more intermittent and will need to be mixed with dispatchable low-carbon electricity generation including gas with carbon capture and storage, bioenergy with Carbon capture and storage and hydrogen plants.

Flexibility to manage demand and ensure security of supply.

The factors above all point to the need for developments to consider energy flexibility including demand management and shifting, storage and interconnection. Smart metering is likely to be essential. More widely the choice of technologies and home energy management systems will be critical.

The development of local and regional energy networks.

The solutions to energy supply are likely to become more localised depending on natural (for example: solar and wind availability) and human (for example: availability of industrial synergies) geography factors.

Uncertainty about the role of hydrogen and other energy sources. Foresight on what energy sources are likely to prevail in the longer term will be important to make sustainable choices on energy infrastructure.

Healthy, safe and comfortable		
Themes	Challenges	Enabling steps
Consequential impacts	House type designs dominated by space heating demand reduction increase airtightness levels resulting in poor indoor air quality and increased periods of overheating.	Coordinate specialist modelling of common property types from industry pilot developments to understand tipping points where poorer indoor air quality and thermal comfort performance is mostly likely to occur.
In-use performance	Rapid arrival of new fabric and building services technologies without increased skills and training reduces quality of construction on site.	Ensure all pilot development teams include training providers as technical designs are developed so FHS upskilling courses can be trialled with site teams.
Water efficient		
Themes	Challenges	Enabling steps
Current regulatory metrics	The existing approach to demonstrate Part G compliance is based upon litres per person per day. Stakeholders across the water sector and industry suggest a shift to a fittings-based labelling approach to simplify compliance and encourage further innovation	Use the Hub's position to collaborate across stakeholders to implement the new water efficiency measures.
Identifying practical future innovation	We are yet to see any mainstream adoption of more water efficiency technologies beyond rainwater recycling for use outside of the main dwelling systems. A new generation of innovation will be needed.	Linked to the zero carbon ready building services workstream, create a combined technical challenge for manufacturers based upon collaboration between multiple developers of different sizes.

Designed for sustainable living		
Themes	Challenges	Enabling steps
Support sustainability in general	Many home builders are developing innovations to support more sustainable lifestyles but there is no mechanism to 'mainstream' the best ones.	The Hub will provide a forum for learning from each other and working out how to scale up the most effective innovations.
Features to support the move to zero emission transport	Density targets have seen a reduction in parking spaces close to dwellings, but electric vehicles will need access to safe charging facilities.	Work closely with planners, energy network providers and electric vehicle manufacturers to understand technical requirements and explore possible layouts via pilot developments.
Spatial layout to encourage recycling and waste reduction	Some local planning requirements have encouraged space for recycling facilities, but more could be learned from other countries.	Collaborative study with local planners to understand potential of more innovative solutions such as communal underground storage and multi-functional units within homes.
Property designs to aid changing families and mobility levels	Disability access regulations have improved issues such as ground floor bathrooms, doors and staircase dimensions but more research will be needed to understand how increased use of MMC might help or hinder future extensions or internal layout modifications.	Design research with MMC associations to stress test most common construction systems against new house types being developed as part of full scale pilot developments, factoring in changes to nationally described space standards and Part M of the building regulations.

ROADMAP: planning and site design

New government policy or target

Potential target

Enabling activity done or catalysed through hub

Precondition

	2021	2022	2023	2024	2025	2030	2040	2050
Government asks and actions		Environment Bill Targets, including 10% BNG					Expand to Environmental Net Gain	
		Collaborate as part of planning reform on: how to join up environmental and development planning; how to engage local communities consistently and efficiently; and on the processes to demonstrate that the totality of sustainability requirements have been met in a user friendly way.			Implement the new planning measures. Site-level sustainability plans should apply for permissions from 2025, informed by the methods and guidance developed through the Hub.			
Systematic approach		Collaborative work with the development sector to identify: • The templates for implementing the National Model Design Code in a coherent way with Biodiversity Net Gain, the future homes standard and all the other requirements and elements in this plan • Barriers and needs for additional support • Arrangements for successful implementation including for stewardship • Demonstrator projects to facilitate shared innovation, learning and customer engagement						
		Programme to build capacity and understanding to embed integrated approaches to sustainability across industry and local government, with a focus on smaller developers.						
Well designed		Collaborative work with MHCLG's chief planning officer and the Office for Place on the programme above. During 2023 establish the activities that can be done sector-wide to integrate nature into development and help achieve the nature targets in the Environment Bill.			All relevant applications will consistently design low carbon, nature, sustainable lifestyles, resilience, health and beauty into developments, in line with the National Model Design Code as early as possible. This will include greater connectivity with low carbon modes of transport.			
Achieve water resilience		Water resilience will be incorporated into the industry-led programme above to achieve resilience to future climate projections (UKCP) including flooding and water scarcity, considering location and site design, using multi-benefit SuDs where possible and incorporating property flood resilience. This would reflect the water sector's Design & Construction Guidance. Determine how these solutions can improve water quality.			All relevant applications give early and strategic consideration of how to proactively manage long term flood risk and water resilience, availability and quality at site and property level including through the use of multi-benefit SuDs.			
Maximise Biodiversity Net Gain		Investigating the potential for strategic national approaches and partnership arrangements with the conservation community to maximise value to nature from BNG and address long-term maintenance of sites. Second in conservation body expertise to advise on incorporating best practice measures.			Optimise benefits for nature and people from Biodiversity Net Gain once introduced. If appropriate, once properly analysed and understood, pilot the move to environmental net gain and, work with government to develop the methodologies.			
		Investigate how offsite offsetting could aid increasing BNG beyond 10%. Dialogue with government to establish longer term approach to Environmental Net Gain, if supported by evidence.						
Respect environmental thresholds		Investigate the solutions that can be used where threshold issues arise such as nutrient neutrality and water neutrality pilots, and floods. Catalyse and bring together the findings from pilots.			Collaborative action to reduce pressures across the system, notably in areas vulnerable to nutrient overloads, water stress and floods.			

SECTION 2

Planning and site design: introduction and context

The second roadmap domain relates to the planning and design of developments and sites. It covers the interaction of developments with the natural environment and their resilience to climate impacts. It covers the role of design and developments in supporting low carbon, sustainable and healthy lifestyles and ensuring that sustainability and aesthetics go hand in hand.

It is concerned with designing sites residents love, implementing the National Model Design Code and other changes expected through the forthcoming Planning Bill effectively and coherently alongside wider objectives and mechanisms for improving the natural environment.

Explaining the goals and commitments



WELL DESIGNED

All relevant proposals will consistently design low carbon, nature, sustainable lifestyles, resilience, health and beauty into developments, in line with the National Model Design Code as early as possible. This will include greater connectivity with low carbon modes of transport.

Planning and design are critical to quality of life, sustainability and thriving nature.

Location, layout and design of developments, how well integrated they are with nature and the wider natural environment avoiding our most precious wildlife sites, how well connected they are to social infrastructure and how well designed they are visually are all critical to support wellbeing, sustainability and the ability to restore wildlife.

There is also an opportunity to capture trends towards more homeworking and local living in the aftermath of the pandemic with more focus on the local environment and scope to reduce carbon footprints. The Hub will work with the development sector, government and other stakeholders to help address these issues.

Designing nature into developments

To establish how to integrate nature more effectively into the design of developments and contribute to national nature targets, the Hub will second in conservation expertise to determine by the end of 2023 the activities that can be incorporated and rolled out across the sector.

Early actions that the Hub could support being taken across the sector are to:

- Provide a home buyers pack of advice for all first purchasers on the importance of the nature-friendly features incorporated into their home and its surroundings, and guiding homeowners as to how to maintain and expand on them. Encourage them to attract nature to their homes and care for it
- Act as habitat or species champions, e.g. building and designing around a priority habitat or species perhaps of local significance.
- Provide biodiversity enhancements (e.g. hedgehog highways, bird and bat roosting boxes, swift bricks, house martin nest boxes, etc.)
- Ensure qualified specialists are involved in the planning and development process throughout (e.g. ecologists and landscape architects)
- Commit to only using native species in planting schemes
- Avoid selecting invasive non-native plant species
- Use permeable surfaces, where feasible

SECTION 2

There is scope to improve on the status quo. Currently there are many different placemaking frameworks, metrics, technical guidance documents which are used to varying extents, but requirements through the planning process are inconsistent and unpredictable.

The 2020 Place Alliance report assessed that in terms of design: 26% of developments were good or very good and 54% were mediocre; in terms of public transport provision: 40% were good or very good and 30% were mediocre; performance on environmental impact, public transport and pedestrian and cycle-friendly was 'varied but challenging'; and performance on public open and play space was 'pervasively problematic'.

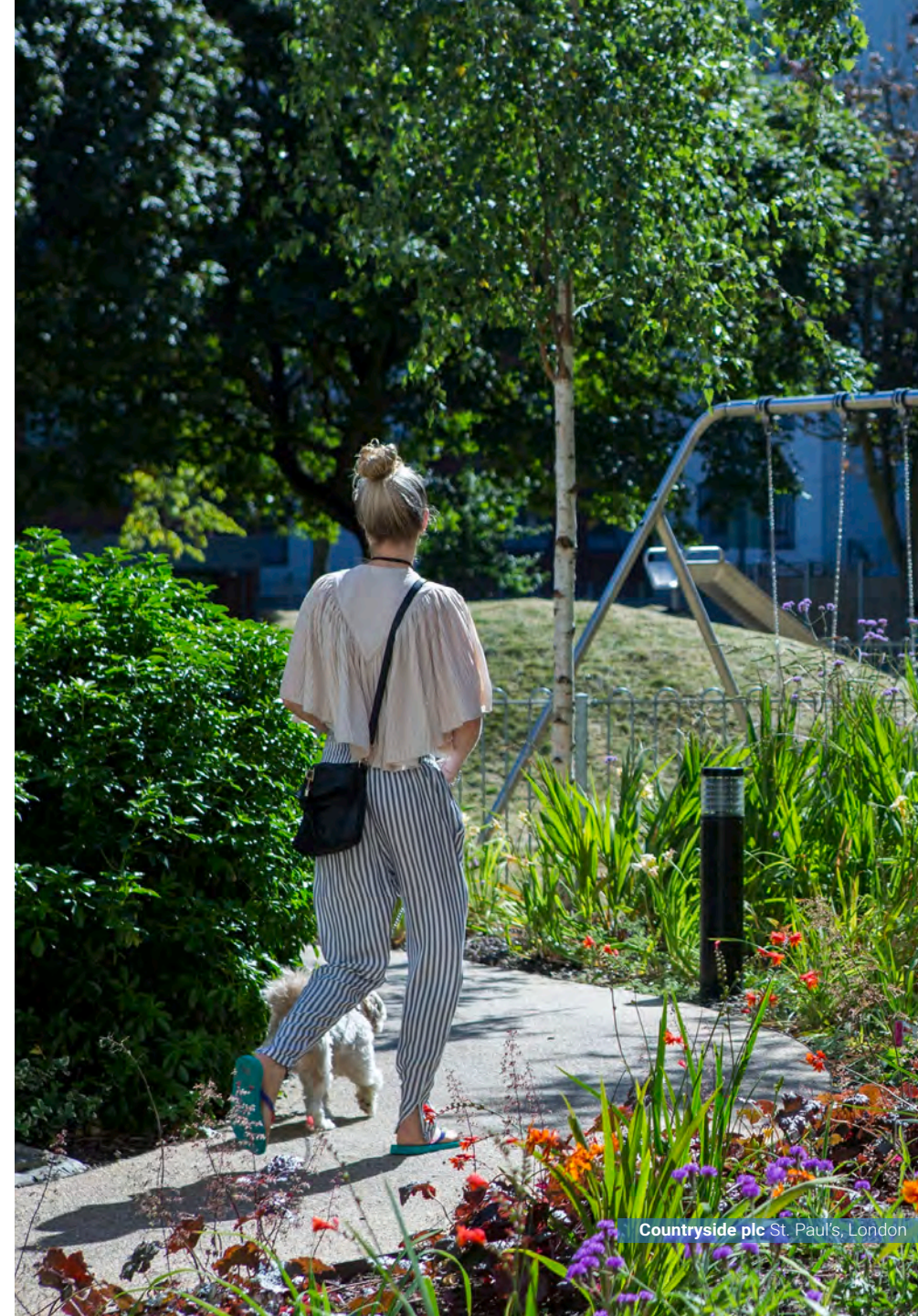
The National Design Guide and National Model Design Code can be a basis for consistently good design for sustainability. Local authorities will be looking to increase requirements for sustainability. With a coordinated approach to implementation, including collaboration between the

new hub and the Office for Place, this new framework provides an opportunity to consider decarbonisation, nature and sustainability earlier in the process, improving the design and the desirability of developments in a way that is also more predictable and consistent for developers and their investors. This will require capacity building of the development and local government sectors simultaneously to encourage a shared view of what good looks like.

Once the new targets and interim targets are set under the Environment Bill, the Hub will work with stakeholders to determine how developments can contribute to meeting them.



Thakeham Woodgate, Pease Pottage



Countryside plc St. Paul's, London



MAXIMISE BIODIVERSITY NET GAIN

Optimise benefits for nature from Biodiversity Net Gain once introduced. Enable and pilot the move to environmental net gain, learning from Biodiversity Net Gain.

Optimising benefits for nature from Biodiversity Net Gain. The Environment Bill will introduce a requirement for development to create a 10% Biodiversity Net Gain (BNG), ensuring biodiversity is not harmed, but rather enhanced.

This goal is, working with



government and others, to support effective implementation of BNG across the sector to maximise long term gains for nature, for example by applying the mitigation hierarchy, and helping to link individual measures in with Local Nature Recovery Strategies and the wider Nature Recovery Network,

and applying relevant urban green infrastructure standards. It will also involve understanding how to contribute in a more visible way to achievement of the targets being set under the Environment Bill.

It will also be important to ensure that on-site measures taken for BNG are designed seamlessly into the overall development scheme, helping to improve the quality of nature as a whole at the site over the long term.

Learning from Biodiversity Net Gain, consider piloting the move to Environmental Net Gain, if supported by the evidence. As the requirement for BNG beds in and is properly analysed and understood, the goal is to help build a robust basis for Environmental Net Gain, if supported by evidence. This will include helping to co-ordinate and share the lessons from pilots that are designed to achieve Environmental Net Gain as a whole, informed by experience from Biodiversity Net Gain and without trading one set of environmental benefits against another.



ACHIEVE WATER RESILIENCE

All relevant proposals give early and strategic consideration of how to proactively manage long term flood risk and water resilience, availability and quality at site and property level including through the use of multi-benefit SuDS.

Interactions between developments and the water environment are becoming more important as the climate changes.

There is growing acknowledgement across the sector of the role new developments can play, positive and negative, in terms of the consumption, quantity, quality and flows of water and flood resilience. These interactions are becoming more important as the impacts of climate change start to bite. As a result, alternatives to the traditional approach of drains taking the water from the surface and depositing it in the underground water infrastructure network have gradually become better understood.

Multi-benefit SuDS will increasingly become the norm. Sustainable Drainage Systems

(SuDS) are often subdivided into Grey and Green – the former represents more engineered, often underground mechanisms, and the latter denotes more nature-based solutions, including developing green and blue infrastructure.

However, MHCLG research in 2018 found that while 95% of local plan policies had requirements for SuDs for major new developments, only 25% of Lead Local Flood Authorities thought applicants understood SuDs requirements. Supplementary research found that best practice was rarely used.

The non-statutory Technical Standards for Sustainable Drainage Systems focus primarily on peak flows and volume control, and do not promote the many potential environmental and water quality benefits of multi-functional SuDS.



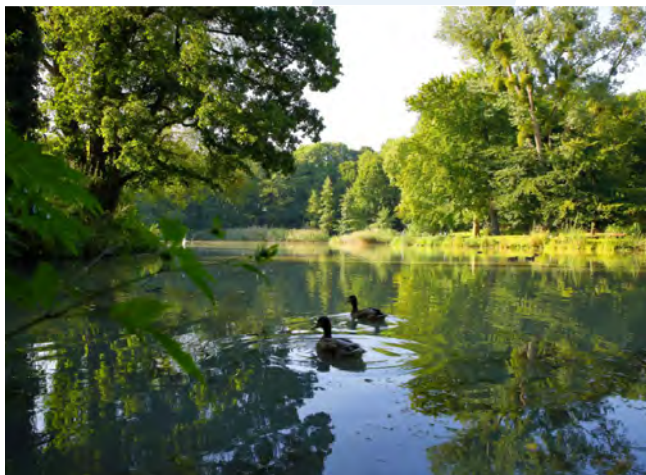
SECTION 2

All relevant proposals give early and strategic consideration to long term water resilience.

The right solutions will inevitably be very site and context specific. The goal is therefore that, wherever relevant, developments should give early and strategic consideration to what is appropriate for the given context, considering the range of advantages and disadvantages from different approaches.

Where appropriate this should also include property level measures. This assessment should be based on an understanding of current and future climate risks rather than on past data.

Mechanisms like the Task Force on Climate-Related Financial Disclosures (TCFD) requirements to disclose climate related risk will increasingly reinforce the need for climate risks to be considered early.



RESPECT ENVIRONMENTAL THRESHOLDS

Collaborative action to reduce pressures across the system, notably in areas vulnerable to nutrient overloads, water stress and floods.

Environmental thresholds are increasingly imposing a constraint on housing development. Genuinely sustainable future developments will have to ensure a variety of environmental thresholds are carefully managed.

Nutrient overloads currently represent a particularly acute issue, and water stress and flood risk are set to become more of an issue in parts of the country.

These thresholds can, in extreme cases, act as a constraint to further development, so it is in all stakeholders' interests to find practical and commercially viable mitigation strategies.

Collaborative cross sectoral action will be needed to pre-empt these issues occurring in future. Threshold issues represent a particular challenge for home builders as they can relate heavily to the activities of other sectors, which, by definition, the home building industry has minimal influence. Well coordinated, cross sector collaboration are therefore essential addressing these issues. Early work to develop and trial solutions will be key.



Barratt Developments plc Derwenthorpe, York

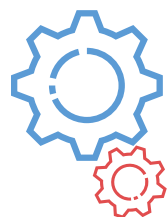
SECTION 2

Explaining the roadmap

The need for systemic solution development.

As for the performance of the home, it makes sense to look at the environmental issues that need to be considered at planning stage in a joined-up way.

The common set of activities to prepare the industry for meeting the goals includes: developing support materials, coordinating demonstrator projects and developing a programme of capacity building shared between the home building industry and local authority planners to encourage a shared view of what good looks like. The intention would be to collaborate with the Office for Place on capacity building.



ASKS OF GOVERNMENT

A few adjustments to the planning framework would substantially assist developers to incorporate sustainability objectives into developments from the start. The Task Force will work with government including through planning reform to feed in views on how to:

- **join up environment and development mapping and planning.** Currently there is no joined up spatial framework for environmental mapping (i.e. showing current environmental features) or for environmental planning (including showing what the agreed priorities are for the environment). Given that the best or most appropriate actions especially for the natural environment are highly context specific, this makes it much harder for developers who have to piece together the information needed develop environmentally positive designs

- **engage local communities consistently and efficiently.** It was repeatedly highlighted that the best examples of sustainable placemaking involved early engagement of a range of local experts and stakeholders, but that these arrangements needed to be put together on a bespoke basis each time. Setting standard protocols would help to mainstream early engagement
- **demonstrate that the totality of sustainability requirements has been met in a user friendly way.** Currently the process of demonstrating environmental performance is fragmented in terms both of the paperwork involved and the Government bodies involved. Having a clearer means of demonstrating good design would improve the conversation between developers and decision-makers, align expectations and help and encourage developers to consistently focus on improving design from the start.



Goal specific enabling steps.

Here are some of the central challenges for each of the goals and the enabling steps the Hub will need to help with.

Themes	Challenges	Enabling steps
Well designed		
Consistent implementation of the National Model Design Code	The delineation is not always clear between issues that: a) are place – and context – specific and are best dealt with through the planning system, or b) can be standardised because the solutions are not location specific and are therefore best dealt with through building regulations, creating the economies of scale required to develop partnerships and innovate rapidly. This creates a confused marketplace for both large and small developers, increasing costs and slowing delivery.	Work closely with MHCLG Chief Planning department and the Office for Place to build capacity and develop a pipeline of projects that can act as national demonstrators.
Water resilience		
Increasing climate change related flood risks require consistent planning approach and commercially viable technical solutions	There is often a mismatch between local planning, the water industry and housing developers as to what are the most practical risk management techniques to deploy and confusion as to who will be responsible for their long-term maintenance.	Embed water resilience experts into all pilot development teams from the initial planning and design stage to transfer best practice knowledge so it can be trialled at scale prior to next FHS consultation in 2023.
Realising the benefits of multi-functional SuDS in all new development	SuDS implemented in new development are often below ground ‘grey’ systems that achieve source control but no other benefits. SuDS requirements only apply to ‘major’ developments of 10 or more homes.	Revise the Non-Statutory Technical Standards for SuDS to promote multi-functional benefits such as improving water quality and the environment. Review the barriers to adoption and how to overcome them. Make the automatic right to connect surface water drains to combined sewers conditional on all other options in the drainage hierarchy being shown to be infeasible. Apply SuDS requirements to all new development regardless of size.

Themes	Challenges	Enabling steps
Biodiversity Net Gain		
Home building sector implications of future requirement for sites to create a 10% Biodiversity Net Gain.	Potential for a disparate piecemeal approach to delivery with poorer results for nature and potential disproportionate impact on smaller developers with less capacity to establish effective and cost-effective solutions.	The Hub will build on existing work for example: emerging best practice guidance by CIEEM, Local Planning Authorities, NGOs and the British Standard for Net Gain, rather than starting from scratch.
Environmental thresholds		
Proactively creating the environmental 'headroom' to enable sustainable housing growth.	The home building industry often has very minimal ability to influence the critical thresholds on their own. Without proactive engagement with sectors such as farming, manufacturing, and roads infrastructure the number of viable new developments maybe restricted in some areas.	Work collaboratively with partners in related sectors and government to develop solutions proactively.



Barratt Developments plc New Lubbesthorpe

ROADMAP: production and construction

New government
policy or target

Potential
target

Enabling activity
done or
catalysed
through hub

Precondition

		2021	2022	2023	2024	2025	2030	2040	2050
PRODUCTION AND CONSTRUCTION	Systematic approach		FHS: 1				Full Future Homes Standard.		
			Agree measurement methods, reviewing existing measurement standards, including with supply chain.						
			Measure and publish current performance across the industry.						
			Assess what reductions can be made when, reflecting the whole life environmental impacts.						
			Set targets and a detailed roadmap for how carbon, resources, water and air pollution can be reduced during the construction lifecycle, including the specific mechanisms and actions needed.						
			Understand clashes and synergies with the Future Homes Standard and other changes.						
		Meanwhile, identify quick wins that can be implemented across the sector.	Publish and support materials for the sector.						
	Zero embodied carbon			Work with supply to achieve: • EPDs for each product • Expanded supply of low/zero carbon materials • Support SMEs in selecting materials and product types			Ambition to meet or exceed the World GBC Net Zero pathway, with rapid analysis to set robust and stretching targets for 2025, 2030 and 2040 and/or other dates as appropriate.		
	Resource efficient			Work with supply chain to drive action on plastics and other waste.			Incremental improvement and target to be set for 2025, 2030 and 2040.	Zero avoidable waste at all stages of the construction lifecycle by 2050.	
	Water efficient			Connect to meter at site start to measure water use for baseline. Working with suppliers and water companies to trial and develop lower water usage options to allow scale up prior to meet the 2025 – 2040 pathway.			Up to 30% reduction.	Up to 40% reduction.	Up to 50% reduction.
Low air pollution			Collaboration with manufacturers on future machinery and site facilities.			Air quality targets to be set for 2025, 2030 and 2040.			

Production and construction: introduction and context

The third roadmap domain relates to the environmental impact of the production and construction process itself, but also repair during use and what happens to the building at end of life stage.

It covers the carbon emissions, resources used and waste generated, water used and emissions to air throughout all stages of the lifecycle of the development including the manufacture of products, construction of the development, maintaining the home during use and subsequently demolition or dismantling at end of life.

The diagram (for carbon emissions) illustrates the stages.

Whole life carbon

Embodied carbon

Product stage			Construction stage		In-use stage					End of life stage			
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4
Raw material supply	Transport	Manufacturing	Transport	Construction & installation process	Use	Maintenance	Repair	Refurbishment	Replacement	Deconstruction & demolition	Transport	Waste processing	Disposal

Operational carbon

B6	Operational energy
B7	Operational water

Cradle to gate

Cradle to practical completion

Cradle to grave

Cradle to cradle

Circular economy

Beyond building lifecycle

D

Benefits & loads

Reuse
Recovery
Recycling

2 Explaining the goals and commitments

ZERO EMBODIED CARBON

Ambition to meet or exceed the World GBC Net Zero pathway, with rapid analysis to set robust and stretching targets for 2025, 2030 and 2040 and/or other dates as appropriate.

Embodied carbon is a substantial but poorly understood component of home building carbon emissions.

Estimates of the proportion of total emissions for which embodied carbon is responsible vary significantly, ranging from of the order of 20% to 80% depending on factors such as house types, prevailing energy efficiency standards, fabric specification, construction approach and energy system used.

Clearly as energy efficiency standards improve, embodied carbon will make up a rapidly growing proportion of total emissions without simultaneous reduction measures. A significant

barrier to immediate action on embodied emissions is the lack of baselined data to understand the scope and scale of the issue.

Information on the embodied carbon of materials can be specified within an Environmental Product Declaration (EPD), but these are not available yet across all product ranges. Tackling embodied emissions requires close working for example with supply chains of both construction products and of onsite machinery.

Rapid analysis to establish the sector-wide steps to reaching zero.

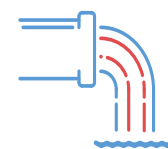
The UK's net zero 2050 commitment applies to all domestic sources of emissions, including embodied carbon. For this reason, the Hub's initial work will focus on two areas.

Firstly, determining an agreed methodology and plan for measuring and reducing embodied carbon, including targets in line with the World GBC Net Zero pathway, a process which will need to be completed by 2023. Secondly, on considering the scope and opportunities to reduce embodied carbon and avoid increasing

embodied carbon during the transition to the Future Homes Standard. The lead in times to 2025 can then be used for liaison with the supply chain to implement this methodology across all materials, to gain a full understanding of the nature of the issue, and to determine solutions to reduce embodied carbon throughout the set of materials.

Real world reductions in embodied carbon by 2025 may largely be any opportunities found as part of transition to the Future Homes Standard.

RESOURCE EFFICIENCY



Incremental improvements and target to be set for 2025, 2030 and 2040.

From 2050: Zero avoidable waste at all stages of the construction lifecycle.

Translating new national level resource efficiency and waste reduction targets. New targets are being developed under the Environment Bill. Government has indicated that these will cover resource productivity and reducing the volume of 'residual' waste we

generate. These targets are expected to be mutually supportive of the net zero target. It is beneficial to establish what contribution is expected from construction to enable the sector to plan and make changes efficiently.

Setting targets for 2025, 2030 and 2040, and the immediate actions to meet them. In parallel with

carbon emissions, and once the precise national level environmental targets are known, initial work is needed to establish the measures and plan for improving resource efficiency and reducing waste.

This should include setting targets and establishing the actions that can be taken immediately, including avoiding unnecessary single use plastics. This work will draw on experience of those companies already making commitments to reduce various waste streams.

From 2050: zero avoidable waste at all stages of the construction lifecycle. The Government's Resources and Waste Strategy aims to eliminate avoidable waste of all kinds by 2050. 92% of non-hazardous construction and demolition waste is already recovered. The Green Construction Board has done some detailed analysis of what Zero Avoidable Waste in Construction means in practical terms, leading to the proposal that the construction sector should eliminate avoidable waste at all stages of the construction lifecycle by 2050. This is therefore the proposed target, subject to further analysis.



WATER EFFICIENCY

Early work to set reduction targets for 2025, 2030 and 2040, with up to 30% reduction from 2025, up to 40% reduction from 2030 and up to 50% reduction from 2040.

Translating new national level water reduction targets. Government has indicated that it will set a target to reduce water

demand in 2022. Substantial amounts of water are used during the construction process, and it is generally thought that significant wastage occurs, but developers do not currently connect to a water meter at the start of construction. This is typically because water is inexpensive, as well as unregulated in construction.

Setting targets for 2025, 2030 and 2040. A first step is to understand the right metric, what the baseline water usage is and what scope there is to reduce consumption over what timescales.

Some companies will be more water efficient in construction than others, so setting a constant company-level percentage reduction target may penalise those who have already taken steps to reduce their water use. An alternative metric may therefore be warranted, nevertheless a percentage pathway is indicated as the goal to indicate the scale of ambition. This assessment will draw on the experience of those already

reporting on and proactively managing water use.



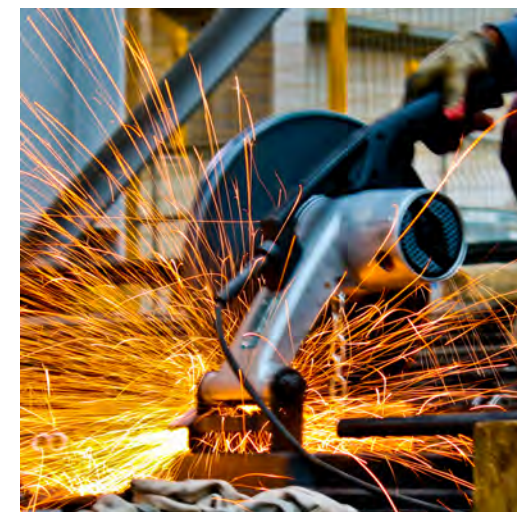
CONSTRUCTION RELATED EMISSIONS TO AIR

Air quality target to be set for 2025, 2030 and 2040.

Translating new national level air quality targets. The construction process contributes to air pollution local to the site, through emissions associated with fossil fuel power machinery, and emissions from the treatment and assembly of construction materials themselves. The Environment Bill will introduce national targets on air quality, in addition to one specifically on PM2.5 concentrations.

Setting targets for 2025, 2030 and 2040. Construction related air pollution impacts are not well understood so there is currently a lack of industry agreed long-term targets. The roadmap therefore features an early phase to measure the air pollution effects of construction, and to research how this can be reduced by action both on-site and in the design

stage. This knowledge will be used to set target for 2025, 2030 and 2040. Best practice guidance will also be created to help disseminate the findings across the sector.



SECTION 2

Explaining the roadmap

The need for systemic solution development.

Again, it makes sense to **take a joined-up approach** to managing the set of environmental issues during production and consumption.

None of them are well understood currently at a sectoral level and a common approach can be used, including to agree measurement methods, measure current performance, assess what reductions can be made, set targets and establish a detailed roadmap.

It is important to consider production and construction impacts alongside in-use performance to take a genuinely 'whole life' approach avoiding perverse effects.

Alongside developing a structured approach to tackling issues for the longer term, an early activity for the Hub will be to identify 'quick wins'

where action can be taken rapidly across the sector.

Goal specific enabling steps.

Here are some of the central challenges for each of the goals and the enabling steps the Hub will need to help with.



Eco Developments CGI, Elmsbrook, Bicester



Themes	Challenges	Enabling steps
Zero embodied carbon		
Measurement methodology and benchmarking.	Existing embodied carbon terminology and methodology is not widely understood. Once this has been agreed, baselines can be established and logical reduction steps and associated target dates can be agreed.	Convene a forum with the leading experts and chain organisations to review existing methodologies, stress test calculations using pilot development house designs and coordinate a sector-wide commitment on methodology for policy development.
Understanding design tipping point between embodied and operational carbon.	The need to take a whole life approach to avoid locking in high embodied emissions with the move to zero carbon ready houses.	Review the strategies for reducing embodied carbon simultaneously with operational carbon.
Expand supply chains for low embodied energy products.	Verification of EPDs now needs to be done rapidly. The scale of supply needed may not be available quickly enough.	Work with the supply chain to communicate needs early and identify gaps in Environmental Product Declarations. Build on the work of the RICS database. Support SMEs in comparing materials and products.
Resource efficiency		
Reduction of waste during site activities.	Home builders currently have minimal influence over how materials and systems are transported and packaged on arrival to site.	Identify the scope for recycling and take-back or circular packaging systems. Trial and establish how to roll out. Review the scope for offsite production to reduce waste.
Whole life resources.	Whole life consideration of how to increase resource productivity and eliminate avoidable waste.	Working with the Green Construction Board and others to define the detailed roadmap and short-term steps.
Water efficiency		
Baseline current water usage on site by function and phase of construction.	Water usage on site is currently unregulated and of minimal financial interest to developers. Metering needs to become a mainstream activity for large and small companies so that a baseline can be established. With this better understanding future performance targets can be set.	Use smart meters to monitor consumption consistent with the Government position set out in the Written Ministerial Statement of 1 July 2021.
Low emissions to air		
Understanding possibilities to minimise local construction related negative air quality impacts.	Very little work has been undertaken to understand what can be achieved by using lower carbon or zero carbon power sources for construction plant and machinery that also reduces air pollution.	The Hub team to convene relevant experts and suppliers to review existing practice, explore ideas for design innovations and then coordinate small scale site trials with prototypes to gauge future potential. Measures could include collaboration with the low emission non-road mobile machinery (NRMM) scheme.

ROADMAP: sustainable business

New government
policy or target

Potential
target

Enabling activity
done or
catalysed
through hub

Precondition

	2021	2022	2023	2024	2025	2030	2040	2050
SUSTAINABLE BUSINESS	Zero embodied carbon	Secure accreditation for the Future Homes plan to be part of Race to Zero.				50% reduction by 2030, moving to net zero by 2050.		
		Establish the options and actions for home building operations to meet the Race to Zero trajectory including through decarbonising business transport and working space.						
	Other environmental targets	Establish the scope to set business operation targets for the other environmental goals, for example on office water and waste, and the corresponding measures.				Potential sustainable business targets to be set.		
SUSTAINABLE BUSINESS	Across all targets	Establish how corporate reporting can be done most effectively and efficiently in line with this plan and wider requirements such as TCFD.	Track progress across all elements of the plan.					
		Identify and assess "quick wins" to achieve early progress across any of the four domains, for example to eliminate single use plastics. Additionally, the mechanism to implement at scale across the sector.						
		Publish guidance.						

Sustainable business: introduction and context

The fourth and final roadmap

domain relates to the supporting business operations of housing developers. This covers aspects such as energy use of corporate buildings, office water consumption, waste generation and employee travel.

From 2025

Establish and implement wider sustainability goals.

From 2030

50% reduction in business emissions by 2030.

In the 2040s

Net zero business emissions by 2050.

Explaining the goals and commitments



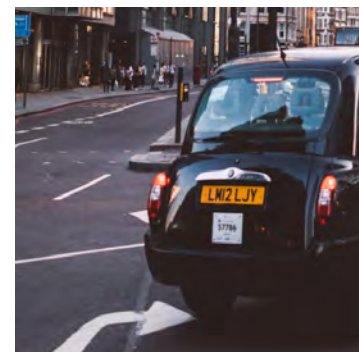
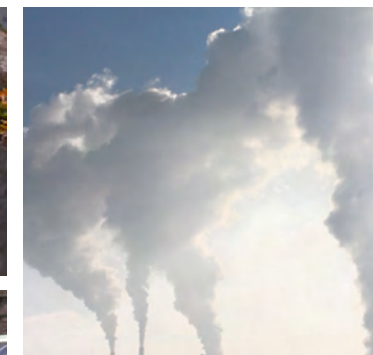
Reducing carbon emissions in line with the 'Race to Zero'.

The Government is asking all businesses to sign up to the 'Race to Zero'. This requires all business activities to get to net zero by 2050 with substantial progress by 2030 and determines the goal for wider corporate activities. The Future Homes secretariat is in touch with the Race to Zero with a view to becoming a formal partner of the Race to Zero.

Establishing wider sustainability goals. An early activity will be to determine what other goals to cover for example water efficiency and resource efficiency in line with national targets might be appropriate to facilitate a consistent planned approach across the sector. The plan should see substantive progress by 2025.



Crest Nicholson Monksmoor Park, Northamptonshire



Explaining the roadmap

Goal specific enabling steps. Here are some of the central challenges for each of the goals and the enabling steps the Hub will need to help with.

Themes	Challenges	Enabling steps
Sharing innovation.	Efficient scale up of the best emerging innovations.	Consider how to create the right forum for sharing best emerging practices and the mechanisms for scaling them up.
Making commitments.	The role for major developers to adopt a leadership position.	Consider where major developers can make joint commitments to take action that can then change the market for the rest, for example on plastic packaging.
Expand supply chains for low embodied energy products.	The scale of supply needed may not be available quickly enough.	Work with the supply chain to communicate needs early and identify gaps in Environmental Product Declarations. Support SMEs in selecting materials and products.
Reporting.	The risk that lots of new reporting requirements will become over complicated and a distraction from substantive action.	Establish how reporting can be as simple and effective as possible.

SECTION 3: implementation and the delivery hub

Approach to sector-wide delivery



Building confidence in shared delivery.

Section 3 sets out the emerging implementation arrangements to ensure the plan is genuinely sector-wide, brings together the 'supply chain' of partners required to enable delivery, gives everyone confidence in delivery and is managed under a robust governance framework.

Environmental challenges will need to be met across developments of all sizes, house types and new build sectors so the plan needs to be adjusted to reflect the operational reality of homebuilding across the sector.

Key elements of the implementation approach are to:

- give confidence in the plan under robust governance



COMPACT AND COLLABORATION WITH GOVERNMENT

- learn and innovate collectively across the sector and collaborate with enabling partners



DELIVERY HUB

- track progress and facilitate a common accountability framework across the sector



METRICS AND MONITORING

The approach to **inclusivity, customer centricity** and **connecting support initiatives** are also set out below.

Emerging thinking on the role and structure of the delivery hub



SECTION 3

The aim of the delivery hub

The aim of the delivery hub is to oversee implementation of the roadmap, facilitating the collaboration needed to secure effective, efficient and coherent delivery of environmental goals across the sector.

No central body can be directly responsible for delivery. Individual firms need to be responsible for meeting standards and other commitments.

However, the Hub can greatly help scale up innovation and facilitate and de-risk delivery.



Core functions of the delivery hub

The core functions of the Hub on a sector-wide basis will be to:

- **take active overall ownership of the roadmap** on behalf of all stakeholders
- **develop a consistent sector-wide set of metrics** also developing shared protocols for performance, monitoring against those metrics and targets and reporting on progress to all stakeholders
- **identify delivery challenges** researching, analysing and framing delivery challenges in order to bring them to stakeholder and wider attention where necessary
- **identify the technical and operational solutions** that can best and most practically meet

the standards and goals, pooling technical capacity

- **co-ordinate pilot developments** to demonstrate how standards can be met and share learnings across the sector
- **collaborate with co-dependent sectors to help the system move together** (e.g. supply chains, trainers, infrastructure and finance) identifying needs early and create confidence to invest in the means to meet them. The largest companies do this already, but the Hub will work strategically to with partners to serve the whole sector
- **develop templates and guidance** available to all, designed for the smallest developers
- **build capacity across the sector**, through targeted outreach across the sector, designed for the smallest first

- **identify, and work with government and others to overcome barriers**

How the Hub will operate

The Hub will be a small central team that:

- brings together the **right people**
- defines what are the **right questions**
- delivers the **right answers**
- does these all at the **right time**

The [diagram on page 57](#) emerging thinking of the structure of the delivery hub. This has been developed initially around the accelerator programme to support the Future Homes Standard, but designed in a way to expand and incorporate the roadmap as a whole.

SECTION 3

Industry leadership to deliver on environmental goals

Fundamental to success is that the Hub achieves strong buy-in from both:

- **the development industry** so that the sector feels ownership and leadership of the environmental goals and sees the Hub as the place for collaborating on delivery
- **co-dependent** sectors so the Hub becomes a safe space for working collaboratively towards shared solutions

The approach to inclusivity is expanded on below.

How the Hub will be governed

At the same time, to retain trust and credibility, especially as circumstances evolve and change over the next years, the roadmap and delivery hub must be subject to robust and independent governance.

Early thinking is that this should consist of:

- **an executive board to oversee delivery of the roadmap and the Hub's work programme.** This would have an appropriate make up with representatives of government, larger and smaller developers, co-dependent sectors, the conservation sector, local government and the consumer voice. Board representatives would be expected to consult widely to feed in a wide range of views
- **an industry steering group.** This group will review progress strategically across the whole roadmap, the priorities for delivery and what steps are needed to stay on track against the goals
- **a small business steering group.** The objective would be to ensure the Hub's activities are consistently designed to serve the needs of the range of smaller developers. The steering group would feed in through a small business member of the board
- **an ongoing role for the Task Force.** The Task Force set up to

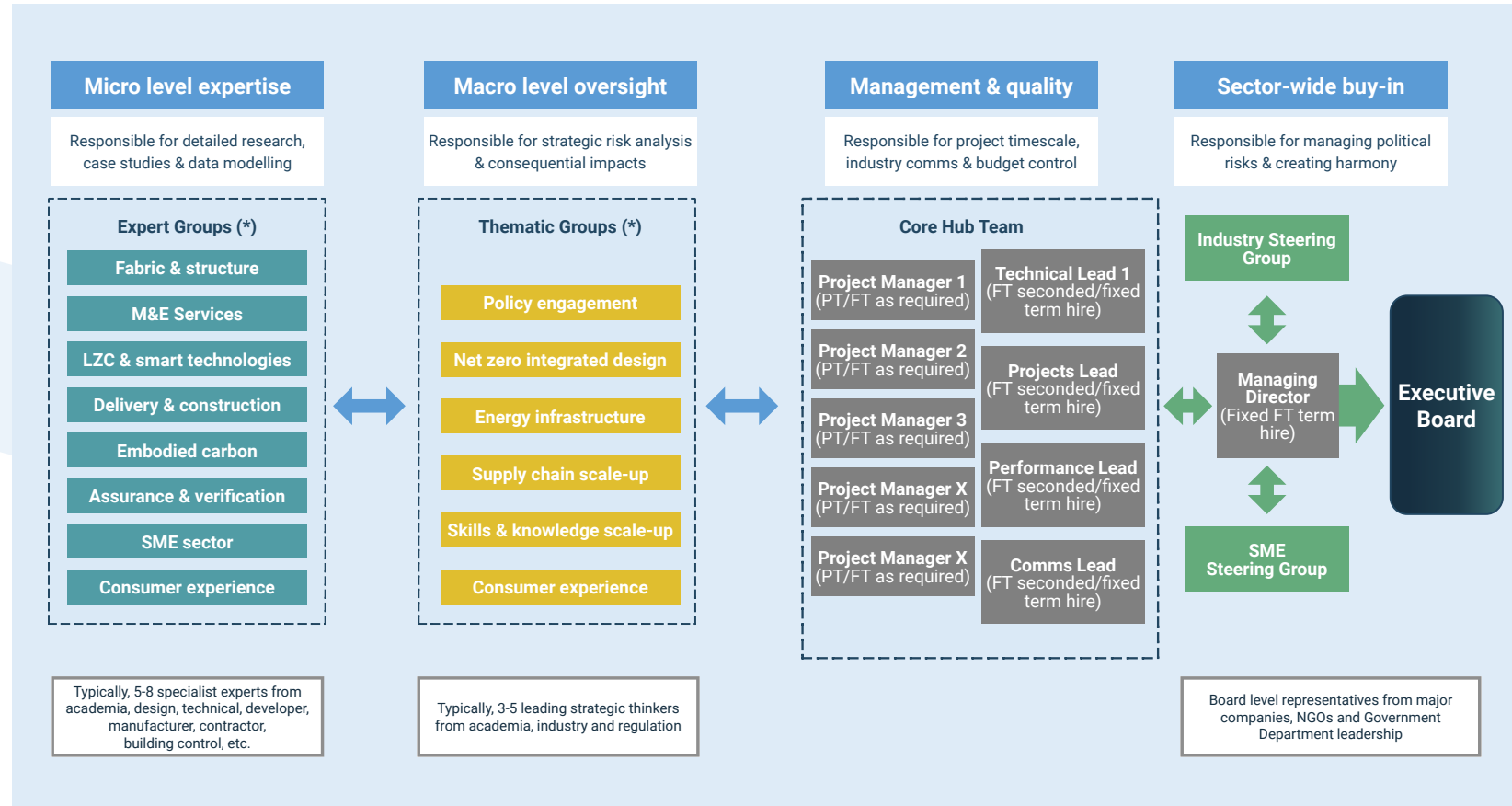
oversee this initial phase of work should continue to achieve a wide and shared sense of ownership of implementation. It should meet regularly, perhaps quarterly. Outside that the board should consult the Task Force at any point it wants to agree changes to the goals

- **a transparent and sustainable funding model.** A sustainable funding model is essential to being able to plan and target the most important activities.

The Hub should be jointly funded by industry (to achieve industry ownership) and government (to achieve credibility within the industry and beyond and to ensure the Hub covers the whole sector).



Creating an effective delivery body



The expert and thematic groups are illustrative based on those required to support delivery of the Future Homes Standard. The structure will be reviewed to address all domains of the roadmap.

Hub lifecycle

The Hub will be time-bound, established initially for a 5-year term to carry out the programme of enabling activities detailed for the next five years to oversee and facilitate delivery of the goals.

The Hub could continue for a further term, subject to identification of the next phase of work needed to implement goals and agreement that the Hub is the right vehicle.

Metrics and monitoring



SECTION 3

Not all the goals in the roadmap are underpinned by robust metrics. A meaningful set of metrics that can be consistently applied will be fundamental to driving sector-wide performance against the commitments in this plan and national targets including under the Environment Bill. The metrics will facilitate both the setting of targets, but also enable recognition of those who want to go further and faster.

Currently the landscape of performance metrics is fragmented and untransparent. For example, there are currently several different metrics systems for environmental social and corporate governance (ESG) and a number of different sets of performance and standards frameworks.



An early priority for the Hub will therefore be to:

translate the goals into a sector-wide set of performance metrics.

Metrics should be developed through a robust process of evaluation and the Hub should work with for example the Construction Leadership Council's CO2tructzero plan, Next Gen, the UKGBC and RIBA, to develop a common set of metrics. Metrics that reflect absolute performance rather than performance relative to the status quo are more likely to capture the art of the possible and be fairer to those who are already meeting high standards.

develop monitoring methods for the metrics.

Monitoring should be sufficiently simple and user-friendly to be applied sector-wide. Metrics, monitoring and information sharing should be designed to meet the needs of information users (such as customers, the finance community and government), navigating privacy and commercial confidentiality.

PropTech companies also have a role to create robust and flexible systems for data, performance evaluation and continuous learning.

oversee progress towards implementing the standards and commitments.

Regularly reporting to government through the board will help achieve a continuous feedback loop.

Small businesses and inclusivity



SECTION 3

The Hub should, as far as possible, cater for all developers of all new homes.

Designing the Hub to meet the needs of small businesses.

Smaller developers, from micro-businesses building one or two homes upwards will be a particular focus given the complexity of the challenges. These businesses generally have less access to the technical and operational capacity needed to understand and manage change; and this could lead to more closing.

At the same time it is important to recognise that many smaller developers are at the cutting edge of sustainable home building and their experience and expertise will be valuable to the Hub.

To ensure the Hub is designed to meet small developer needs, a

small developers group will be set up initially to inform the design of the Hub and its programmes of work, and subject to its recommendations, a standing small developers group will help steer the activities of the Hub. This small developer group (or groups) will include representation from relevant trade associations such as the Federation of Master Builders, the National Federation of Builders and the Home Builders Federation's small developer group.

It will also seek to represent the breadth of developers who aren't representation by any trade association.

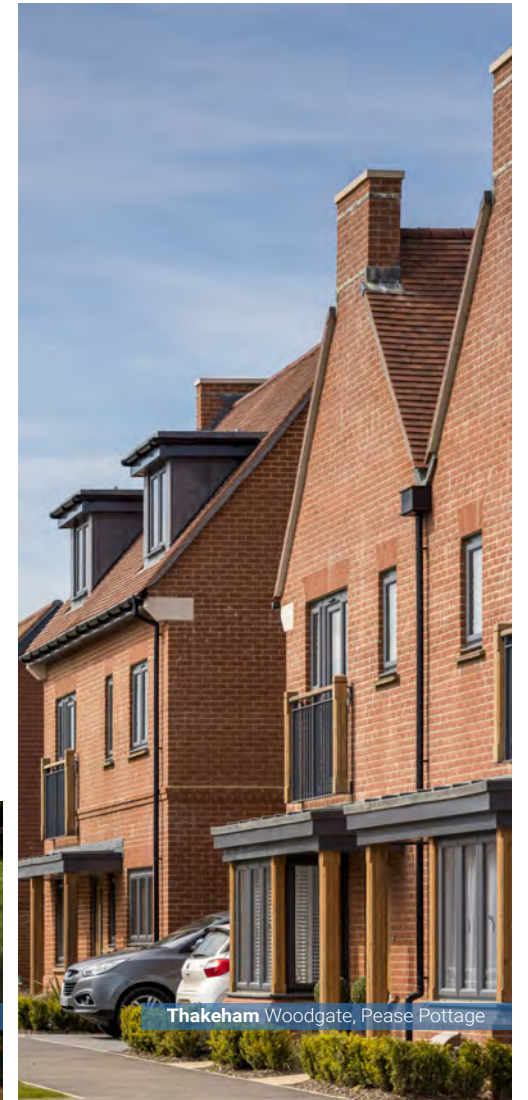


Thakeham Woodgate, Pease Pottage

Including developers and home typologies.

More broadly, within available resources, the Hub will seek to work closely with and meet the needs of the:

- **social sector and housing associations.** For example, with engagement through the G15 group of housing associations and the National Housing Federation
- **private rented sector.** For example, with engagement through the British Property Federation.



Thakeham Woodgate, Pease Pottage

Putting customers at the heart of delivery



SECTION 3

Throughout the task force process, a priority has been to recognise that home building is a customer facing activity and that successful change must therefore put the customer at the centre.

The Hub will need consistently to consider three dimensions:

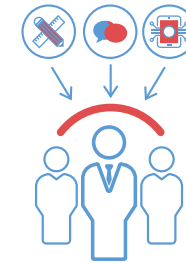
- **Designing solutions with the customer in mind** – ensuring that change and innovation is mindful of customer lifestyle requirements, where possible looking for opportunities to improve experience. Testing innovations with customers for both performance and experience both in prototype situations and through post occupancy evaluation, is therefore critical
- **Communicating the customer benefits of sustainable homes** – perceptions are slow to change especially in making decisions as important as what home to buy. Therefore, as the whole new

homes sector moves to new designs and technologies, there is an opportunity for sector-wide mandate to understand consumer perceptions and buying behaviour and influence them positively to drive take-up and sales of homes built to high sustainability standards

- **Support for using new technologies** – new technologies such as heat pumps function in a very different way from say gas boilers. While consumers generally welcome home technology, it must make their lives better not more complicated and remain affordable

Some technologies such as heat pumps, smart metering and mechanical ventilation heat recovery systems may be unfamiliar and there are interactions between technologies that will need to be managed to achieve the best experience and

energy, carbon and cost efficiency. Support for users in communication that is easy for the consumer to use such as in-house manuals can therefore be developed on an industry-wide basis.



Connecting support initiatives and organisations



SECTION 3

The problem of fragmentation.

Meeting the set of challenges sector-wide will require everyone to work in concert. Through the work of the Task Force we heard of many brilliant initiatives, but overall there was a strong and widely held view that the landscape of support initiatives was fragmented and less effective than it could be, including between national and local levels.

Initiatives should be better connected, build on each other, with greater awareness of who is best placed to do what and greater coherence overall. Unless different approaches are warranted by different operational circumstances, there should ideally be a single or at least consistent approach.

The Hub will not 'do' everything, but will look to connect, collaborate with and work through existing organisations wherever possible to achieve its aims.

Alignment of sustainability plans.

For the first time, the Future Homes roadmap provides a single, sector-wide plan for the whole new homes sector. This is potentially a powerful and effective approach provided it endures. It will be important therefore to connect, and achieve consistency between, this plan and any wider plans rather than to duplicate. Work is therefore underway to connect:

- **Construction Leadership Council's CO2nstructzero plan.** The Future Homes plan will be the new homes element of the wider CLC plan with opportunities for example to collaborate where more efficient to adopt a 'whole construction' approach or to connect with supply chains
- **UK Green Building Council's Whole Life Carbon Roadmap.** Similarly, the Future Homes plan will be the new homes element of the WLCR, with analysis done on a built

environment basis with potential to inform elements of the Future Homes plan

- **Race to zero.** The Future Homes Delivery Hub is working with the Race to Zero team to become a partner. Therefore, by meeting the Future Homes plan, developers are automatically eligible for the Race to Zero. The Future Homes Task



Force secretariat is working with the Race to Zero team to become a partner.

Connecting and collaborating with support initiatives.

To be able to connect and work with existing organisations, the Future Homes Task Force team is currently mapping the ecosystem of initiatives and who's doing what against the questions that need to be answered and activities that need to be done.

The list of organisations and initiatives includes, but is not limited to the following:

- **Sustainable buildings initiatives** UK Green Building Council (UKGBC), Construction Leadership Council's Green Construction Board, London Energy Transition Initiative, Passivhaus Trus, Good Homes Alliance, Better Buildings Partnership, Construction Innovation Hub.
- **Professional bodies** Chartered Institution of Building Services Engineers (CIBSE), Chartered Institute of Housing (CIH), Chartered Institute of Plumbing and Heating Engineering (CIPHE), Construction Industry Research and Information Association (CIRIA), IEMA (Institute of Environmental Management and Assessment, Royal Institute of British Architects (RIBA), Royal Institute of Chartered Surveyors (RICS), Royal Town Planning Institute (RTPI).

Connecting support initiatives and organisations



SECTION 3

Homes England.

As the Government's housing accelerator with the 'appetite, influence, expertise and resources to drive positive market change', there is a big opportunity for partnership with the Hub to scale and accelerate developments that meet the Future Homes Task Force goals.

Office for Place.

The Office for Place will also be an important partner. There is scope to work together to build capacity simultaneously within the local planning authority and developer communities, as well as to help create shared expectations on how to achieve good design. The Hub could also play a role in incorporating sustainability within design codes.

More widely, there are many synergies between the design, beauty and sustainability agendas for example, in terms of designing for walkability, vibrant local community and nature.

There are also some potential tensions to manage; for example, between materials and build forms that reflect local vernacular and that achieve low embodied carbon and/or high energy efficiency standards.

Modern Methods of Construction Taskforce.

The recently announced MMC Taskforce's focus on accelerating home building through the increased use of modern methods clearly links closely to the innovation needs driven by the Future Homes Standard.

We envisage a close working relationship given the requirement for all strategic partnership grant programme developments to deliver at least 25% of homes using MMC in the coming years.

Strategic alignment of the 'delivery chain'



SECTION 3

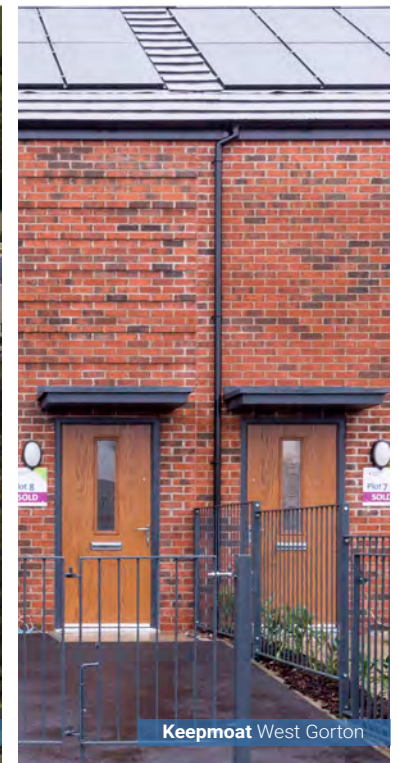
Meeting the goals and commitments effectively, coherently, efficiently, within the timeframes set and while managing potential risks depends on all those who play a part in the delivery chain facing in the same direction and working in a mutually supportive way.

This section shares emerging views on how that alignment can be achieved.

Finance by the Green Finance Institute

The finance sector has an important role to play in developing the financing models that can deliver the necessary investment at pace and at scale.

The table below provides further information on these practical applications of the Task Force recommendations.





	A consistent suite of sustainability performance targets for new homes	A 'golden source' for data on new homes
Overview	Sustainability linked loans offer a valuable tool to drive engagement and incentivise positive environmental behaviours in the real estate sector. The taskforce's roadmap provides a consistent, industry-backed suite of sustainability performance targets (STPs) for the home building sector, which could reduce the risk of greenwashing and increase confidence in the ambitiousness of STPs amongst lenders, investors and other key stakeholders.	Access to high-quality, trusted data can support financial institutions in monitoring, assessing and reporting on the environmental impact of their lending decisions and loan portfolios. The taskforce's delivery hub could be structured to act as a 'golden source' for environmental and social data on the home building sector, which could support the disclosure and reporting activities of financial institutions and other stakeholders.
Benefits and opportunities	• Offers an industry benchmark for STPs in the home building sector, therefore helping to establish consistency, transparency and integrity into construction-related sustainability linked finance • Reduces the time and resource needed to validate the ambitiousness of STPs within banks, thereby accelerating transaction times and potentially helping lenders extend sustainability linked loans to smaller home builders • Supports uptake of sustainability linked finance across all sizes of home builder, thus providing an attractive financial solution to help bring the 'investment gap' in developing high-quality and sustainable homes	• Provides a centralised database of trusted information on the home building sector, which can enable accurate assessment of ESG-related risks and consistent reporting across the finance sector • Offers easy access to the data needed to establish sustainability league tables, which could encourage a 'race to the top' among home builders • Supports other tools designed to facilitate the decarbonisation of buildings, for example the data could inform Building Renovation Passports^[2]
Considerations	• Continued dialogue with experts and stakeholders, including second-party opinion and third-party verification providers from reputable sustainability consultancies, to ensure that as further detailed STPs are developed they are sufficiently ambitious, yet realistic to increase confidence in the taskforce's roadmap amongst lenders and investors. • Early engagement with the finance sector and alignment with regulatory developments in the sustainable finance landscape (e.g. mandatory TCFD reporting^[3], disclosure and targets on the energy efficiency of mortgage portfolios^[4]) can boost awareness and adoption of the roadmap by financiers	• Compliance with GDPR is an important consideration, in particular if the 'golden source' includes social information that could be attributed to an individual. • A robust governance system will be required to ensure that data is collected to a high standard, stored in compliance with relevant regulations, and data access is controlled by suitable protocols • Cross-sector engagement can ensure the delivery hub captures decision-useful information that is relevant to key stakeholders.

[1] <https://uk.ramboll.com/sustainability/solutions/embodied-carbon>

[2] <https://www.greenfinanceinstitute.co.uk/wp-content/uploads/2021/03/GREEN-FINANCE-BUILDING-RENOVATION-final.pdf>

[3] <https://www.gov.uk/government/publications/uk-joint-regulator-and-government-tcfd-taskforce-interim-report-and-roadmap>

[4] <https://www.gov.uk/government/consultations/improving-home-energy-performance-through-lenders>

Green finance will be a core theme for the Hub, including working with all those who significantly influence how development is financed and valued.



As presented earlier, this sector-wide transition to net zero sustainable communities will require fundamentally different approaches to the way in which developments are strategically planned and delivered. Close and continual collaboration with Local Government and planners will be more critical if the full benefits are to be realised for both the existing local community and new residents.

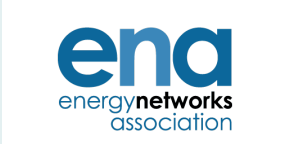
There is a strong role for the Hub to work with the local authority community on a strategic approach to piloting early adopters while encouraging the consistency of standards required to achieve scale across the country as quickly as possible.

Key issue	A consistent suite of sustainability performance targets for new homes	Important enablers and partners
Managing local planning requirements Managing innovation and scale up in an often highly varied policy environment	Is there scope for a more coherent and scalable model where Local Authorities can set higher standards but in a way that is consistent with a sector-wide national approach to accelerated rollout of innovation? Can earlier and closer collaboration increase the commercial viability of higher performance levels and leverage wider communal benefits such as public transport network expansion and increased access to green spaces?	  



The move away from gas-based developments from 2025 is arguably one of the most challenging cultural and technical shifts the supply chain has to face. To this can be added the increasing demand for significant reductions in water consumption.

The lead time between land acquisition and construction on site means developers often want to understand and plan their infrastructure strategies several years before construction.

Key issue	Challenges to be addressed with hub team guidance	Important enablers and partners
Transitioning to gas free homes Assessing and selecting the most appropriate technologies and ensuring network capacity is available in regions targeted for development.	Can a map of future regional development plans and existing infrastructure capacity be produced to understand the network challenges due to PV, heat pump and EV grid connections? Could we develop best practice techniques for assessing and managing change from the more advanced/future proof networks?	   

Supply chains



SECTION 3

Innovation at the speed and scale needed to deliver mainstream net zero and sustainable developments, while ensuring building safety requires a carefully planned and coordinated strategy. The Hub team will be ideally placed to ensure the level of collaboration across what is a very diverse supply chain. Central to success will be combining the technical and logistical input of major and smaller developers.

This can then be presented back to the wider supply chain in a coherent set of challenges making R&D investment by manufacturers and suppliers more efficient and less risky.

Key issue	Challenges to be addressed with hub team guidance	Important enablers and partners
Demystifying FHS 2025 Investigating how best to balance fabric, services and LZC generation to achieve robust and commercially viable high performance homes.	Can traditional fabric construction and ventilation techniques deliver the required energy performance or is an industry-wide shift to MMC and whole house mechanical ventilation more viable? Could we develop a consistent range of space heating, hot water, PV and battery 'package specifications' to help focus the efforts of manufacturer R&D programmes?	



Feedback during the Future Homes Task Force initial work has reconfirmed the critical role improving skills and knowledge will play in the next 5 years. There is a huge risk of failure across the industry if we simply believe that design and product innovations will produce robust and desirable net zero and sustainable developments. Conversely, with a proactive approach, there is a massive opportunity for creating new and better jobs as we develop the future homebuilding workforce to deliver on the goals.

Lessons from the previous work of groups such as the NHBC Foundation, Zero Carbon Hub, Good Homes Alliance, CITB and MHCLG themselves, has shown that education, training and future proofed Continuous Professional Development is at the heart of successful innovation. Developing and involving the right skills at key points is equally important to planning for sustainable sites. By strategically coordinating work across the delivery chain the Hub team will be able to ensure skills and training providers form a core part of projects during their delivery, rather than simply being seen as recipients of outputs which may or may not actually meet their needs. This goes with the grain of the Government’s Green Jobs Taskforce and the Hub will need to align with its findings.

Key issue	Challenges to be addressed with hub team guidance	Important enablers and partners
Creating a skilled and informed workforce Designing, trialing and disseminating training material for future homes.	Can we produce a strategic analysis of existing professional and trade educational curriculum to identify gaps for future technical and process needs? Could we collaborate with regional and local training providers during pilot developments to trial new approaches to skills and refine into modules suitable for full accreditation?	

Certification and warranty providers



SECTION 3

Two barriers are often cited during discussions of how innovation can be helped or hampered on its journey to market; lack of suitable certification schemes and fear of the new by the insurance industry. Experience from collaborative projects such as the Innovate UK funded AIMC4 and Welsh Government funded Innovative Housing Programme has shown these barriers can be managed and significantly reduced.

As the strategic lead of innovative pilot projects the Hub team will be able to create a safe space for designers and manufacturers to continually engage with certification and warranty providers, identifying risks and designing solutions without large amounts of abortive work and investment.

Key issue	Challenges to be addressed with hub team guidance	Important enablers and partners
Reducing the risk and accelerating the innovation process Facilitating early risk mapping techniques and developing collaboration forums.	Can we help manufacturers present their innovations in a better way to help others understand the risks and opportunities quicker and more supportively? Could we create innovation forums, linked to the Hub supply chain and pilot development projects, that proactively guide and manage trials and testing to inform future certification and warranty assessment procedures?	

Annexes

ANNEX 1: Task Force method and engagement



The Task Force met three times between September 2020 and March 2021 to establish the method and review emerging findings, drawing on an intensive programme of engagement in between, including

- **Surveys of the home building sector and wider stakeholders.** There were 51 responses from home builders including 8 of the largest 10 by volume. 30 wider stakeholders completed this survey, from many sectors including academia, utilities, NGOs, finance, and landowners. The survey was shared through networks such as the Construction Leadership Council and the Task Force to be open to a wide community. The surveys were focused on gathering base evidence and to inform the appropriate scope and framing of the plan. A summary of results

are at Annex 2. The survey captured amongst other things the current picture of commitments across the sector

- **Post-lockdown summit.** A second summit was held as the work recommenced in September 2020 to revisit the starting assumptions for the work in the context of the pandemic
- **Core group of home builders.** Representatives of four home builders with early commitments on sustainability and an expert from the UK Green Building Council worked with the secretariat as part of an extended team to help develop the proposals and advise on the issues
- **Proposal development workshops.** Workshops were held in each of three domains: the home, planning and site design and infrastructure to

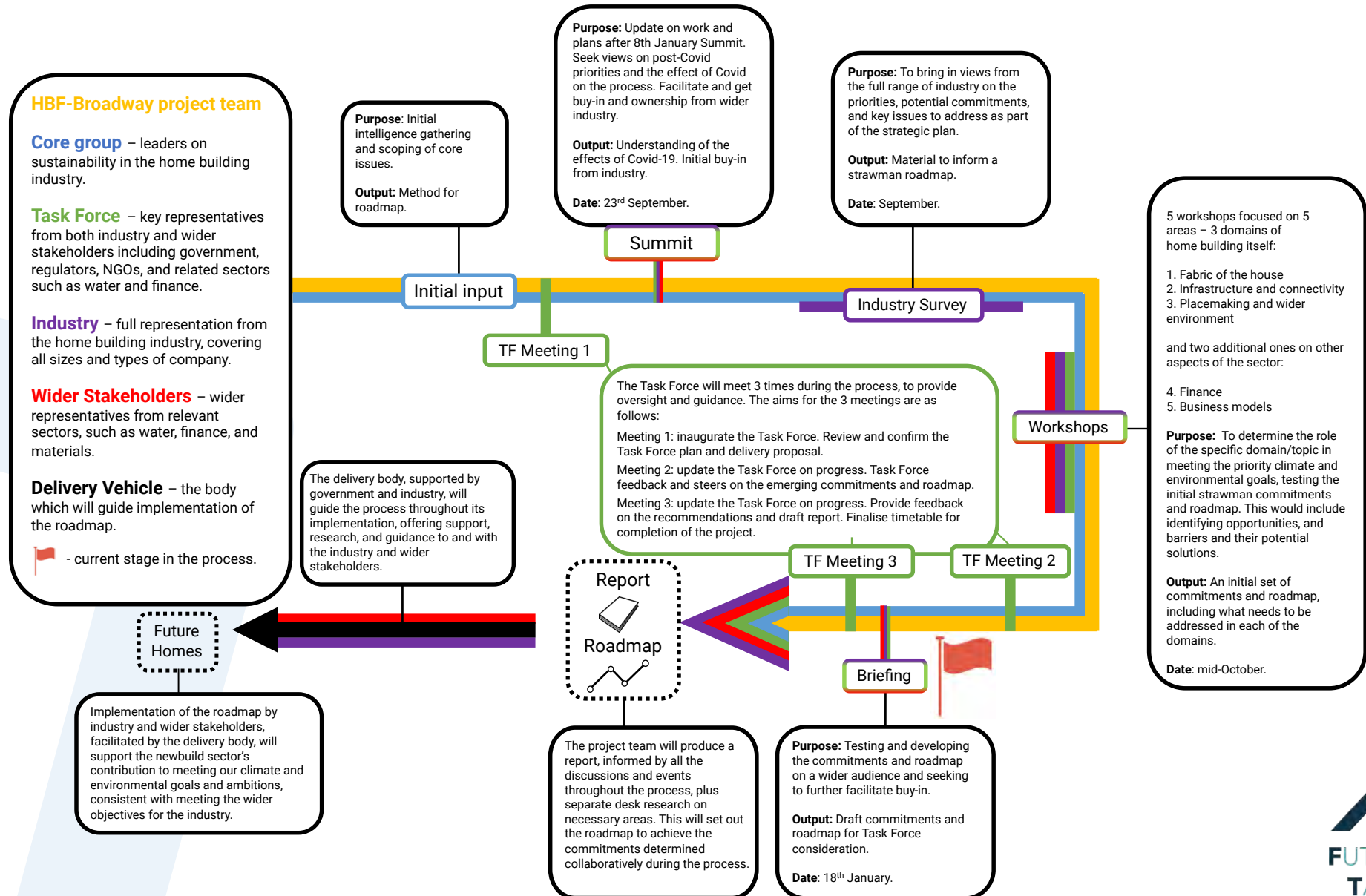
gather ideas for the proposals from experts in each domain, using 'jamboard' an online co-creation tool. These were followed by more in-depth discussions with experts on each of the issues to help develop the proposals. There was also a workshop led by Lord Bob Kerslake to review horizontal issues. The Green Finance Institute also held discussions with the finance community

- **Technical directors' group.** A group of home builder technical directors met several times in the second half of the process to 'road test' proposals from a technical and operational perspective
- **Briefings on emerging proposals with home builder and other communities.** A series of briefings were held to get feedback on emerging proposals. This included two

sessions with Construction were Consultations with home builder groups representing different parts of/CLC

- **Open briefings.** Briefings were held with a number of groups to get feedback on emerging proposals. The groups included the Construction Leadership Council housing group, Home Builders Federation developer groups (majors, midcaps, metropole and small), the HBF spring update, Federation of Master Builders members, G15 housing association group members, UK Green Building Council members, environmental NGOs and a wider briefing with over 100 delegates. An open zoom drop-in session was held for anyone wanting to discuss proposals in more depth.

The FTHF process



ANNEX 2: Results of the industry

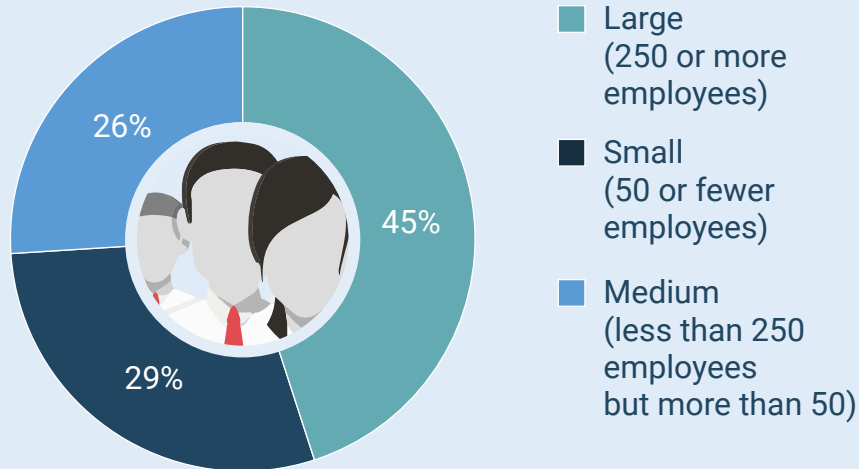


A total of 51 home builders completed the industry survey, from across the size range, including 8 of the top 10 by annual volume, which together constitute approximately one third of the industry's output.

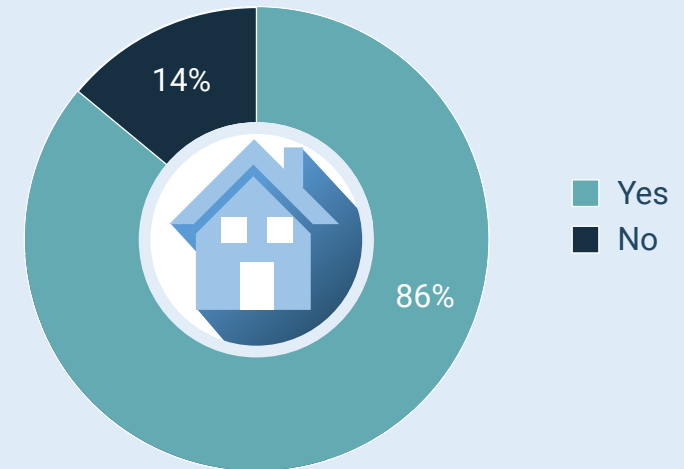


The home builders overwhelmingly supported the proposed scope of the roadmap across the seven areas (Net Zero, Resilience, Placemaking, Biodiversity, Air Quality, Water and Resource Efficiency); those who selected “no” generally sought to highlight an area of particular focus, or to introduce a new area which was not included in the original scope, but which could typically be incorporated under one of the areas.

What is the size of your company?



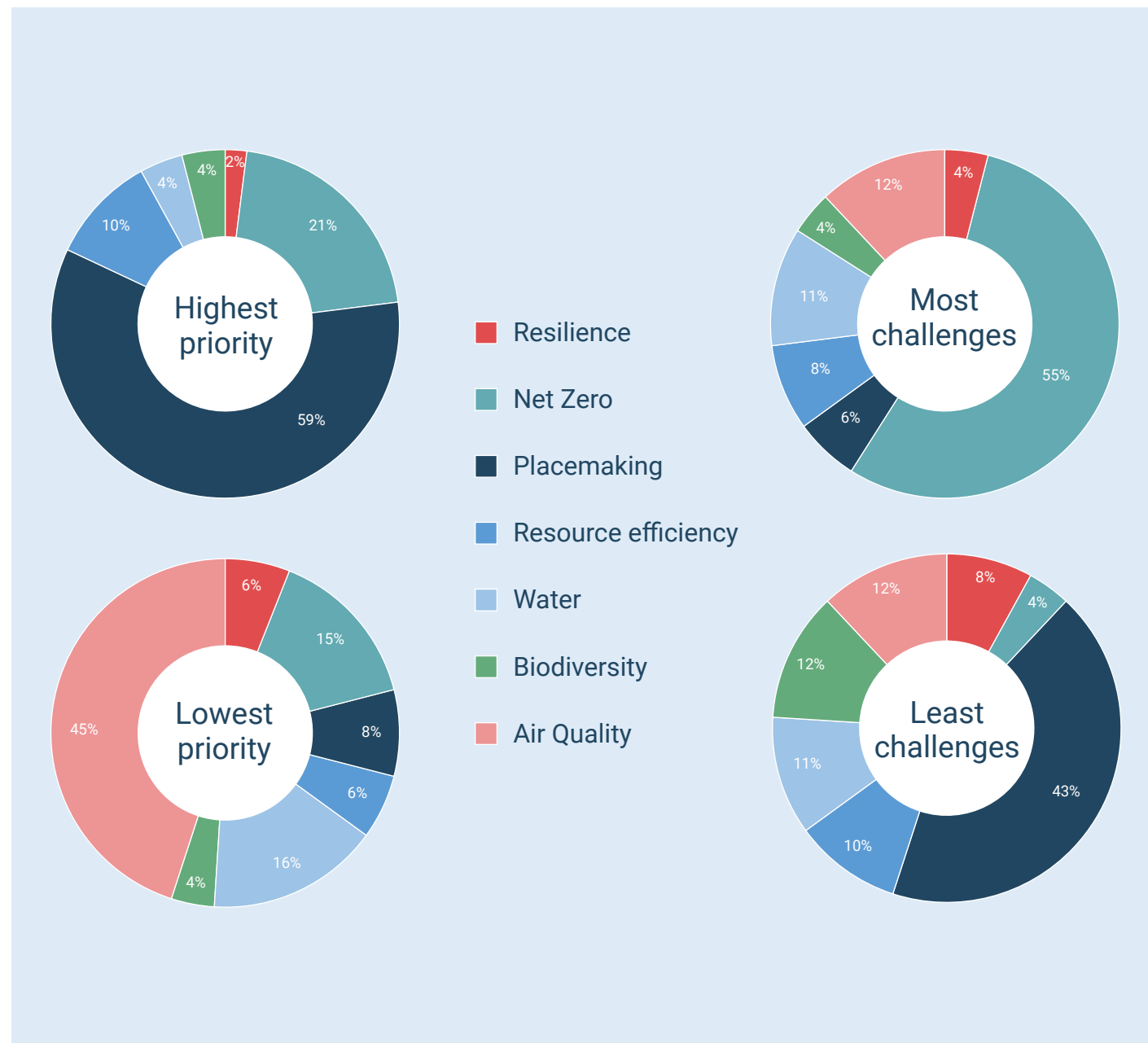
Cover right area? (home builders)



When asked to rank the seven environmental areas according to priority and level of challenge, home builders most frequently ranked **Placemaking** as most important, with the least challenges – an interesting result, perhaps reflecting the importance, but also vagueness or intangibility of the topic.

Net Zero featured as the second most common top priority, and by far the most common top challenge, reflecting both its importance and the difficulties of implementing solutions to its challenges.

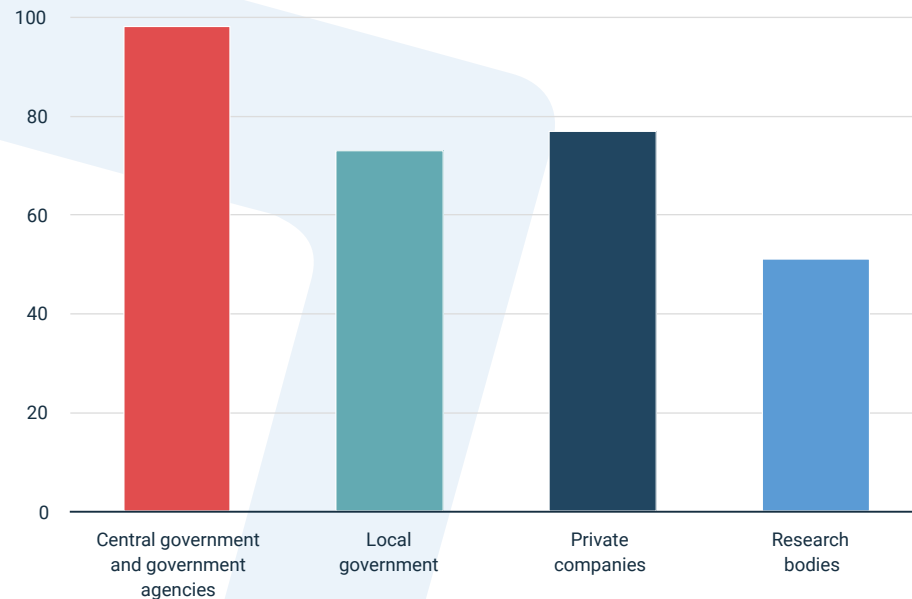
None of the home builders selected **Air Quality** as the highest priority, perhaps as this is perceived as an area which the industry has relatively little control over.



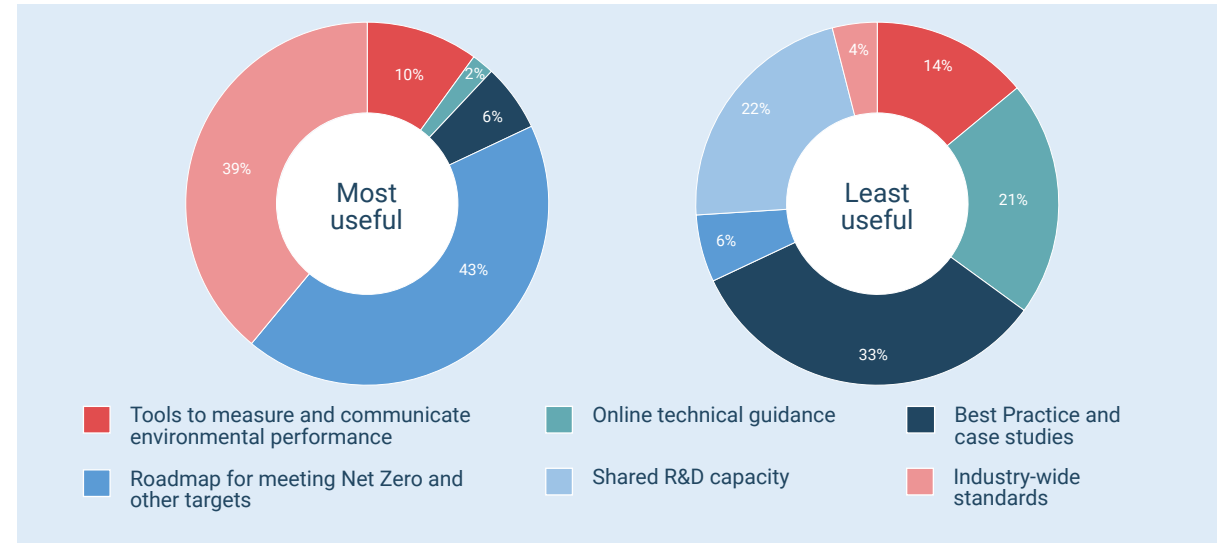
When asked whose responsibility it is to drive progress in the environmental areas, nearly all respondents selected central government, with just under 80% including private companies.

Each of the four given options were selected as having responsibility by the majority of home builders, emphasising the shared responsibility and need for coordination between them to drive change.

Whose responsibility is it to drive progress?



The home builder survey asked respondents to rank six enabling activities, to determine what the industry considered most useful to support action in the environmental areas.



The most common type of support recognised as most useful was a roadmap for meeting various environmental targets, confirming that a coordinated, widely agreed roadmap is a key method for aiding industry in achieving environmental goals. Closely second was industry-wide standards, emphasising the need for standards to drive change by providing a level playing field – as highlighted by the high level of responsibility assigned to central government in the above question. Few respondents selected a roadmap or standards as the least useful; this was shared between best practice, online guidance, and shared R&D capacity.

In addition to the questions highlighted above, very useful information was ascertained through the survey on existing and potential company-level commitments, and potential sector-wide targets, as well as thoughts on the barriers to action in each area. All this information was factored into the thinking behind the roadmap, with particular care taken to consider how to address the barriers identified by respondents.

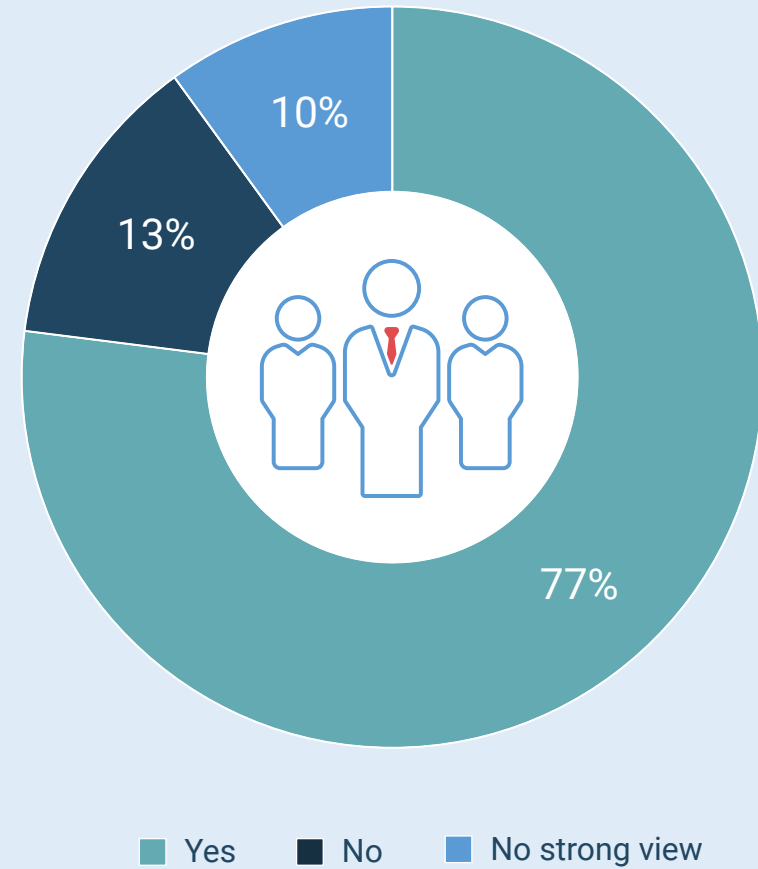
Results of the wider stakeholder survey



30 wider stakeholders completed this survey, from many sectors including academia, utilities, NGOs, finance, and landowners.

Similarly, to the home builders, the wider stakeholders largely supported the proposed scope as defined by the seven environmental areas (Net zero, Resilience, Placemaking, Biodiversity, Air quality, Water, and Resource efficiency); “No” responses typically went on to highlight specific aspects of an area covered by their organisation’s activities.

Cover right area? (Wider stakeholders)



References



A Green Future: Our 25 Year Plan to Improve the Environment.

Department for Environment Food and Rural Affairs. January 2020.

A housing design audit for England.

Place Alliance. 2020.

A place for SuDS: Assessing the effectiveness of delivering multi-functional sustainable drainage. CIWEM. February 2017.

A smarter approach to infrastructure planning.

RTPI. May 2019.

Blueprint for an Environment Act.

Broadway Initiative. November 2018.

Bricks and water.

Building resilience for England's homes. Policy Connect. October 2020.

Bringing Embodied Carbon Upfront.

World Green Building Council. September 2019.

Building for a Healthy Life.

A Design Toolkit for neighbourhoods, streets, homes and public spaces Design for Homes. June 2020.

Buildings Mission 2030.

Background report to recommendations from the Green Construction Board in response to the 2030 Buildings Mission. Construction Leadership Council, Green Construction Board. April 2019.

Clean Air Strategy.

Department for Environment Food and Rural Affairs. January 2020.

Climate Change Risk Assessment 3.

Climate Change Committee. June 2021

Climate Emergency Design Guide.

LETI. January 2020.

Closing the gap between design and as built performance.

End of term report. Zero Carbon Hub. July 2014.

Code for Sustainable Homes Simply Explained.

NHBC Foundation. June 2009.

Delivering net zero: A roadmap for the role of heatpumps.

Heat Pump Association. 2019.

Embodied and whole life carbon assessments for architects.

RIBA. December 2019.

Embodied carbon primer.

LETI. January 2020.

Enabling healthy placemaking.

RTPI. July 2020.

Environment Bill 2020.

Department for Environment, Food and Rural Affairs. January 2020.

Framework for defining social value.

UK Green Building Council. February 2021.

Future Homes Standard: changes to Part L and Part F of the Building Regulations for new dwellings. January 2021.

Future for Home Heating – life without fossil fuels.

September 2020.

Home comforts during the Covid-19 lockdown.

Place Alliance. October 2020.

Homes for people and wildlife.

How to build housing in a nature friendly way. The Wildlife Trusts. January 2018.

Improving home energy performance through lenders.

Department for Business, Energy and Industrial Strategy. November 2020.

Living with Beauty.

Report of the Building Better Building Beautiful Commission. January 2020.

National Design Guide.

Ministry of Homes, Communities and Local Government. January 2021.

National Model Design Code.

Ministry of Homes, Communities and Local Government. January 2021.

Net Zero – The Road to Low Carbon Heat.

CBI. July 2020.

Net Zero – Technical Report.

Climate Change Committee. May 2019.

Net Zero transport.

RTPI. The role of spatial planning and place-based solutions. January 2021.

Plain England Guide to Sustainable Construction.

Constructing Excellence. January 2008.

Planning for a smart energy future.

RTPI. July 2019.

Planning naturally. Spatial planning with nature in mind: in the UK and beyond.

RSPB. July 2013.

Putting health into place.

NHS England. September 2019.

Raynesford Review of Planning.

TCPA. November 2018.

Resources and Waste Strategy for England.

Department for Environment Food and Rural Affairs. December 2018.

RIBA 2030 Climate Challenge.

RIBA. 2019.

Sixth Carbon Budget advice reports.

Climate Change Committee. December 2020.

State of Natural Capital Annual Report.

Natural Capital Committee. 2020.

Sustainable drainage systems: non-statutory technical standards. Department for Environment, Food and Rural Affairs. 2015.

SuDS Manual. CIRIA. December 2015

Water quality. House of Commons Library. Sara Priestley. July 2018.

UK housing: Fit for the Future. Climate Change Committee. February 2019.

Whole life carbon assessment for the built environment. RICS. November 2017.

While life carbon vision. World Green Building Council. 2021.

Zero Avoidable Waste in Construction. What do we mean by it and how best to interpret it. A recommendation from the Green Construction Board. February 2020

Zero Carbon Homes. House of Commons Library. Elena Ares. April 2016.