



West Midlands
Combined Authority

Homes for the Future

Our Proposals for
Aligning Zero Carbon
Homes and Advanced
Manufacturing

Cast 

usefulprojects

8th December 2023

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Foreword by Andy Street



Our Proposed Homes for the Future Strategy brings together two distinct elements: our clear ambition for building zero carbon homes and the region’s proven capabilities in advanced manufacturing.

Using the latest digital technologies and innovations in construction, we aim to build more energy efficient, warmer, healthier, sustainable homes while creating brand new business, investment, and job opportunities.

We are determined to tackle the region’s declared climate emergency and meet our commitment to be carbon neutral by 2041. With Homes for the Future, we have the opportunity to drive an increased supply of new homes, support existing businesses and create new ones, develop skills and improve the quality of new homes. By ensuring that our green ambition is embedded into all new construction projects from the start, we will be making our new homes liveable, sustainable, and resilient to the climate crisis.

This is a journey... a journey to ensure that the transition to zero carbon, climate resilient construction is achievable and accessible across the construction industry. This is a journey with our Future Homes Taskforce, key stakeholders, developers, housing associations, and boards, as well as our communities. I invite you to work with us and I promise that we will be there to support you every step of the way.

There are huge advantages for us all.

Andy Street

Andy Street
Mayor of the West Midlands

Executive Summary

Nationally, the Government has set out a clear plan for challenging the construction industry to embrace the building of energy efficient, resilient, zero carbon homes through planned changes to Building Regulations in 2025 (the Government's 'Future Homes Standard'). The Government is also incentivising new building techniques through requirements set out in major funding programmes such as the Affordable Homes Programme, now run in the West Midlands by WMCA and Homes England following the 2023 Devolution Deal.

As a result, many of the largest housebuilders and investors in the UK construction industry are implementing radical change to their models of building, incorporating advanced manufacturing techniques to drive efficiency, productivity and quality. But we need to ensure that this advantage is spread across all businesses, large and small.

In the West Midlands, we aim to get ahead of the curve in zero carbon and changes in regulations. The construction industry has one of the highest economic multipliers of all industrial sectors – nearly £3 value add for every £1 spent – and the opportunity for this strategy is to leverage these changes to ensure a 'fit for purpose' housebuilding industry in the West Midlands and a resilient supply chain that can weather the challenges that the housebuilding sector is facing.





Homes for the Future fundamental principles:

- 1 Aligning with emerging industry standards:**

We have sought to align the strategy with what is already happening in the region and beyond on development projects, leading industry standards such as LETI (the Low Energy Transformation Initiative) and existing standard outcome metrics such as Pre-Manufactured Value (PMV). The PMV targets have been set in line with those of Homes England. Collectively, this will provide confidence to investors and developers (and Government) on clarity, certainty, case study evidence and delivery momentum.
- 2 Signalling a long-term ambition and direction:**

The strategy and supporting Technical Standard set a clear, long-term ambition over the period to 2030, with incremental increases in requirements, enabling the construction industry to respond and invest over time, and as its capacity develops.
- 3 Securing pace and momentum:**

Building on feedback from internal and external stakeholders, and key initiatives such as our Climate Emergency, Deeper Devolution Deal and Plan for Growth, the strategy sets a trajectory that exceeds Government regulation in both scope and speed of implementation.
- 4 Enabling realistic, flexible implementation:**

Our strategy requires no one, single, technical solution. We emphasise a phased approach and compliance focused on the outcome rather than the process, allowing the sector to innovate. We also recognise the need to encourage behavioural change where we recognise that enhanced practical performance is not possible in the early years.
- 5 Suggesting practical solutions:**

Delivery is critical, so we recognise the need to be practical. The Technical Standard sets out our expectations for performance over various timeframes. It also includes guidance on how the standard can be achieved in practice.
- 6 Identifying clear evidence of successful delivery:**

To build momentum and show that it can be done, we will build a catalogue of successful projects that showcase success, and share the technical solutions used to create an environment of continuous improvement.

Executive Summary Continued

In terms of implementation, the strategy is also supported by the full policy and investment infrastructure of WMCA's new devolution settlement.

The strategy builds on its pioneering heritage by moving ahead of national Building Regulatory changes. At the same time, a phased incremental approach provides certainty and clarity to industry partners, with a planned transition over time ensuring that there is no negative impact on viability or deliverability. Finally, a performance-based approach adopted in the strategy, rather than a method or material prescriptive approach, will ensure that we are as inclusive as possible to all supply chains.

We have carefully aligned our standard through industry engagement, led by our Future Homes Taskforce, and drawing upon our existing Zero Carbon Homes Routemap to Net Zero Homes. We recognise that, initially, the standard will require higher upfront investment, potentially some £10-£15k per dwelling. We are confident, however, that, as capability builds, national policy changes, economies of scale emerge in the use of new technologies, and the systemic shortfalls in labour and skills drive increases in traditional construction costs, the initial cost increase of the region's technical standard will reduce, potentially to zero, by 2030.

The key to success is consistency and visibility of demand. This includes both the overall long-term quantum of homes to be commissioned, and the type of homes and technical solutions that will be required. This aggregated and standardised requirement, supported by our own interventions, will enable industry to invest, drive up the quality of new homes, drive down their environmental impact, and thereby create a UK-leading manufacturing industry.

Through our engagement with developers, investors, suppliers and other stakeholders, we are confident that this is a move that industry is starting to make already. There is a clear opportunity for the West Midlands to take a leadership position, demonstrating that change is not just possible but necessary. Through this strategy, WMCA is embracing its role as a facilitator and leader to shift the needle on this agenda, maximise the opportunities it creates and best support the region, its local authorities, businesses, developers, and residents.

1.0 Introduction

Our ambition is to lead the way in the provision of high quality, sustainable and efficiently delivered new homes for residents in our region while driving forward the capability and growth of our advanced manufacturing businesses and creating new employment opportunities for our workforce.

Our Homes for the Future Strategy is the latest step in our work to encourage and incentivise the construction industry to accelerate its shift towards low and zero carbon new homes. The strategy builds on our previous work on advanced manufacturing in construction and zero carbon homes, maximising the benefit to be derived from the HMG's Future Homes Standard which will come into force in 2025.

We will go further and faster by setting out a core set of enhanced sustainability, climate resiliency and construction methodology targets. This will enable us to allocate land, funding and other support to projects that can be shown to meet our expectations. This approach will support us to achieve **WMCA's net zero target by 2041**, ahead of the UK's national target of 2050.

Homes are the highest carbon emitters in our region, accounting for **39% of emissions**, ahead of both industry and transport. Retrofitting an existing home is estimated to cost **five times more** than designing a new home which is energy efficient. By building sustainable new homes now, we will therefore reduce the need for retrofitting within the region and avoid adding to the **1.2 million homes** within the West Midlands that currently need retrofitting.

Our output-based approach will help developers to produce warmer, safer, more energy-efficient homes; tackle fuel poverty; and reduce the threat from energy price hikes. This approach will boost confidence and capability in the construction industry so that new technologies, driven by advanced manufacturing construction, become the established approach to delivering zero carbon homes, supporting a transition to greener construction, and increasing the number of green, sustainable jobs in the construction sector.

2.0 Policy background

National Policy

National Government is incentivising advanced and modern methods of construction as a means of modernising the construction sector. Building regulations will change in 2025 and further change is likely in the future.

In relation to construction skills, National Government has recognised the need to promote Advanced Methods of Construction (AMC) and Modern Methods of Construction (MMC) as a way of establishing a more productive and sustainable industry model since the Housing White Paper of 2017. This has been most clearly articulated in the 2021-2026 Affordable Homes Programme which sets mandated minimum levels of Modern Methods of Construction on supported projects including those with Homes England's Strategic Partners. Homes England reaffirmed this commitment in its latest 2023 – 2028 Strategic Plan which includes Key Performance Indicators for MMC and Sustainability Performance, including targets for both operational and embodied carbon.

In relation to sustainability, Government has recognised the inevitability of having to regulate the industry's decarbonisation journey, starting with operational carbon via the Future Homes Standard which will be introduced in 2025. While Government has not yet signalled the regulation of embodied carbon, there is increasing parliamentary receptiveness and lobbying momentum through the Part Z campaign. The perception in industry is that embodied carbon will also eventually be regulated, bringing the UK into line with several other countries including the Netherlands, France, Finland and Denmark.

At present, Government has not connected advanced or modern methods of construction with decarbonisation through policy or regulation, preferring to allow industry to develop its own solution, but there are clear signs that there will be policy shifts in future. Through making this link, WMCA sets itself apart not only from government, but also from other regional authorities.





Regional policy


Regional policy on advanced and modern manufacturing in construction and zero carbon homes has been developing for some time. WMCA's previous work has shown that it is only through construction modernisation that net zero aspirations can be achieved at scale.

Our Roadmap for Advanced Manufacture in Construction helped us to set out expectations, on WMCA-funded projects, that new developments of a certain size should incorporate elements of Modern Methods of Construction. We recognised that the wider definition of 'AMC' had significant potential to drive a range of long-term benefits to the construction industry and that, by encouraging the use of advanced manufacturing components on new home developments in the West Midlands, we could deliver considerably wider benefits to the region.

It was also recognised that use of AMC could support five of WMCA's existing policy goals for sustainable and inclusive growth:

- Accelerating housing delivery
- Delivering a zero-carbon future
- Investing in regional and inclusive growth
- Design that reflects the character, context, and aspirations of our communities
- Creating climate resilient and future proof homes that are safer and warmer for our communities.

Following the work on advanced manufacturing, the West Midlands Zero Carbon Homes Routemap set out a series of requirements for new homes to achieve defined net zero standards in operation. The goal was set to deliver zero carbon homes in the region by 2025 and achieve net zero carbon emissions in line with WM2041. The Zero Carbon Homes Routemap sets out programmes of action over the short, medium, and long-term which enable the WMCA, and its partners, to meet these ambitious targets.



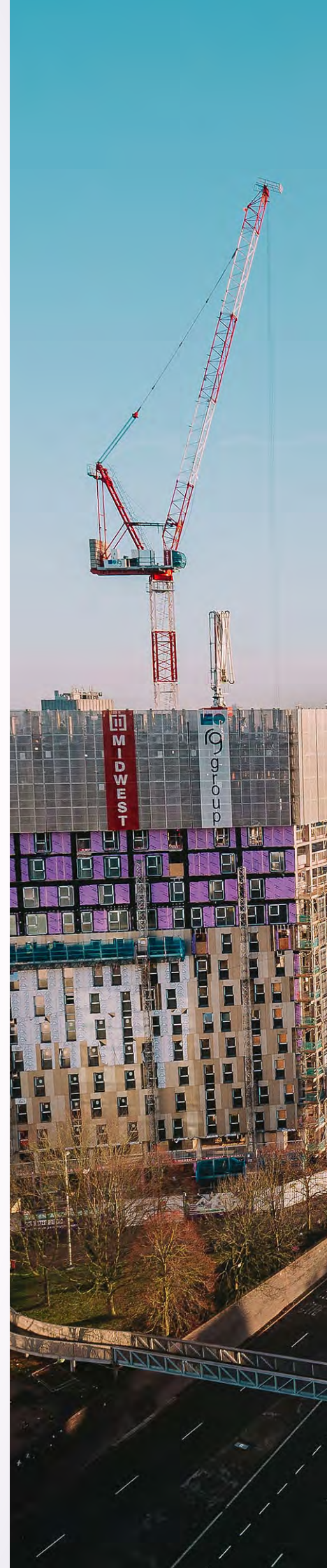
The Homes for the Future Strategy builds on this pioneering work to date. It also branches out more widely to act as an integrated strategy and a cross-cutting document that is directly linked to a range of wider regional policies and programmes including:

- unlocking the potential of the ‘Manufacture of Future Housing’ economic cluster in the West Midlands Plan for Growth (launched July 2022)
- the West Midlands brownfield housing and regeneration programme (launched in the 2018 Housing Deal)
- #WM2041
- Investment and Levelling Up Zones (March 2023 Devolution Deal)
- the Affordable Housing Programme (March 2023 Devolution Deal)
- the Public Land Programme (March 2023 Devolution Deal)
- the investment opportunity in future homes set out in the West Midlands Investment Prospectus (launched May 2023); and
- the high-level deliverables of the Housing & Land Portfolio agreed by WMCA Board (February 2023).

Through the West Midlands Plan for Growth the region has laid out a path for returning to a growth trajectory, spreading opportunity and jobs across the region and helping to level-up the UK. The Homes for the Future Strategy will help to revolutionise the modern construction industry, not least by increasing the rate of production.

Also, by expanding the skills base of the modern construction industry, WMCA can help to upskill workers, future proof jobs and increase skills in an in-demand job sector. Being a pioneer will create a skills base that will make West Midlands workers and knowledge in demand across the country.

The programme will also showcase the potential of the region, attracting further investment, confidence and funding. It will show that the region is able to lead both nationally and internationally when it comes to decarbonisation and modern methods of construction.





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3.0 Market Perspectives

The construction challenge

The traditional construction sector suffers from systemic challenges which significantly and negatively affect its capacity to supply the homes of the future that the West Midlands will need.

Data from the Office of National Statistics confirms that the economically active workforce has reduced by 11% since 2019, a combination of demographics, the pandemic, migration patterns and insufficient new talent replenishment. One third of the workforce is now aged over 50 and the average age is increasing, yet in many physically intense trades most workers plan to retire at 55-60 years old and not at the state retirement age. The Construction Industry Training Board (CITB) in its most recent survey estimated that 25,000 extra construction workers are needed in the West Midlands in the next 4 years, yet societal change means a smaller talent pool is choosing construction as a career.

Amplifying the workforce challenge is anecdotal evidence that productivity has declined further since the pandemic from what was already a low base. This is now driving wage inflation and reducing relative output, creating resource scarcity which threatens viability of future projects. The combination of regulatory change relating to both carbon and safety, with a shrinking construction workforce and shortages of key traditional skills, creates an unsustainable situation.


We therefore have a national and regional productivity and resource security risk which requires immediate action to safeguard our ability to build more and better-quality homes in the future with the growing threat of a resource constrained workforce. The status quo is not an option. Homes for the Future is therefore not just an environmental necessity, but an economic one.

Signs of change

The pivot towards more advanced methods for building homes has been slow to emerge over the last few years despite Government incentivisation and mandate through programmes such as the Affordable Homes Programme.

In the past eighteen months, however, the combination of a growing realisation of the extent of workforce erosion and the likely implications of the Future Homes Standard is starting to motivate major national housebuilders to review their construction strategies. Several major housebuilders have embarked on building factories to produce a proportion of their new homes to safeguard additional capacity despite workforce challenges, driven by recognition of the twin challenges of resource scarcity and carbon reduction.

These businesses are formally linking AMC and MMC with the ability to deliver higher performing homes in bigger numbers. While the fact that major housebuilders are now comfortable with new methods shows that past concerns about robustness and access to mortgage finance have been addressed.



A West Midlands regional agenda which formally links AMC with decarbonisation of housebuilding can therefore be seen in the context of an increasing acceptance by industry that things are changing. Businesses of all sizes need to prepare for this change by doing more than small scale pilot or research and development projects.

Current Manufacturing Capacity in the West Midlands

The West Midlands AMC sector has the capacity to deliver around 4,500 new homes using AMC today which, if undertaken would represent roughly 10% of the UK-wide output. Presently, the West Midlands is delivering around 2,000 to 2,500 homes per year of that capacity. Delivery of an additional 2,000 homes per annum in the region using AMC is equivalent to 2 factories with 1,000 homes per annum capacity or one larger facility that would accommodate the entirety of the additional 2000 homes.

Evidence suggests that growth in AMC and MMC, particularly that around volumetric is highly additional and will not displace existing construction activity. Recent setbacks and high profile company failures in the volumetric sector show that this has been a challenging model to establish and mature. Residential construction is a highly cyclical sector and emergent businesses with high costs of entry into the market are particularly exposed to those cycles. As such the approach taken in our strategy is, first to drive confidence into the sector by showing leadership and increasing demand for manufactured solutions, and second to take a technology-agnostic approach through the use of PMV, enabling the market to respond in range of ways. This approach is likely to generate a considerable degree of economic value through the wider supply chain. It is anticipated that AMC and MMC activity will indirectly support 560 jobs in the supply chain, generating roughly £44m in Gross Value Added in the West Midlands.

The need for leadership

As part of this process, there is a need for strong leadership as the industry remains traditionally cost conscious and focused on the near term. The uptake of advanced building techniques in the West Midlands can be accelerated using the tools and powers secured by the region through its devolution and funding deals with Government. The intelligent use of public land supply, affordable housing funding, brownfield funding, levelling up and investment zones, strategic partnerships and the use of best value procurement tools to level the playing field, can all help offset the short-term additional costs of innovation, prior to anticipated long-term cost savings.

This strategy places the West Midlands at the vanguard of a wave of change in housebuilding over the coming decade. In doing so, it will give our local supply chain a significant first mover advantage in growing capacity, capability and to scale the technical solutions that will be required nationally in the coming years.

4.0 Framing our strategy

The [West Midlands Inclusive Growth Framework](#) lays out our vision for delivering inclusive growth across the region. Ensuring that our residents live and work in healthy environments is vital to achieving this vision. Decent homes which are affordable, safe and fit for purpose have a huge impact on an individual's ability to thrive and access opportunities where they live. The Homes for the Future Strategy takes critical steps towards our ambition for inclusive growth, with the potential of delivering a number of significant benefits.

Fuel poverty

Over half of all neighbourhoods in the West Midlands are in the bottom 20% when it comes to fuel poverty, nearly three times the national average. An estimated 235,512 homes are classed as being fuel poor homes. At 17.5% of all homes, this is the highest rate of fuel poverty in any English region, with some local areas experiencing much higher rates of over 40%. The Homes for the Future Strategy will help to alleviate this problem by reducing costs for occupiers, building a better physical fabric for new homes with higher insulation standards and reduced energy costs.

Health and well-being

Well-designed and well-built homes also have an impact on our health and well-being. Since the publication of the Marmot Review in 2010, life expectancy in England has stalled and health inequalities have continued to widen. Across the region, both life and healthy life expectancy remain lower than the national average. This has been both exposed and exacerbated by the coronavirus pandemic and the cost-of-living crisis, with our ethnic minority communities among those most affected.

Cold homes can affect or exacerbate a range of health problems including respiratory and circulatory problems and increase the risk of poor mental health. It is estimated that 10% of excess winter deaths are directly attributable to fuel poverty, and a fifth of excess winter deaths are attributable to the coldest quarter of homes. Cold homes can also affect wider issues, such as educational performance among children and young people, as well as work absences.

Homes for the Future means that the region will be able to deliver more sustainable, warmer, more energy efficient, climate resilient homes that will be healthier, happier properties for residents to occupy from the outset, reducing the need for later improvements.





Zero waste construction/Circular economy

Research conducted during the preparation of WMCA's Circular Economy Routemap found that the construction industry is responsible for over 50% of the waste produced in the West Midlands. The move to a circular economy can extend the life cycle of the resources used to make products, reducing or eliminating waste. It can also drive clean economic growth and the creation of tens of thousands of new jobs in low carbon and green technologies.

The transition to a circular economy - one which encourages the repair, reuse and regeneration of resources and materials as well the use of renewable energy - is seen as critical if the West Midlands is to achieve its target of becoming a net zero carbon region within the next 20 years. Homes for the Future will support the move towards more sustainable construction materials, generating skills and talent within the region, and will encourage a shift to more locally and sustainably sourced construction materials with a consequent reduction in the waste of construction materials.

Retrofit

WMCA has ambitious plans to retrofit 50,000 homes across the West Midlands, targeting older homes that have low energy efficiency and cause households to pay far too much on their energy bills.

As well as supporting WMCA's ambition to become net zero by 2041, modern construction techniques will also contribute to improvements in local employment and training. The Homes for the Future Strategy also helps to ensure that we are not constructing more homes that will need to be retrofitted in the future.

Climate adaptation and resilience

Rising temperatures bring changing weather patterns and climate-related hazards, including (but not limited to) longer and more frequent heatwaves, increased flood risk, disrupted supply chains, power cuts and water scarcity. The West Midlands built environment is designed for past and current – rather than future – climate scenarios. There is a need to adapt how we design properties and the materials we use to build them to ensure that they are resilient against climate-related impacts.

The Homes for the Future Strategy will improve the resilience of new developments to heat-related risks through consideration of:

- **passive design options**, protecting properties and occupants from the risk of heat stress and overheating
- **ventilation and airflow** to prevent overheating and improvement of air quality
- **comprehensive overheating analysis** to ensure all habitable parts of the property are comfortable and liveable for occupants
- **fabric performance** under future climate scenarios
- **the BRE Home Quality Mark** to demonstrate that property design has accounted for climate risks to health and wellbeing and running costs of the build

5.0 Inclusive growth and climate resilience

Our strategy is designed to sustain the West Midlands leadership position in manufacturing and some forms of construction technologies. Our strategic response has been to set an ambitious long term performance standard for new homes, aligned to a series of realistic but challenging interim milestones. These standards are all aligned to industry benchmarks and, critically, are outcome targets which specify the performance that we require, not the technologies or solutions that might be used to achieve them. This will allow us to incentivise innovation and participation across the whole supply chain including SMEs.

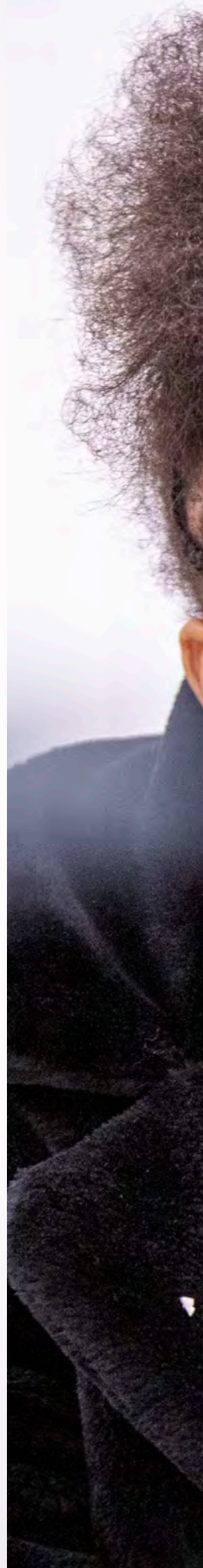
Brownfield Land - The West Midlands already has a national leadership position in brownfield remediation through its National Brownfield Institute and multi-million-pound brownfield regeneration programme, and our strategy is intended to augment this position in the areas of advanced manufacturing in construction and net zero housebuilding.

Plan for Growth - The region's medium term growth strategy, the Plan for Growth, identifies the manufacture of future housing as one of eight key growth cluster opportunities for the region, with the potential to add 3,700 new, high value jobs to the West Midlands' economy.

This flexibility means that the strategy can support more inclusive and diverse supply chain growth – for developers, investors, and suppliers – and will be open to any supplier or innovator who can robustly achieve the technical standard, from major businesses to start ups and SMEs.

The strategy has also been designed to ensure that we do not force the industry to move solely towards 'modular' or volumetric housing. The recent, well publicised challenges of some suppliers and housebuilders show clearly that the likely maturity profile of the UK's AMC/MMC market will require a diverse range of solutions spanning all seven of the Government's defined categories of MMC covering panelisation, sub-assembly use, innovative materials, and on-site technologies.

The outcome specification set out in our strategy will enable more hybrid approaches to AMC/MMC to be brought forward to achieve the standard.





Research and Development

We will further develop strong relationships between regional academic institutions and industry. The West Midlands has some of the strongest examples of vocational education in the country through organisations such as Dudley College and the School of Architecture and the Built Environment at Wolverhampton University.

The region's strong manufacturing research and development network such as The National Brownfield Institute (NBI), the Warwick Manufacturing Group (WMG) at Warwick University, the Manufacturing Technology Centre (MTC) will support delivery. Homes for the Future will create an improved data and evidential base from which both WMCA and its regional partners can utilise to continue to build upon best practice.

6.0 Proposed Technical Standard

Our proposed Homes for the Future Technical Standard would provide clarity around the targets that must be achieved and the potential methods of achieving them. It provides a long-term ambition aligned to short term progressive changes and allows industry to evolve solutions in response. It reflects ambitions in both national and regional policy and, as such, aims to incentivise:

- a speedier and more comprehensive adoption of more productive and assured outcome building techniques
- a higher standard of energy performance compared with the Building Regulation changes, and
- reduced embodied carbon in construction that is not part of Building Regulations at present.

Measuring performance standards

The Technical Standard translates these objectives into measurable performance standards with increasing target levels of performance from the current baseline to 2030. Those measures and targets are considered under headings:

Construction: More productive building techniques

- This is measured using the Pre-Manufactured Value (PMV) metric which calculates the material proportion of a building project's cost as opposed to other cost factors including plant, labour, and management. This is a proxy metric for the extent of AMC/MMC as the greater the extent of AMC/MMC, the greater the material element relative to other project costs. PMV is already used as a tool by Homes England to incentivise AMC/MMC use.
- PMV does not favour any building technology over another, and increased PMV can be achieved in a number of ways, providing developers with the space to innovate and develop efficient models of delivery without specifying which construction methodologies should be pursued.

Sustainability: More new energy efficient homes

Through a mix of careful design, enhanced fabric efficiency and the inclusion of non-fossil fuel energy sources such as heat pumps and solar panels, the aim is to incentivise the delivery of new, more energy efficient homes. Two industry standard metrics are used to measure these requirements:

- the energy intensity of a new home: the amount of energy required to use it, proportional to its size
- the space heat demand: a measure that describes the amount of heat required to heat a building and maintain the inside at a particular temperature.

The achievement of these standards places requirements on developers to use higher performing building materials, different heating technologies, and to design for high energy performance from the outset.

Sustainability: Reducing life cycle carbon in construction

- Carbon emissions are created by the materials used in constructing new homes, and by the construction process itself. This is known as embodied carbon and it can be reduced in several ways including the use of lower carbon materials, reduced material and process waste and smarter site operations such as fewer transport journeys.
- There is no requirement in building regulations or other legislation to reduce these embodied carbon emissions. To take a leadership position, however, and to align with best practice in other countries as well as the likely future trend in the industry, we will require projects funded by WMCA progressively to reduce embodied carbon. This will be measured using the whole life carbon assessment as defined by RICS and aligned to the LETI timeline. The new Net Zero Carbon Buildings Standard is currently being developed and we will ensure the carbon metrics in our strategy are aligned in terms of definitions and measurement protocols.

Overall, the achievement of these standards places requirements on developers and contractors to use higher performing building materials, different heating technologies, and to design for high energy performance from the outset.



The Standard, Targets and Trajectory

Our technical standard and targets are being driven by future changes in national standards such as the introduction of improvements to the minimum standard of fabric efficiency required by building regulations, with a first step implemented in 2023 and a further improvement to follow in what is known as the Future Homes Standard in 2025. The precise extent of this standard is currently being fixed by Government following engagement with the sector, led by an industry group known as the Future Homes Hub. Our Construction and Sustainability Targets, as defined within the Technical Standard, this provides:

- a granular description of how the standards can be achieved
- a clearly defined trajectory increasing over time
- a definition of the evidence required for funding purposes.

Table 1 provides a snapshot of these requirements.

2030 Target - Achieve net zero carbon in construction and in operation

Energy Use Intensity:

- EUI: <35kWh/m² operational energy use (including regulated and unregulated energy).
- Space heating demand of <15KWh/m²/yr

Upfront Embodied Carbon:

- Embodied carbon calculation to verify target equivalent to <300kgCO₂/m²

Modern Methods of Construction:

- All developments achieve PMV of 55%

2025 Target - Achieve net zero carbon in operation

Energy Use Intensity:

- EUI: <35kWh/m² operational energy use (including regulated and unregulated energy).
- Space heating demand:15-20 KWh/m²/yr

Upfront Embodied Carbon:

- Embodied carbon calculation to verify target equivalent to <400kgCO₂/m²

Modern Methods of Construction:

- All developments achieve PMV of 50%

Statutory Plus Target - Enhanced measurement and monitoring

Energy Use Intensity:

- Dwelling Emission Rate against the Target Emission Rate of Building Regulations Part L 2021

Upfront Embodied Carbon:

- As a minimum all delivery partners must measure embodied carbon impacts of the proposed construction.

Modern Methods of Construction:

- Review opportunity for PMV uplift across all MMC categories

7.0 How we propose to apply the Technical Standard

The Technical Standard would be embedded in our requirements for devolved housing and land funding as part of the Single Assurance Framework process. The Technical Standard defines the minimum required outcomes and lays out the codified expectations that any applicant for residential funding should achieve, as well as how these can be achieved. Embedding this robust standard as part of our future pipeline is essential to support the delivery of new homes enabled by the Deeper Devolution Deal (March 2023). Combined with guidance documentation for investors and developers, we will ensure the provision of clarity in relation to the standard, how it can be achieved and the benefits of doing so.

Measuring Compliance

The standard is based on a 'yes/no' approach to measuring compliance, meaning that its requirements can be quantitatively described, measured and assessed. This will enable transparent and consistent decision-making based on compliance with the standard, and robust reporting and monitoring of impact and performance. While some within the construction industry will welcome this shift, and some already have plans to operate above the government's standard, others can be reluctant to adopt new approaches, particularly in relation to a subject on which there is limited understanding at present. To achieve this, the Technical Standard makes provision for an 'exceptions approach' which recognises that, in some circumstances, the new standard cannot yet be achieved. In those cases, developers will retain their ability to apply for funding, subject to adopting relatively minor process changes and, crucially, measuring and monitoring the carbon performance of their projects. This is intended to drive understanding and behaviour change even where practical change is not yet possible.

Pre-manufactured value (PMV)

While the region will promote the fullest definition of pre-manufacturing in calculating PMV scores, Homes for the Future has been created to incentivise the use of a wide range of manufactured solutions. The PMV metric allows developers to choose the most appropriate method for achieving the minimum level of off-site manufacture, which in turn will allow the market to decide the optimal technical solutions to achieve the performance standards required. This approach will support the establishment of a fully diverse supply chain which spans lower tech solutions such as timber framing through to more advanced panelisation techniques, sub-assemblies such as internal pods and service cupboards, innovative materials and new on-site technologies and process improvements.

High quality homes, high quality design

Above all, irrespective of method and material, the West Midlands wants to promote high quality. Innovation is no excuse for poor quality, so it will be imperative that robust technical accreditation is used, testing and certification methods are utilised, combined with a competent and appropriately skilled workforce both on and offsite.

8.0 Projects paving the way

Throughout the West Midlands, there are various projects, at various stages of completion, that meet at least some of the expectations of Homes for the Future, providing proof of concept and viability.



Smith's Garden - Goodstone Living & Elements Europe

Status: RIBA Stage 4 Design

The Camp Hill Gardens site is approximately 1km southeast of Birmingham City Centre within Digbeth, previously occupied by a manufacturing business. The 550-unit scheme includes five blocks ranging from 26 to 3 storeys, all built-to-rent tenure. The development also provides shared amenity space and approx.—1,480m² of commercial units. Once completed, Camphill will be one the largest BTR scheme in Europe to be delivered with MMC Category 1.

Godstone Living set ambitious ESG Targets for the development, including exceeding the requirements of Part L 2021, BREEAM: Very Good, FitWel: 3 Star and Wirescore: Platinum. The project targets a 50% reduction in operational carbon against current regulations by adopting measures such as the use of electric panel heaters for space heating and air source heat pumps for hot water. The project also incorporates digital technologies to track energy performance with personalised feedback to residents, all while maintaining stringent data privacy standards. Through a data-driven strategy focusing on “behavioural change,” the objective is to encourage residents to adjust their interactions with the building, gradually reducing energy consumption.

An optimum MMC-based delivery has been adopted to help support ESG targets. This approach aims to substantially decrease carbon emissions from on-site activities, transportation, and the extraction and disposal of materials. Elements Europe are appointed to design and manufacture the MMC Category 1 Volumetric Modules in parallel with delivering onsite works. The frame will be constructed via an in situ concrete transfer deck and slipform cores, with the modules installed around the cores forming the blocks.

Key Stats:

- Upfront Embodied Carbon: 515 kgCO₂/m²
- 70% PMV
MMC Category 1



How does this project perform against the WMCA Homes for Future Technical Standards?

Key: ● = Project Metrics

M = Measure and Monitor

	Statutory Plus	2025	2030	
Energy	Operational Energy (kWh/m ²)	M	< 35	< 35
	Space Heating Demand (kWh/m ² /yr)	M	15 - 20	< 15
	Embodied Carbon (kgCO ₂ /m ²)	M	< 400	< 300
	Pre-Manufactured Value Material cost/total cost ratio	M	50	55

Project Metrics: 515 (Embodied Carbon), 70 (Pre-Manufactured Value)
 Data not measured: Operational Energy, Space Heating Demand, 2030 Pre-Manufactured Value

Citizen Housing Pilot Scheme - Littlethorpe

Status: Completed and Occupied

Citizen Housing has recognised the impact of communities in delivering small infill sites that are not possible to deliver through traditional means via the exploration of modular construction.

Citizen Housing appointed Totally Modular to provide a full turnkey solution whereby two energy-efficient houses for affordable rent were constructed using MMC Category 1 on a redundant infill site suffering from blight. The houses were installed on-site in less than 48 hours and received an A+ EPC rating compared to the national average of a D rating. The houses were completed off-site in controlled factory conditions, and they exceeded building regulations, therefore providing higher manufacturing solutions with lower risk and greater speed, cost-effectiveness, and consistency. Both houses scored a 98/100 CO₂ rating, predicting that each house will generate just two tonnes of CO₂ yearly, compared to a UK average of six tonnes.

The off-site production reduced waste by up to 80% and helped reduce CO₂ by 50% compared to traditional site construction. The solar panels with battery back-up guarantee residents a 20% saving on fuel bills. Annual analysis showed total running costs at £1.48 a day for the three-bedroom, five-person house. Air source heat pumps and mechanical ventilation with a heat recovery system are installed to manage air quality.

Key Stats:

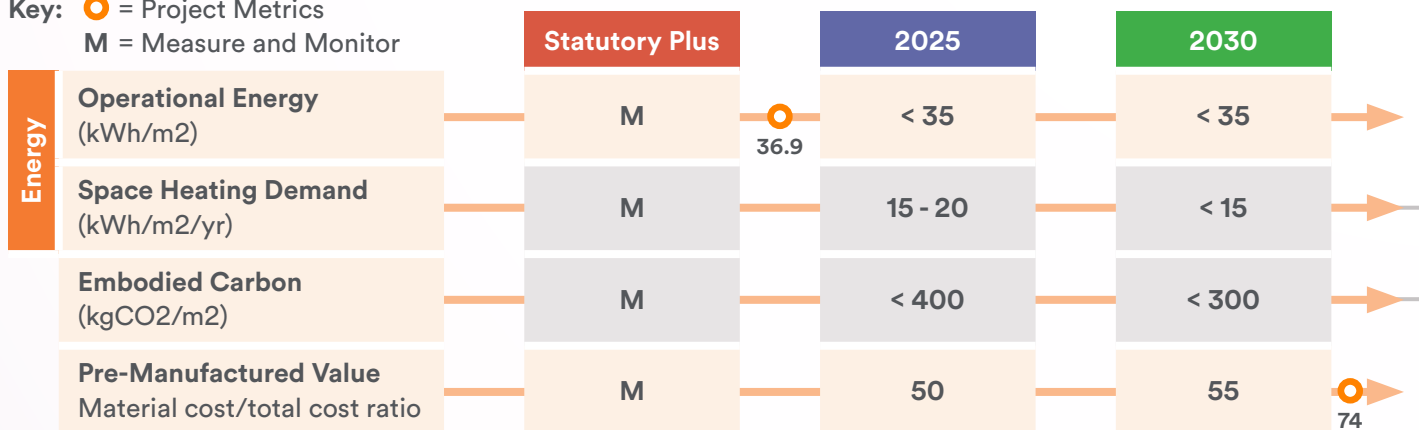
- Energy
Operational Energy:
(2-bed) - 37.49 kWh/m²/yr.
(3-bed) - 36.92 kWh/m²/yr.
- Generating 2 tonnes of CO₂ yearly in operation compared to the UK average of 6 tonnes.
- 74% PMV
95% of the houses built offsite



How does this project perform against the WMCA Homes for Future Technical Standards?

Key: ● = Project Metrics

M = Measure and Monitor



Donnington Wood Way, Telford - Lovell

Status: In Construction

Donnington Wood Way is an inter-generational new community being developed through a collaboration between Telford and Wrekin Council via their wholly-owned company Nuplace, Lovell, and Wrekin Housing Association. It is set to deliver 329 new dwellings and will regenerate 15.24 ha of brownfield land. Construction commenced in Summer 2021 for completion in early 2025. The new development incorporates Affordable, Open Market Sale, Care and Dementia Care and Private Rented Homes.

As part of the Energy and Sustainability Strategy development, it was agreed that a section of the site should be used to showcase the Government's Future Homes Standard; at this point, 16 of the 329 houses have been selected for the pilot. The pilot will feature a highly efficient specification to be trailed, which aims to be a circa 80% betterment to current building regulation requirements.

The brief of achieving a best value approach to sustainability for all parties has led to the development of a strategy ensuring that all facets of sustainability were considered to provide residents with comfortable, good quality homes with low energy use and flexibility for future adaptation.

In selecting sustainability lead solutions, Lovell, in collaboration with supply chain partners, assessed various MMC solutions and opted for MMC Category 2 Closed Panel Timber Frame and Structural Insulated Panels (SIPS) as the preferred solutions to meet the fabric requirements. There is an emphasis on using a local supply chain, with over 75% of the materials being sourced locally, further reducing the upfront embodied carbon. The combined approach delivers a significant reduction in CO2 emissions across the site, due to the strong fabric performance, Air Source Heat Pumps, MVHRs and Solar PV with smart technology through battery storage.

Key Stats:

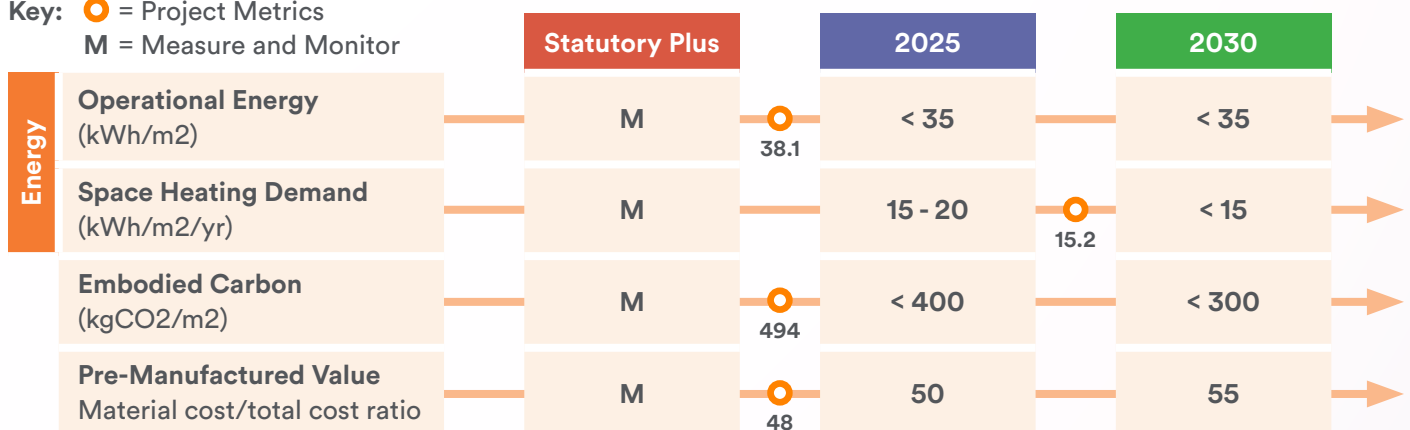
- Upfront Embodied Carbon: 515 kgCO2/m2
- 70% PMV
MMC Category 1



How does this project perform against the WMCA Homes for Future Technical Standards?

Key: ● = Project Metrics

M = Measure and Monitor



Brick House - Urban Splash

Status: Completed and Occupied

Brick House is a development comprising 37 mews houses designed by Howells for Urban Splash in partnership with Places for People and Canals and River Trust. Infused with an architectural essence reminiscent of the Georgian era, these new homes are strategically centred around a communal garden and a historic canal, emphasising car-free green streets and public green spaces. Unlike typical terraced houses, these homes aimed to prioritise air tightness and insulation, combining aesthetic appeal with enduring, high-quality construction.

What sets this project apart is the integration of digital technologies aimed at providing occupants with a seamless and enhanced living experience. Notably, the inclusion of electric room heaters controlled through online smart apps, a room thermostat, and Mechanical Ventilation with Heat Recovery (MVHR) operating at an impressive 88% efficiency marks a shift towards modern, energy-efficient solutions. In addition, the choice of electric cooking eliminates the reliance on gas or fossil fuels, aligning with sustainable practices.

This project underscores a holistic approach to seamlessly merging contemporary technologies with traditional construction, showing an incremental approach to delivering enhanced sustainability targets.

Key Stats:

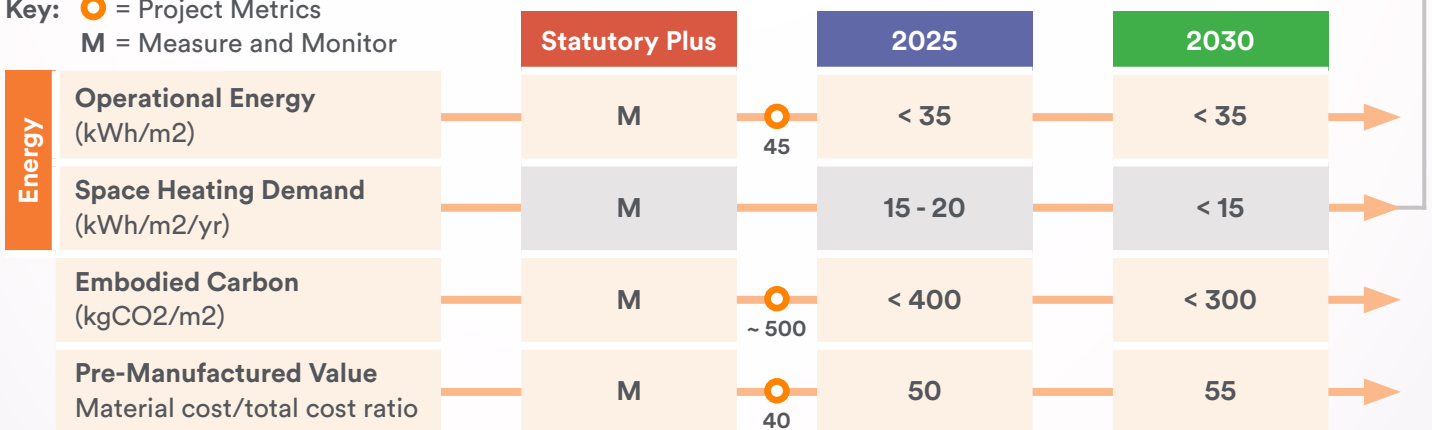
- Energy (estimated)
Operational Energy: 45 kWh/m²
- Upfront Embodied Carbon (unverified by third party): 500 kgCO₂/m²
- 40% PMV
Standard brick cladding facade onto blockworks



How does this project perform against the WMCA Homes for Future Technical Standards?

Key: ● = Project Metrics

M = Measure and Monitor







**West Midlands
Combined Authority**

We welcome any and all feedback

Please reach out to us via invest@wmca.org.uk by the 22nd January 2024