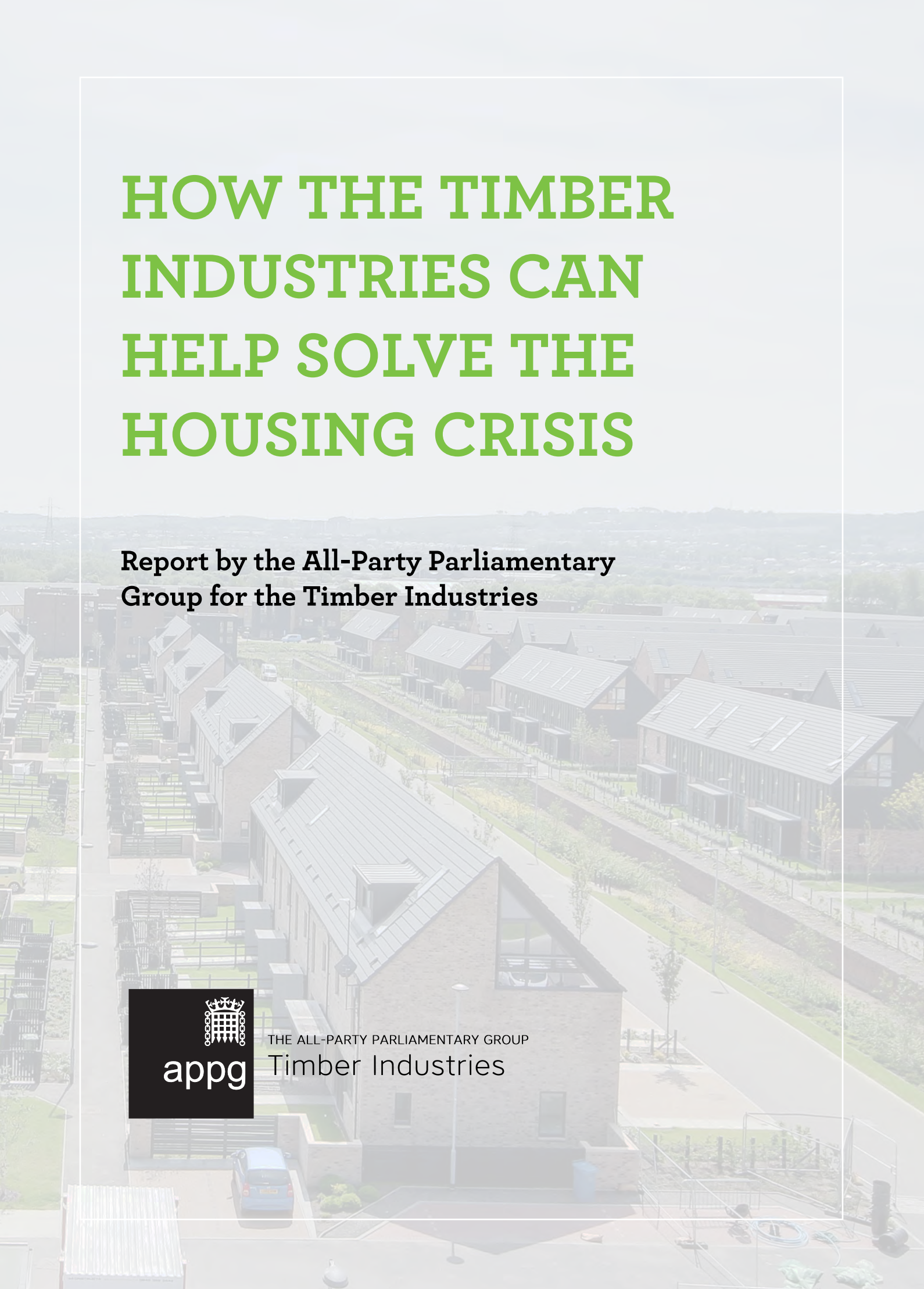
HOW THE TIMBER INDUSTRIES CAN HELP SOLVE THE HOUSING CRISIS

Report by the All-Party Parliamentary Group for the Timber Industries



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THE ALL-PARTY PARLIAMENTARY GROUP
Timber Industries

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FOREWORD

It is accepted that the next generation face a changing world, one that poses a different and far more difficult set of challenges than the recent past.

Of these broad ranging challenges, I believe three are most pertinent.

How do we provide future generations with skilled, long-term employment? How do we address the growing demand for secure, affordable homes? How do we face up to the global climate emergency threatening our planet?

There is of course no single answer to these challenges, but unlocking the potential of timber, as a core building material, can offer a significant contribution to each dilemma.

The timber industry will provide skilled jobs, it can deliver sustainable and affordable homes and it should be at the forefront of addressing the climate emergency we face.

Whilst I am fortunate to have world leading timber supply side sites and a thriving forestry sector in my constituency of East Lothian, I am certainly not alone; every parliamentarian shares a local link to this wide-ranging industry.

This is a sector that has proven it can provide skilled long-term careers, beginning with apprenticeship programmes from forestry all the way through to the housebuilding industry.

There are over 200,000 people employed within the timber sector alone, however we need a greater impetus to attract future generations (16-24) to want to work within this wider field. I am hopeful that this report will remind all governments of the long-term skills challenges that this industry, like so many others, faces.

One part of the UK where these skills have been embraced is in Scotland, as over 83% of new-build homes are constructed using timber. We are not only leading the way but crucially changing perceptions about the effectiveness and durability of this core material to build homes for the future.

I welcome the ambitious housebuilding targets that all governments have made. I passionately believe that if we can continue to provide home-grown timber and maintain sensible customs relationships on imported wood, this material is best placed to build the millions of new homes we will require over the next 25 years.

There is an ecological imperative in increasing the use of wood-framed homes. We are in the midst of a climate emergency and this requires fundamental changes to our built environment and our future infrastructure.

Housebuilding should be part of an environmental revolution that is firmly integrated into our net-zero emissions targets.

Using timber will sequester carbon within homes for generations and is markedly more environmentally friendly than other core building materials such as concrete. Following discussions in the preparation of this report, the enormous potential of timber as the building block for carbon-neutral buildings in the near future was clearly made.

I hope this report sets a new trajectory of thought within government by outlining the economic, social and environmental benefits of timber.

Throughout the UK we seem to have all the jigsaw pieces on the table, a thriving wood and forestry sector, world leading technical expertise, architects at the forefront of design and an enthusiastic potential workforce. It is up to the UK government, the devolved nations and our local regions to help complete the jigsaw for the sake of future generations.

Martin Whitfield

Martin Whitfield MP
Chair, All-Party Parliamentary Group for the Timber Industries

We need to train

195,000

new skilled workers in the British construction industry within the next seven years

The Government wants to build

300,000

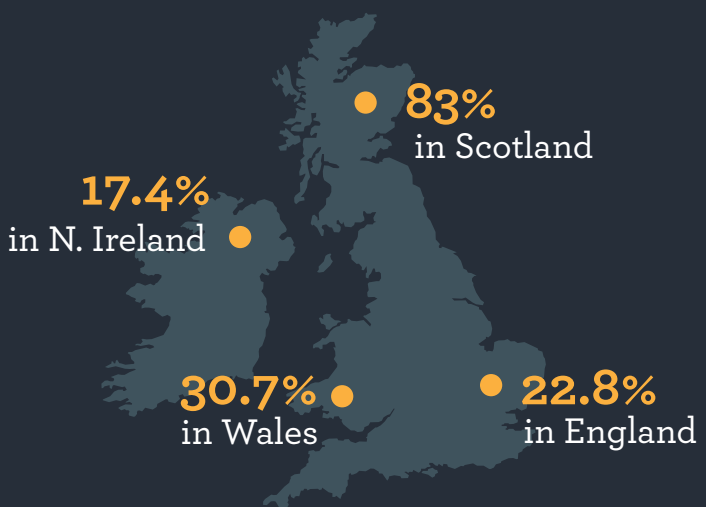
new homes in England per year (up from **220,000** now)

The Government wants to achieve

zero

carbon emissions by 2050.

Right now the UK is building **1/3** of new homes using timber frames, including:



If the timber industry built **270,000** new homes per year, this would allow...

3,000,000
tonnes of carbon dioxide to be absorbed and stored per year

30%
quicker build times

90%
waste reduction from off-site construction

And help to...

- ✓ Encourage tree planting and forest management
- ✓ Boost local economic development
- ✓ Modernise the construction industry
- ✓ Develop a low carbon economy

INTRODUCTION: A SNAPSHOT OF THE HOUSING CRISIS

A House of Commons Library briefing paper produced last year estimated that between 240,000 and 340,000 new homes need to be built in England per year to tackle the housing shortage.[1] With the market currently failing to balance supply with demand, both the Government and industry accepted following the *Farmer Review* that there needs to be a step change. All political parties agree action is needed and have made house building pledges in their respective manifestos.

The Public Accounts Committee (PAC) has found the Ministry for Housing, Communities and Local Government does not have the mechanisms in place to achieve the 300,000 house building target.

The current Government has pledged to support the delivery of a million homes by the end of 2020, and half a million more by the end of 2022, with the aim of building 300,000 net additional homes a year on average from 2025.[2] A new vision for the market has been laid out by the Government in the Construction Sector Deal, which included new funding, support for small businesses, and targets to boost the delivery of new homes. Meanwhile the Labour Party pledged in its 2017 manifesto to build at least 100,000 council and housing association homes a year by 2022 for genuinely affordable rent or sale.[3]

Many of the issues at play were made explicit in the Government White Paper, *Fixing our broken housing market*, which lists a complex, interweaving set of challenges such as: low productivity, a lack of investment, an ageing workforce and poor planning as all having contributed to the average house costing almost eight-times what the average Briton earns, an all-time record.[4]

While the number of new build homes being built has been on the rise, up to 195,290[5] in 2017-18, the Public Accounts Committee (PAC) has found the Ministry for Housing, Communities and Local Government does not have the mechanisms in place to achieve the 300,000 target.[6]

As housebuilding is a significant driver of economic growth and employment throughout the UK, including local economic development, these targets cannot be allowed to fall by the wayside.[7] Housing is consistently ranked as one of the top issues being faced in Britain, with one recent survey by IPSOS and the Chartered Institute of Housing finding that 55% of Britons think the issue of housing has been discussed too little over the past few years, and 73% believing that there is a housing crisis in Britain and rejecting the inability of government to take action.[8]

[1] Wendy Wilson and Cassie Barton, *House of Commons Library Briefing Paper: Tackling the under-supply of housing in England* (12 December 2018) (accessed 20 June 2019).
[2] HM Government, *Industrial Strategy Construction Sector Deal*, (5 July 2018) (accessed 16 August 2019).
[3] The Labour Party, *For the many, not the few* (May 2017) (accessed 12 June 2019).
[4] Ministry of Housing, Communities and Local Government, *Fixing our broken housing market* (February 2017), (accessed 16 August 2019)
[5] Ministry of Housing, Communities and Local Government, *Housing supply; net additional dwellings, England: 2017-18* (15 November 2018) (accessed 15 October 2019).
[6] House of Commons Committee of Public Accounts, *Planning and the broken housing market* (19 June 2019) (accessed 7 September 2019).
[7] Home Builders Federation, *The Economic Footprint of UK House Building*, (March 2015) (accessed 16 August 2019)
[8] IPSOS Mori, *Public: "Give housing more attention"* (12 August 2019) (accessed 17 September 2019).

Across the three evidence sessions in England, Scotland and Wales, longstanding policy oversights were acknowledged with witnesses speaking on the need for government to play a greater role in house building. Witnesses agreed that the private sector will not meet the volume or sustainability requirements for housing which the Government has set without intervention. They also highlighted the historical reduction of council post-war housing stock under right-to-buy, along with the failure of government to reinvest these funds into building the next generation of homes.

The housing crisis in the UK has a fundamental and negative effect on our quality of life. A lack of affordable housing is consistently linked to poverty, poor mental and physical health, and poor job prospects by NGOs such as Shelter.[9] There are significant challenges which must be faced to address this crisis, however success in creating a flourishing housing industry, and in turn, a flourishing timber industry, would be felt right across the country - from the Kielder Forest in Northumberland to Shoreham Port, and locally wherever the houses are built.

House building provides an economic boost to local communities as it brings extra jobs, tax revenue for councils, spending in local shops and services by new homes, and investment in local infrastructure. A report from the Home Builders Federation estimates £38bn of economic growth is generated by house building each year in England and Wales,[10] while the economic benefit of each home built in the UK has been estimated as twice the cost of construction.[11]

During this inquiry the APPG for the Timber Industries has identified some possible solutions that will help house building happen by ensuring greater productivity, higher quality and better performance standards in buildings, more job opportunities and stronger local economic growth, all while improving the sustainability of housing in the UK with a reduced carbon footprint.

[9] Shelter, *The Human Cost* (April 2010) (accessed 7 September 2019).
[10] Home Builders Federation, *The Economic Footprint of House Building in England and Wales* (July 2018) (accessed 7 September 2019).
[11] Arcadis, *Building Homes, Making Places* (15 June 2017) (accessed 7 September 2019).

ADVANTAGES OF CONSTRUCTING WITH TIMBER INCLUDE:

- QUICKER CONSTRUCTION
- QUIETER ASSEMBLY
- FEWER DELIVERIES
- FEWER DEFECTS
- COST SAVINGS

HOW THE UK TIMBER INDUSTRY IS TACKLING THE HOUSING CRISIS

During the APPG sessions, witnesses highlighted the contribution of the timber industry to the UK construction sector. This includes employing more than 200,000 people across the supply chain and contributing around £10bn to the economy, with a significant portion of this timber going into new build housing. Witnesses also emphasised the timber industry's investment into innovation, with new technology, treatments, and modified wood increasing the versatility of timber in construction.

Almost every part of a house can be built from timber, whether you look to the stairs, window frames, fittings or fire doors, and through advances in engineering, timber can be made to have a stronger strength to weight ratio than steel.

Timber frame construction was used in almost 30% of new homes in the UK in 2016,[12] up from around two per cent in the 1980s[13], to deliver more than 50,000 houses in the UK that year. This equated to 83% of new housing starts in Scotland, 30.7% in Wales, 22.8% in England and 17.4% in Northern Ireland.[14] Besides speed, the advantages of using these methods for constructing with timber include being quieter to assemble, requiring fewer deliveries, producing fewer defects, [15] and up to 90% less waste.[16] The Structural Timber Association (STA) estimates that currently there is capacity in the timber industry to immediately increase delivery to up to 100,000 timber frame houses per year or greater in the UK, if there were enough demand.[17]

> There is capacity in the industry to immediately increase delivery up to 100,000 timber frame houses per year

Modern Methods of Construction (MMC) have long featured in the timber industry. Timber frames are built using offsite construction methods, providing up to 30% quicker build times than traditional masonry according to the STA.

Recent data from the STA indicates that currently there is a cost saving in projects of two to three per cent when using timber frame. Longer term the wider adoption of MMC, including those which use timber, has the potential to bring about cost savings of 30%. This is due to the speed of construction, quality of build, decreased size of the workforce, and the ability to bulk purchase.[18]

These advantages have been acknowledged by the Royal Institute of Chartered Surveyors who said that timber frames are a "mainstream and intelligent way to build, it presents cost-effectiveness, speed and energy-efficiency advantages from inception to construction".[19] Witnesses at our evidence sessions said these advantages are increasingly being recognised by politicians and the larger home building companies.

[12] Structural Timber Association, *Annual survey of UK structural timber markets* (2016).
[13] Wood for Good, *The Timber Industry Manifesto* (accessed 7 September 2019).
[14] Structural Timber Association, *Annual survey of UK structural timber markets* (2016).
[15] Royal Institute for Chartered Surveyors, *Modern Methods of Construction: A forward-thinking solution to the housing crisis?* (September 2018)
[16] Waste & Resources Action Program (WRAP), Waste Reduction Potential of Offsite Volumetric Construction (accessed 3 July 2019).
[17] Structural Timber Association, *Annual survey of UK structural timber markets* (2016).
[18] Ministry of Housing, Communities and Local Government, *Fixing our broken housing market* (February 2017, (accessed 16 August 2019).
[19] [19] RICS, *Modern Methods of Construction* (September 2018) (accessed 24 June 2019).

During the APPG's Westminster evidence session we heard from witnesses about the development of Cross-Laminated Timber (CLT) which is being used as an alternative to steel in medium to high rise buildings.[20] The UK timber industry was an early innovator, with the first 'tall timber building of the modern age' built in Hackney in 2008.[21] Waugh Thistleton designed and built Murray Grove out of CLT in just 49 weeks, pioneering this exciting new material and showcasing industry innovation.

As well as using engineering to increase the strength of timber, thermal and chemical treatments have been developed that improve the properties of wood, even altering its molecular properties. One of the most developed softwood treatments is acetylation, where acetic anhydride is used to cause a chemical reaction in the plant cell wall, which reduces the wood's reactivity. This process enhances the material's stability, durability and resistance to fungal decay and fire. Witnesses at the sessions expressed the strong desire to work with government to ensure that science and education be kept central to informing building regulation, allowing a safer, better performing, and more productive building system able to make use of innovation in materials and design.

One challenge that the timber industry as a whole has expressed concerns about is the reliability of the Government's pledge to build more homes. In the current political and economic context, the industry has been hesitant to commit to significant expansion without safeguards being put in place to limit the likely risks.[22] The witnesses in our Westminster evidence session emphasised that the lack of clarity over the sustainability of funding meant that developers are cautious about investing in factories, despite the fact that this would be the best way to produce large numbers of homes at scale.[23]

During our Welsh evidence session our witnesses noted that in Wales there are currently small timber frame companies with the potential to expand, but that they were unlikely to do so unless the Government takes action to provide confidence and certainty.[24] Across all three of our evidence sessions we heard from industry experts that without the Government providing greater certainty over future funding streams the private sector is unlikely to make major commitments to expand in the foreseeable future.

Essential to any expansion of the industry will be local government. The Local Government Association continues to seek to bolster council house building by reforming right to buy and retain 100% of sales receipts,[25] and witnesses at the sessions said their engagements with local government and councillors on house building had been positive. Such industry and government partnerships are crucial for delivering more houses throughout the UK.

[20] APPG for the Timber Industries, Westminster Evidence Session (9 July 2019).
[21] Giovanna Dunmall, 'Tall in Timber' in *The Economist* (5 February 2018) (accessed 7 September 2019).
[22] Structural Timber Association, *Timber Frame Manufacture in Wales: Its Capacity and Capability* (March 2019).
[23] APPG for the Timber Industries, Westminster Evidence Session (9 July 2019).
[24] APPG for the Timber Industries, Welsh Evidence Session (11 September 2019).
[25] Local Government Association, *Council Housing 100* (accessed 7 September 2019).

CASE STUDY

ATHLETES VILLAGE | BUILDING 700 HOMES IN 700 DAYS

What was previously a contaminated and disused brownfield site was converted into an eco-friendly village, with 700 homes delivered in just 700 days using Modern Methods of Construction (MMC). Glasgow Council worked with City Legacy and offsite timber frame manufacturers CCG on this project, which is just 3km from the city centre, ahead of the Commonwealth Games.

CCG led the design and construction of 237 of the new homes using their state-of-the-art offsite timber frame construction methods to create accommodation for 6500 athletes and officials. Use of the CCG Offsite Manufacturing (OSM) timber system, which was inclusive of internal wall linings, insulation, service zones, windows and doors, enabled full construction delivery within 15 months.

Twelve house types are spread across the site comprising one or two bedroom apartments, and two-, three- and four-bedroom terraced houses. A 'fabric first' approach to housing design, the use of solar PV panels, and a state-of-the-art heating system contributed to a 95% carbon reduction on 2007 levels, as well as an 'Eco Homes' Very Good rating. Of the 700 homes, 300 are for social rent, in addition to a care home for 120 residents.

Case study: CCG

CASE STUDY

GOLDSMITH STREET | BEAUTIFUL, SUSTAINABLE, AND AFFORDABLE COUNCIL HOUSING

Showcasing what is possible when local government and the construction industry work together, these 105 terraced council homes were awarded the Stirling Prize by the Royal Institute of British Architects, with judges calling it a 'masterpiece'. Goldsmith Street in Norwich was conceived by architectural firm Mikhail Riches with Cathy Hawley and built directly by the council.

These homes are part of a low carbon scheme, with all houses and flats facing South and achieving full 'Passivhaus' Certification. This makes Goldsmith Street the largest social housing scheme in the UK to achieve the Passivhaus standard. The design seeks to provide sunny, light filled homes with very low fuel bills of approximately £150 per year, which is around 70% lower than average.

Built using timber frame and encased in bricks, these houses show that council housing can be efficient, sustainable and beautiful. With the all the homes being rented with secure tenancies at fixed social rent, this project has also been able to achieve remarkable social outcomes to help restore a community, and make an impact on the housing crisis.

Case study: Mikhail Riches

Photograph: Tim Crocker

CASE STUDY

ACCORD | INVESTING IN OUR LOCAL COMMUNITY

One of the largest not-for-profit housing organisations in the Midlands, Accord provides over 13,000 homes and a range of services to over 80,000 people. To better meet a growing need for housing, and in the knowledge that current methods of construction were not sufficient, Accord built its own off-site manufacturing factory in 2011. By the end of 2013, LoCal Homes had produced over 400 homes across five sites, and since has had a continually expanding ambition. Bringing together contractors, developers, housing associations, local authorities and other partners, they have been delivering award winning, low carbon, and environmentally friendly developments across the UK.

By switching to timber from traditional masonry Accord has been producing housing which is well insulated, sound-proof, and reducing the cost of heating for tenants. The success of the factory led to Accord investing £1.1m into a new 56,000 square foot factory, giving LoCal the capacity to manufacture 1,000 homes per year on a single eight hour shift per day. There is capacity to produce up to 3,500 homes if the factory were to run 24 hours. Through the factory LoCal is providing residents better quality housing up to 30% quicker than they could have previously, all the while overcoming skills shortages, producing less than three per cent waste, and providing employment for 14 local people.

Case study: Accord Group

CASE STUDY

LARKHILL | 16 HOUSES EVERY 10 DAYS USING TIMBER FRAME

The Ministry of Defence awarded their relocation scheme at Salisbury Plain to regeneration experts Lovell, involving the construction of over 917 homes across three sites. Offsite timber frame manufacturing was used in order to meet the strict two-year deadline for the project. The construction of the 450 properties at the Larkhill site was divided equally between two timber specialists – Stewart Milne Timber Systems and Taylor Lane Timber Frame – an unusual approach.

The companies set milestones with their speed of build. With a handover rate of 16 houses every 10 days, the fast-track homes project is an industry exemplar and actively promoted by both companies as the future of building. The achievement reached on the Larkhill site was industry-leading – two rival companies building on site at the same time, both in timber frame, both increasing the number of plots built on site from 10 to 16 to meet extraordinary completion deadlines. This shows what can be achieved when a collaborative, transparent and organised approach is taken by both parties.

Case study: Stewart Milne Timber Systems

RECOMMENDATIONS

1. HM Treasury and the Ministry for Housing, Communities and Local Government should make a long-term spending commitment in the next Budget, which reflects its intention to support the building of a million homes by the end of 2020, half a million more by the end of 2022 and 300,000 net additional homes a year on average after that.

2. The Ministry for Housing, Communities and Local Government should ensure that changes to building regulations and policies reflect scientific research so that they do not unnecessarily impede innovation in the construction industry.

3. HM Treasury and the Ministry for Housing, Communities and Local Government should reform Right to Buy to allow 100% retention of sales receipts by local government, ring-fenced for reinvestment in new builds.

TIMBER INDUSTRY IS AT THE FOREFRONT OF CREATING APPRENTICESHIPS IN:

CARPENTRY

JOINERY

WOOD PRODUCT MANUFACTURING

CONSTRUCTION ASSEMBLY

TIMBER FRAME ERECTION STANDARDS

DEVELOPING THE SKILLS WE NEED

Building new homes requires a skilled workforce, and that workforce will need to grow in order to enable the ambitious housing targets to be reached. The 2016 *Farmer Review* identified that there had long been an "underinvestment in training and development, in innovation, in raising productivity"[26] within the construction industry, and that serious skills shortages must be addressed with urgency to enable Government housebuilding targets to be reached.

The Rt Hon Oliver Letwin MP concluded, in his *Independent Review of Build Out* produced for the Secretary of State for Housing, Communities and Local Government, that, without seeking alternatives to current methods of housebuilding an "insufficient supply of bricklayers would be a binding constraint in the immediate future"[27] on the Government's ability to deliver the new homes which the country needs. The Construction Industry Training Board has argued that there would need to be a 40% increase in the home-building workforce by the mid-2020s in order for the Government to reach its housebuilding targets.[28] This equates to 195,000 new skilled workers needing to be trained within the next seven years.

The CITB recognises greater use of MMC will help mitigate some but not all of the effects of this impending skills shortage. Even in a scenario where MMC were to be used in 50% of the 300,000 new builds per year as targeted by 2025, there would still need to be 158,000 new workers.[29] In this scenario, half of these workers would be off-site, which requires the development of new sets of skills. The Government has recognised the importance of moving towards an MMC-led approach to housebuilding, and in its Construction Sector Deal it urged the construction sector to:

"Develop programmes to retrain the workforce with the skills to support the future industry needs to embed and maximise the use of digital technologies and modern methods of construction."[30]

During our Westminster evidence session, we heard about various initiatives from the British Woodworking Federation (BWF). This includes the 'Centre of Excellence', a network of training providers across the regions, and recently BWF relaunched their 'Wow I Made That' campaign and 'Make It' Schools programmes, which are connecting our young people with real companies and career opportunities in the timber industry. Currently the construction industry accounts for 23,000[31] of all apprenticeship starts in the UK.

Through engagement with high-quality apprenticeships, which are engaging and insightful, the timber industry is working to inspire today's students and tomorrow's skilled tradespeople. Over the past year, BWF and the STA have been at the forefront in the creation of new trailblazer apprenticeship standards to provide a consistent pipeline of skilled people, including for carpentry, joinery, and wood product manufacturing, the development of construction assembly, and timber frame erection standards.[32]

Our evidence sessions suggest such investment by industry into the development of apprenticeships needs to be strongly encouraged and supported by the government to overcome the skills shortage. However, an issue highlighted by our witnesses was that employers are having trouble accessing

[26] Mark Farmer, *The Farmer Review of the UK Construction Labour Model: Modernise or Die* (2016) (accessed 2 July 2019).
[27] Rt Hon Sir Oliver Letwin MP, *Independent Review of Build Out*, (accessed 20 June 2019).
[28] Construction Industry Training Board, *The Impact of Modern Methods of Construction on Skills Requirements for Housing* (April 2019) https://www.citb.co.uk/global/research/citb-mmc-report-mar-2019.pdf (accessed 20 September 2019).
[29] Construction Industry Training Board, *The impact of modern methods of construction on the skills requirements for housing* (April 2019) (accessed 20 September 2019).
[30] Department for Business, Energy and Industrial Strategy, *Industrial Strategy: Construction Sector Deal* (2018) (accessed 24 June 2019).
[31] House of Commons Library, Department Apprenticeship Statistics: England – Parliament UK, (accessed 17 October 2019).
[32] APPG for the Timber Industries, Westminster Evidence Session (9 July 2019).

these new standards with the current funding system failing to incentivise colleges towards providing these courses.

The Farmer Review predicted that, due to an ageing workforce, 620,000 people will have retired from the construction industry by 2026. Replacing these workers will require greater efforts by government and industry to both coordinate, consolidate and communicate the opportunities and advantages of working in construction to students, and ensure there is sufficient funding for apprenticeship provision.

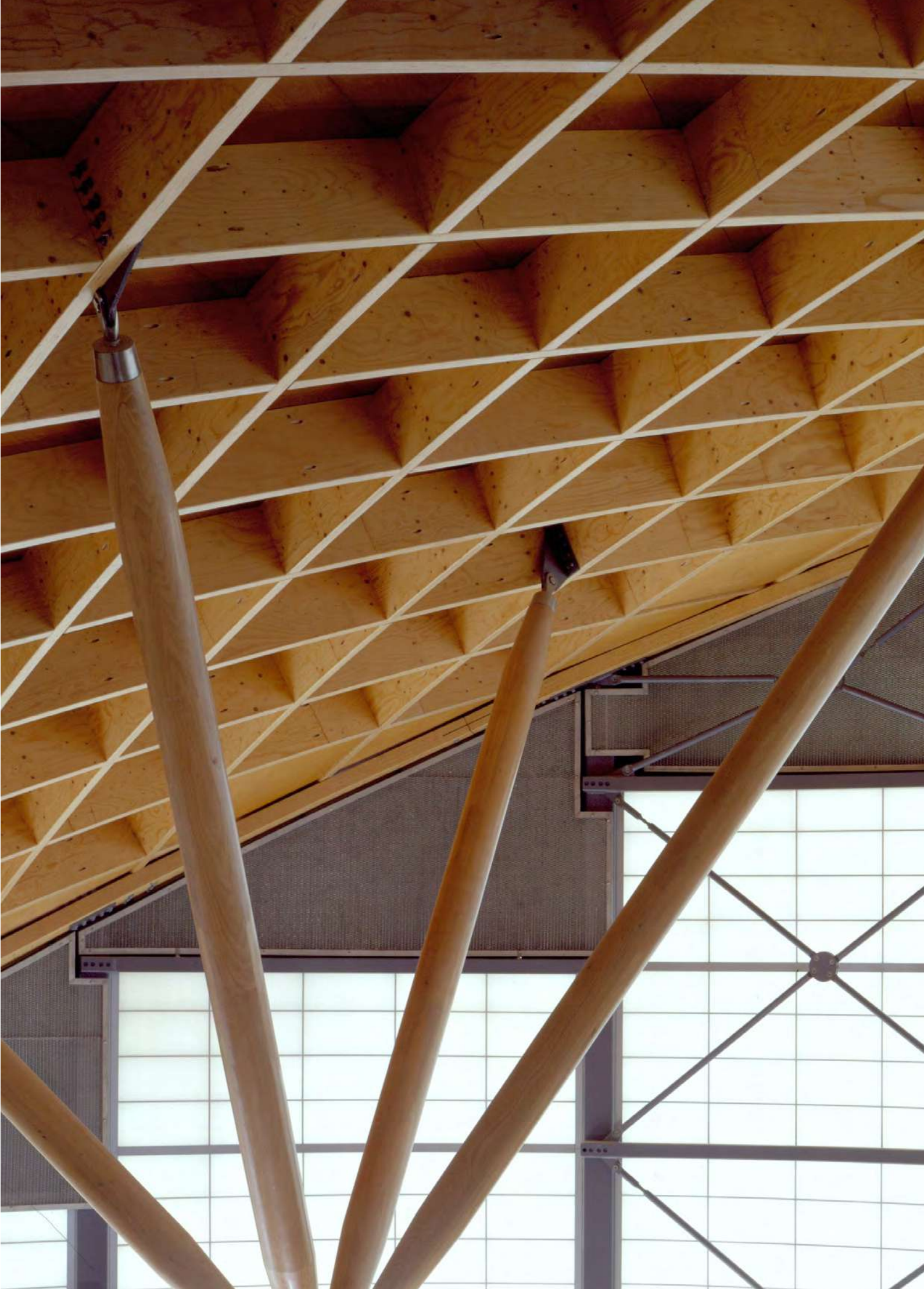
L & Q, London's largest housing association, has an active schools programme to help counter the false perception among students that the construction industry is low-skilled and dangerous, and our witnesses believe there needs to be nationwide action to address this issue further.[33] During our Scottish evidence session our witnesses said that the industry needed to be able to attract "ambitious people looking for a career" but was not yet managing to do so, despite the number of different career paths that the increased technological development of the industry had opened up.[34] For example, Stewart Milne Timber Systems created the UK's first timber frame Building Information Modelling (BIM) library in 2017, a free to use resource providing a range of products such as walls, floors, and roofs amongst designs free to use.

This is just one of several investments Stewart Milne is making into digitisation, automation, and robotics. This transformation of the industry and the industry's movement towards sustainability offers the chance to transform this image.[35]

During our Welsh evidence session it was noted that universities are increasingly offering timber-focused modules within structural engineering programmes, which was welcome, but added that further work was needed to replicate such an approach more widely. Given the rise of the use of CLT it will be necessary for educators to move towards developing a more factory-orientated skill set. Our witness said investment in the industry should in future tie together skills development and technological solutions to tackle productivity issues in the industry.[36] This will require Government, the timber industry and educators to work closely together, or the skills shortage will be felt acutely by the industry in coming years.[37]

Even as the industry invests heavily in recruiting and training young people, there remains a strong need for access to migrant workers. The Home Building Federation has reported almost 20% of workers on house building sites are 'non-UK', and this increases to more than half in London.[38] However, all witnesses agreed the long-term focus of investment should remain on attracting and developing a workforce right here in the UK.

[33] APPG for the Timber Industries, Westminster Evidence Session (9 July 2019).
[34] APPG for the Timber Industries, Scottish Evidence Session (21 August 2019).
[35] APPG for the Timber Industries, Scottish Evidence Session (21 August 2019).
[36] APPG for the Timber Industries, Welsh Evidence Session (11 September 2019).
[37] APPG for the Timber Industries, Welsh Evidence Session (11 September 2019).
[38] Home Builders Federation, *Home Building Workforce Census 2017*, (December 2017) (accessed 7 September 2019).



CASE STUDY

CENTRE OF EXCELLENCE NETWORK | BETTER CAREERS FOR OUR STUDENTS

The Centre of Excellence Network is an initiative set up by the British Woodworking Federation (BWF) to increase access to high-quality, industry-endorsed, and flexible training provision for apprenticeships and other training for the joinery, shopfitting and interior fit out industries.

The Network is made up of further education colleges and private training providers across the UK which are audited by BWF to ensure the training they provide meets the highest government and sector standards, helping to create a pipeline of quality talent with graduates equipped to excel in their careers.

Currently the network includes the Building Crafts College in London, the Leeds College of Building, the Neath Talbot College Group in South Wales, and Didac Limited, which is based out of Bristol and also provides in-house training. This ensures that no matter where someone is in the UK, they have access to world-class education in woodworking.

Case study: British Woodworking Federation

CASE STUDY

RODERICK JAMES ARCHITECTURE | BUILDING A HOUSE FROM THE 'SCHOOL GROUNDS' UP

When it comes to encouraging more students to join the construction industry, Roderick James Architecture (RJA) took a pioneering approach when they built a timber frame house with the students of Burlington Danes Academy in London on school grounds.

Experienced carpenters worked with students from 11 years of age to build a three-bedroom house. Over two years the team worked with the students to show them what is possible with simple woodwork techniques. The house is now used for pastoral care at the school.

The work was initiated and managed by RJA free of charge, together with the Forestry Commission, BSW Sawmills, various charities and building suppliers.

RJA has also since worked to connect ex-offenders with meaningful employment. When ex-offenders are in work, the likelihood of committing further offences can drop by more than nine percent. However, they face many challenges in finding stable work.

A pilot house was built at Lochaline on the West Coast of Scotland with four ex-offenders nominated by the Oswin Project. Since then three of the four have found full time employment with other organisations. Again, this project was initiated and managed by RJA free of charge.

Case study: Roderick James Architecture

CASE STUDY

L&Q ACADEMY | BUILDING OPPORTUNITY AND CONFIDENCE IN OUR COMMUNITIES

L&Q has invested more than £5 million into a new skills academy offering a range of apprenticeships, including carpentry, and already it is making real differences to the lives of their residents, as illustrated by Carolann McFadyen.

Carolann McFadyen is an L&Q resident who began her new career as an apprentice electrician after being encouraged to sign up to a course by an L&Q representative. A single mother who had spent seven years working for a high street chain to support her son, she had always been practical and happy to carry out household jobs such as painting, decorating, plumbing and DIY

When the opportunity arose to sign up for a training programme aimed at L&Q residents, she jumped at the chance to get involved. She passed the course with flying colours and went on to secure a structured apprenticeship programme, again with L&Q in May 2016.

Carolann is currently working on the L&Q site based at Barking Riverside, a brand-new riverfront, mixed-use development in Barking, east London.

She said: “Since I started the apprenticeship I actually look forward to coming in to work every day, and I love all of the guys on site. I’ve never felt intimidated or anything like that, it’s a very supportive atmosphere. I really do love every minute of it.”

John Bryson, Head of the Academy, said: “We are here to support anyone who wants to work in construction, regardless of their background or life circumstances, and are keen to support more women into the industry. Carolann’s success is well deserved.”

Case study: L&Q Group

CASE STUDY

NPTC GROUP OF COLLEGES | BRIDGING THE GAP BETWEEN ONSITE AND CLASSROOM LEARNING

A long-held view has been that industry and academia do not always deliver what both need. One issue identified by both industry and the NPTC Group of Colleges has been that students were being trained to be too general, in terms of capability, to meet the specific needs of the timber trade within the housebuilding sector. However, by working with industry to find new ways to train apprentices onsite on the practical skills which are important to the timber trade, NPTC is overcoming the limitations of college based training to deliver more of the skilled timber trade professionals needed by the sector, and help meet the housing needs of the country.

Working in partnership with house building company Persimmon, NPTC has formed an onsite training partnership which is delivering high quality apprentices who are industry ready to meet housebuilding demand, and more importantly, delivering this training much quicker than previous approaches. Using video observation and recorded evidence sessions, NVQ assessors are monitoring their students' learnings remotely, which allows for more time learning onsite. This process has been found by the students, businesses, and internal and external quality assurance checking as the most effective and efficient method of completing the NVQ qualification.

This novel approach is now being used by NVQ assessors for all their construction apprenticeships which are conducted through the NPTC Group of Colleges in Wales.

Case study: NPTC Group of Colleges

RECOMMENDATIONS

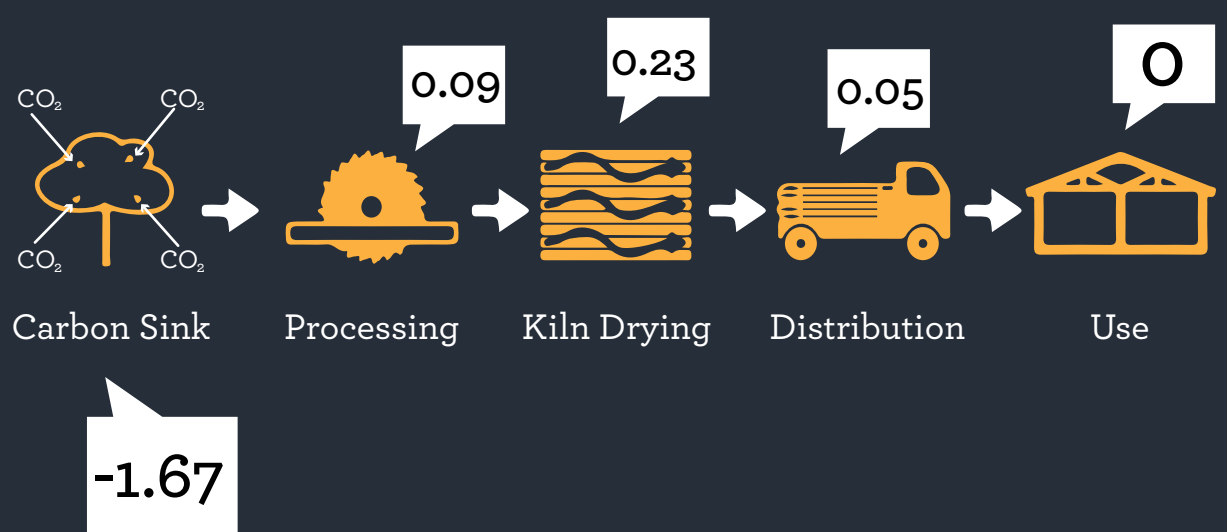
1. The Department for Education and the Department for Business, Energy and Industrial Strategy should work with the construction industry to coordinate, consolidate and communicate the opportunities and advantages of working in construction to students.

2. Local government should incorporate a requirement to employ a minimum number of apprentices and provide a minimum level of training into local planning policy frameworks.

3. The Education and Skills Agency should ensure school leavers have access to apprenticeship programmes relevant to the construction industry and support local employers in accessing apprentices.

TIMBER IS CARBON NEGATIVE CRADLE TO GATE:

kg CO_2e per kg dry wood as consumed in UK 2013



Timber absorbs and stores more carbon than it emits during processing and installation.

SUPPORTING THE GOVERNMENT TO BUILD A ZERO-CARBON FUTURE

Tackling climate change is increasingly seen as a significant priority for Government, and for local government, with a target to become carbon neutral by 2050.[39] According to the UK Green Building Council, construction accounts for around 10% of the UK's carbon dioxide emissions, while heating accounts for another 10%.[40]

For the construction industry to play its part in achieving these goals, we will need to change both how we construct our houses (looking at their 'embodied carbon'), and take steps to improve the energy performance of our homes over their lifetime (their 'operational carbon').

As far back as 2006 the Government had pledged to ensure that all new homes being built should be carbon neutral by 2016.[41] That goal has not yet been met, despite the deadline having passed three years ago. In its recent report, *UK housing: Fit for the future?* the Committee on Climate Change (CCC) highlighted that we cannot meet our housing goals without major improvements in the quality of UK housing.[42] The report said:

"The technology and knowledge to create high quality, low-carbon and resilient homes exists, but current policies and standards are failing to drive either the scale or the pace of change needed... using wood in construction to displace high-carbon materials such as cement and steel is one of the most effective ways to use limited biomass resources to mitigate climate change."[43]

[39] Prime Minister's Office, *PM Theresa May: we will end UK contribution to climate change by 2050* (12 June 2019) (accessed 21 June 2019).
[40] UK Green Building Council, *UKGBC's vision for a sustainable built environment is one that mitigates and adapts to climate change* (accessed 16 August 2019)
[41] House of Commons Library, *Zero Carbon Homes* (April 2016) (accessed 24 June 2019).
[42] Committee on Climate Change, *UK housing: Fit for the future?* (February 2019) (accessed 14 June 2019).
[43] Committee on Climate Change, *UK housing: Fit for the future?* (February 2019) (accessed 14 June 2019).

During our Welsh evidence session we heard that timber is a good material from a sustainability point of view, as it stores carbon and can be used to replace other high-impact materials.[44]

The CCC estimates that if timber were used to build 270,000 new houses, we could increase the amount of carbon stored in UK homes to 3 Mt.[45] This is equivalent to the greenhouse gas emissions which 636,943 vehicles will emit in a year. Research by Heriot Watt University for the Wood Window Alliance in 2013 estimated that using a timber framed window instead of a PVC-U one saves approximately one and a half tonnes of carbon dioxide per home, the equivalent of driving over 5,000 miles in a small family car.[46] The Royal Institute of Chartered Surveyors (RICS) reports that a single five-storey cross-laminated timber (CLT) building can cut carbon emissions by levels equivalent to removing up to 600 cars from the road for a year.[47]

The World Green Building Council has called for embodied carbon to be more widely considered in construction projects, as it is set to become responsible for half of the industry's carbon footprint for new construction by 2050.[48] RICS has published a professional statement on Whole Life Carbon to bring consistency to carbon reporting, which includes embodied carbon, and has made it mandatory for their members.[49] Witnesses at our Welsh evidence session said that there needs to be universal standards for how we measure the whole life carbon output of buildings.[50] Government action to introduce such uniformity would be welcome.

A recent report from the BioComposites Centre at Bangor University found that using timber frames rather than masonry can reduce carbon embodied emissions by around 20% per building. When CLT is chosen in place of concrete structures the effect is even greater, with carbon embodied emissions reduced by around 60%.[51]

Besides absorbing carbon, timber also has a lower environmental impact as it requires far lower energy inputs to produce than competing materials, which reduces the pressure on the UK electricity grid.[52] During the Westminster session, Councillor Vincent Stops noted that the lightweight nature of high-performance timber-based products such as CLT meant they required fewer lorry movements than other materials.[53] Consequently, a benefit of building in timber is that carbon emissions caused by transportation are reduced, along with less dust and associated health issues.

There are examples across the UK where timber is being used more and more as the construction material of choice – for example, the London Borough of Hackney[54] and Powys County Council[55] in Wales both have a 'timber first' approach to their planning policies – but the advice of the CCC to favour timber has not been universally adopted to date.

Another downstream benefit of using more timber in construction is greater opportunities for UK forestry, as it provides an incentive for landowners to opt for forestry over carbon emitting land uses. The CCC recommends planting 30,000 hectares per

[44] APPG for the Timber Industries, Welsh Evidence Session (11 September 2019).
[45] Committee on Climate Change, *UK Housing; Fit for the future?* (February 2019) (accessed 14 June 2019)..
[46] Wood for Good*, The Timber Accord; Growing Our Low Carbon Economy,* (10 October 2014).
[47] Royal Institute for Chartered Surveyors, *Modern Methods of Construction: A forward-thinking solution to the housing crisis?* (September 2018).
[48] World Green Building Council, *Bringing Embodied Carbon Upfront* (September 2019).
[49] Royal Institute for Chartered Surveyors, *Whole Life Carbon Assessment for the Built Environment* (20 November 2017).
[50] APPG for the Timber Industries, Welsh Evidence Session (11 September 2019).
[51] Dr Morwenna Spear et al, *Wood in Construction in the UK: An Analysis of Carbon Abatement Potential* (February 2019) (accessed 15 October 2019).
[52] The Timber Accord, *Growing Our Low Carbon Economy*, (10 October 2014).
[53] APPG for the Timber Industries, Westminster Evidence Session (9 July 2019).
[54] Green Building, *Hackney lead the way on timber building* (10 September 2017) (accessed 21 June 2019)
[55] Woodknowledge Wales, *Hackney's Wood First policy* (accessed 4 July 2019)

year in the UK, but currently the Government is falling far short of this target, with 13,400 hectares planted in the year to March 2019.[56] The last time this many hectares were planted in the UK was in 1989, through the encouragement of the timber industry.[57] While tree-planting in Scotland has surpassed Government targets, tree-planting in England reportedly fell 71% short of Government targets in the year to March 2019.[58] The forthcoming review of the English Forestry Strategy could be an opportunity to stimulate the sector.

A witness at the Scottish session said that there has been a significant increase in UK timber entering the market, thanks largely to tree planting efforts in the 1970s and 1980s – but that these levels have not been sustained.[59] Since this time improved forestry management techniques mean commercial forestry includes a limitation on monocultures to 75%, and a requirement for at least 15% to be native woodland or open spaces, resulting in greater biodiversity in these forests.[60]

During our Welsh evidence session we heard that increased government investment in tree growing and forestry would be beneficial, and that agriculture currently receives significantly more investment in Wales than forestry. [61]

Research shows that in the long-term managed forests will absorb more carbon than unmanaged forests.[62] The UK timber industry has taken a leading role in encouraging sustainable forestry management through responsible trade, partnership, and governance, both at home and abroad. The Timber Trade Federation has a mandatory responsible purchasing policy for members, and supports certification programmes such as FLEGT, FSC and PEFC, along with European Timber Regulations.[63] Such sustainable sourcing allows the timber industry to actively contribute to the reduction of carbon consumption in construction.[64]

[56] Climate Change Commission, *Land Use: Reducing emissions and preparing for climate change* (accessed 7 October 2019)
[57] BBC news, *'Climate change: Tree planting rise 'needs to happen quickly'*, published 30 July 2019 (accessed 7 October 2019)
[58] Guardian, *'Tree-planting in England falls 71% short of government target'*, published 13 June 2019 (accessed 7 October 2019)
[59] APPG for the Timber Industries, Scottish Evidence Session (21 August 2019).
[60] Confor, UK Forestry Standard Guidelines, (accessed 17 October 2019).
[61] APPG for the Timber Industries, Welsh Evidence Session (11 September 2019).
[62] Timo Pukkala, 'Does management improve the carbon balance of forestry?' in *Forestry: An International Journal of Forest Research*, Volume 90, Issue 1, 1 January 2017 (accessed 4 October 2019).
[63] Timber Trade Federation, *Responsible Purchasing Policy* (accessed 4 October 2019).
[64] Wood for Good, *The Timber Accord; Growing Our Low Carbon Economy* (10 October 2014) (accessed 4 October 2019).

CASE STUDY

MURRAY GROVE | SAVING 120 TONNES OF CO_2

When it was built in 2008, Murray Grove in Hackney, London, at nine stories was the world's tallest timber-framed residential building, having been designed and completed in just 49 weeks by Waugh Thistleton - world leaders in Cross-Laminated Timber (CLT) construction.

This project delivered 29 fully insulated and soundproof apartments demonstrating for the first time that CLT has the potential to be a financially viable, environmentally sustainable and beautiful replacement for concrete and steel in high-density housing.

Mechanical ventilation of all rooms includes a heat recovery system that retains 70% of the heat that would normally be lost when return air is expelled, with the building insulated and airtight beyond UK requirements.

Only 111 deliveries of materials were needed during the construction of the building, which is considerably lower compared to a concrete and steel project which would have required over 700 deliveries, reducing the impact on the community.

Waugh Thistleton calculate that as much carbon is stored in the timber frame as would be emitted in CO_2 in operating the building for around 20 years. Even when accounting for the import of some prefabricated timber elements from Austria, there is still a saving of 120 tonnes of CO_2 emissions.

Case study: Waugh Thistleton

Photograph: Will Pryce

CASE STUDY

FUTURE AFFORDABLE, DUNFERMLINE, FIFE | SCOTTISH HOMES BUILT WITH SCOTTISH TREES

A modest terrace of three houses in Dunfermline, Fife, demonstrates a solution to the massive problem of building large numbers of houses which are affordable, efficient and sustainable. Intended for all housing markets - social, rented and private – they meet the requirements of the 2013 Low Carbon & 2016 Zero Carbon targets set by the Scottish Government. The key to their affordability and sustainability is Scottish timber.

Scottish C16 Sitka spruce, one of the most carbon efficient building materials available, is used for the wall, floor and roof structure and also for the services core structure. The timber was Scottish grown FSC certified C16 spruce, primarily supplied by BSW Timber. As it was processed locally, the cost of transport was lower and the Life Cycle Analysis impact was greatly reduced.

These houses were the first example of a new building system 'Future Affordable', a collaboration between David Blaikie Architects, Kraft Architecture, Springfield Properties and Edinburgh Napier University's Centre for Offsite Construction + Innovative Structures (COCIS). The system has been developed for easy adoption by private housing developers and registered landlords.

Case study: BSW Timber

CASE STUDY

LILAC IN LEEDS| BEAUTIFUL, AFFORDABLE, SUSTAINABLE

On the site of an old primary school in Bramley, Leeds, is the UK's first affordable, ecological co-housing project - LILAC. The development of twenty houses and apartments welcomed its first residents in March 2013. LILAC, which stands for Low Impact Living Affordable Community, is a cohousing group who have commissioned the housing with the assistance of the Homes and Communities Agency, the Technology Strategy Board and White Design.

The units use the innovative 'ModCell' bulding system to provide an environmentally sensitive approach to suburban housing which is unique to the UK. The construction is a mixture of timber frame and straw bale structural panels finished in a mixture of lime render and timber, with timber frame internal partitioning. The properties are all super-insulated and airtight, with double glazed windows and solar water heaters installed in each property.

The site arrangement is in a courtyard formation and approximately one third of the site is landscape and allotment gardens, which is used by the residents to reduce their ecological footprint. The number of car spaces is limited to reduce the carbon emissions from the residents and all residents sign a pledge which commits them to the philosophy of the group. The design is contemporary and sets a new standard for both environmental performance and house design in suburban environments.

Case study: White Design

CASE STUDY

NORTH WEST BICESTER | DELIVERING THE FIRST 'ECO TOWN' IN THE UK

The UK's first 'eco town', North West Bicester was built using a 'fabric first' approach to create zero carbon homes. The 393-home project was designed with consideration to all uses of energy and to create zero landfill waste during construction. Offsite timber construction experts Stewart Milne Timber Systems worked with A2Dominion and Willmott Dixon to build 93 of the homes, providing faster build times onsite and a more consistent level of quality through their use of strict factory control processes.

The homes attained Code for Sustainable Homes (CSH) Level 5, the second highest rating available, indicating excellent sustainability as measured by energy and carbon dioxide emissions, water, materials, surface water run-off, waste, pollution, health and wellbeing, management and ecology.

Electricity is generated through solar panels to allow for zero carbon energy, with residents saving an average of £400 compared to their Bicester neighbours.

Case study: Stewart Milne Timber Systems

RECOMMENDATIONS

1. The Ministry for Housing, Communities and Local Government and the Department for Business, Energy and Industrial Strategy should implement the recommendations of the CCC to increase the use of timber in construction.

2. The Ministry for Housing, Communities and Local Government should work with the construction industry to adopt a new framework to enable the rigorous assessment of whole-life carbon in buildings.

3. Local government should incorporate a preference for using the lowest embodied carbon materials into every council's planning policy framework.

GOOD PRACTICE FROM ACROSS EUROPE

Other countries around Europe are embracing timber as their preferred construction material in recognition of the importance of prioritising sustainability. Below we showcase some of the policy actions being taken by Governments in our near neighbours.

Sweden

In Sweden there is a strong historic tradition of building in timber, which in recent years the Government has taken positive action to support. It now permits buildings over two storeys high to be built from timber, which, prior to 2000 was not the case. The Swedish Government also recognises that ensuring low carbon emissions from buildings is important, and from 2021 will require every new building to have its carbon footprint calculated, which it expects will drive increased use of timber.

Estonia

Estonia is the leading exporter of timber housing in Europe. Within the country itself, around 50% of new housing is built from timber, which tends to be a more cost-effective building material compared to alternatives in the country. In Estonia it is well-recognised that timber buildings produce lower carbon emissions than those built from other materials, and as a further advantage, the residues from timber used in construction are used to produce renewable energy. The timber industry as a whole supplies around 50% of central heating and 10% of electricity in Estonia through use of these residues. Government recognition of the usefulness of timber as a construction material has come from the Estonian Ministry of Environment, which is building its new, 15,000m³ building entirely from timber.

Belgium

The proportion of new homes built from timber is increasing rapidly in Belgium and now sits at 11%, up from 6.5% in 2011. The environmental benefits of building using timber are becoming better known as a result of campaigns such as “Hout geeft zuurstof” (wood gives oxygen) and a Government drive towards supporting the use of sustainable materials such as timber and a focus on using natural rather than manmade materials.

CONCLUSION

Solving the housing crisis is not an easy task. The political will to do so is there, but this needs to be matched by significant financial investment and releasing policy constraints which, as things stand, limit the ability of politicians, civil servants and the construction industry to take the action needed to build sufficient new homes. Tackling the housing challenge requires creativity and recognition that traditional methods of construction alone cannot be the solution.

Increasing the number of homes built each year using timber could significantly help the Government to reach its housing targets. Implementing the recommendations in this report is essential in order to provide the timber industry with the stability it needs to build more. We have designed our recommendations to ensure that reaching the Government's goals on housebuilding both supports the development of skills within the construction industry and helps to reduce the UK's carbon footprint.

Over the coming months, the officers and secretariat of the APPG will be seeking meetings with Ministers and local government leaders to explore how we could work together to implement these recommendations. The APPG will publish an update on the progress made against each one in April 2020.

THE GOVERNMENT SHOULD...

1. HM Treasury and the Ministry for Housing, Communities and Local Government should make a long-term spending commitment in the next Budget, which reflects its intention to support the building of a million homes by the end of 2020, half a million more by the end of 2022 and 300,000 net additional homes a year on average after that.

2. The Ministry for Housing, Communities and Local Government should ensure that changes to building regulations and policies reflect scientific research so that they do not unnecessarily impede innovation in the construction industry.

3. HM Treasury and the Ministry for Housing, Communities and Local Government should reform Right to Buy to allow 100% retention of sales receipts by local government, ring-fenced for reinvestment in new builds.

4. The Department for Education and the Department for Business, Energy and Industrial Strategy should work with the construction industry to coordinate, consolidate and communicate the opportunities and advantages of working in construction to students.

5. The Education and Skills Agency should ensure school leavers have access to apprenticeship programmes relevant to the construction industry and support local employers in accessing apprentices.

6. The Ministry for Housing, Communities and Local Government and the Department for Business, Energy and Industrial Strategy should implement the recommendations of the CCC to increase the use of timber in construction.

7. The Ministry for Housing, Communities and Local Government should work with the construction industry to adopt a new framework to enable the rigorous assessment of whole-life carbon in buildings.

LOCAL GOVERNMENT SHOULD...

1. Local government should incorporate a requirement to employ a minimum number of apprentices and provide a minimum level of training into local planning policy frameworks.

2. Local government should incorporate a preference for using the lowest embodied carbon materials into every council's planning policy framework.

About the All-Party Parliamentary Group for the Timber Industries

The All-Party Parliamentary Group (APPG) for the Timber Industries was established in 2016 to help grow the use of timber and develop vibrant timber based industries across the whole supply chain in the UK. It is chaired by Martin Whitfield MP (Labour) and has three vice-chairs: Chris Elmore MP (Labour), Bill Grant MP (Conservative) and Antoinette Sandbach MP (Independent).

The APPG secretariat is provided by the Confederation of Timber Industries, the umbrella organisation bringing together every aspect of the timber supply chain. It represents producers, manufacturers and distributors of timber and wood-based products across the UK.

ABOUT THIS INQUIRY

The All-Party Parliamentary Group for the Timber Industries (APPG) launched this inquiry in 2019 with the intention of ultimately producing a report exploring how the timber industry can contribute towards solving the housing crisis, with the intention of examining the following issues:

- How is the timber industry helping to tackle the housing crisis?
- What skills challenges is the timber industry facing?
- How can we ensure new housebuilding programmes do not undermine Government efforts to tackle climate change?

To aid the APPG officers in their research, they took evidence from the following witnesses during three oral evidence sessions over the course of summer 2019:

- **Tuesday 9th July, 10am, Portcullis House, Westminster:** Cllr Vincent Stops, London Borough of Hackney, Anthony Thistleton, Waugh Thistleton Architects Ltd; Ian Millard, Technical Director, L&Q
- **Wednesday 21st August, Queen Margaret University, Edinburgh:** Hamish Macleod, BSW; Alex Goodfellow, Group Managing Director, Stewart Milne Group; Peter Smith, Roderick James Architects; Professor Robert Hairstans, Edinburgh Napier University.
- **Wednesday 11th September, Welsh conference call:** Wyn Prichard, Director, Neath Port Talbot College Group; Dr Morwenna Spear, The BioComposites Centre, Bangor University; Gary Newman, Wood Knowledge Wales; Dr Andrew Norton, Director, Renuables.

In addition, timber trade associations from around the world were invited to share examples of good practice which related to the key questions above. This report draws on the evidence provided at the evidence sessions, through the international consultation and desk-based research.