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# Construction methods: offsite manufacturing for quicker, greener regen

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# Construction methods: encouraging offsite manufacturing for quicker, greener regen

## Why

Without the tools and resources to build, we cannot create the new economy.

## The failing

We have not encouraged any new building types, nor any form of real innovation in construction. Current government aid falls well short of the kick-start the sector needs while current private sector business practices are prehistoric.

## Policy recommendations

I. Prioritising off-site manufacturing: Fast-tracking housing built in factories can be led by radical interventions from Homes England but this requires the Treasury to better support investment into factories, requiring a longer term perspective. We need a presumption in favour of sustainable offsite development and a mandate that a minimum percentage of public land is developed using MMC. Homes England should be supported by Treasury to use the full weight of powers it already has to grant planning consent and be progressive in supporting offsite manufacturing

- Encourage local authorities to allocate land without planning to OSM builders that can create accurate costings before the site goes to market (set up national agency to aid with planning and procurement)
- Create a tax break for housing associations that use OSM for sites, enabling cost efficiency at the beginning
- Found new schools of architecture construction techniques around OSM – or encourage universities to specialise in this subject

### Author

**David Sheridan**
Executive Chairman, ilke Homes

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# Turning the process on its head

Modular housing will add stability to the delay-prone UK house building process. Sites can be built out in half the time, with fewer delays due to weather or supply chains, and the housing quality is far superior to that delivered by traditional methods.

However, at the moment set up costs are more expensive. Partly this is down to additional planning costs, because processes are not yet set up to handle OSM – though these will disappear as it becomes commonplace. Creating a factory and housing templates also involves higher start-up costs – though this too fades with time, as consistency of supply and production volumes permit economies of scale. Currently, our own models are cheaper than a standard house in the south of the country, but more expensive in the north. However, we estimate that in 18 months they will be the same price or cheaper everywhere.

But at the moment, because the sector is so new, it is harder to garner the investment required to create the necessary scale.

This is the main reason more operators have not emerged yet. But there are simple ways to enable more and ease the construction crisis, while providing thousands of new jobs in the former industrial heartlands and creating high quality homes quickly.

### Costing sites sensibly

Firstly, we should turn the development process on its head.

Imagine a site of 500 homes. Instead of selling that to a developer, who spends years getting planning and making estimates, before finally approaching a contractor and finding out the actual build price - start with the builder.

Allocate a site to an OSM manufacturer, with outline planning for how many homes needed and the unit mix. From that they can work out the development solution, build cost and time needed. Then the authority should go to market to find the developer and get planning, with accurate estimates of price and timing for units.

It turns procurement on its head, but it would guarantee supply, stop the sweating of land value, and increase build out rates throughout the UK.

If we were being particularly bold, we would allocate strategic sites to be developed through MMC and appoint Homes England as match-marker – going out to the market with unit cost and build out rates already there.

### Rebranding MMC as a new industry

We should also be asking for government funding, or assistance through tax breaks, to support the growth of MMC capacity in the UK.

We are creating factories that build houses, much like a car plant that builds cars. Local authorities and government are usually eager to bring factories and jobs to an area, but currently they think of an MMC as an extension of house building, not as a new form of manufacturing.

But once we reach capacity, we will be employing 850 people a year at our Knaresborough factory, full time, with decent salaries. We are proposing the Nissans or BMWs of house building.

Support doesn't need to be through direct government aid. We could do it through housing associations, who want to build out faster, and can guarantee demand even during downturns. If there is a cost differential, a tax discount for housing associations could make it work.

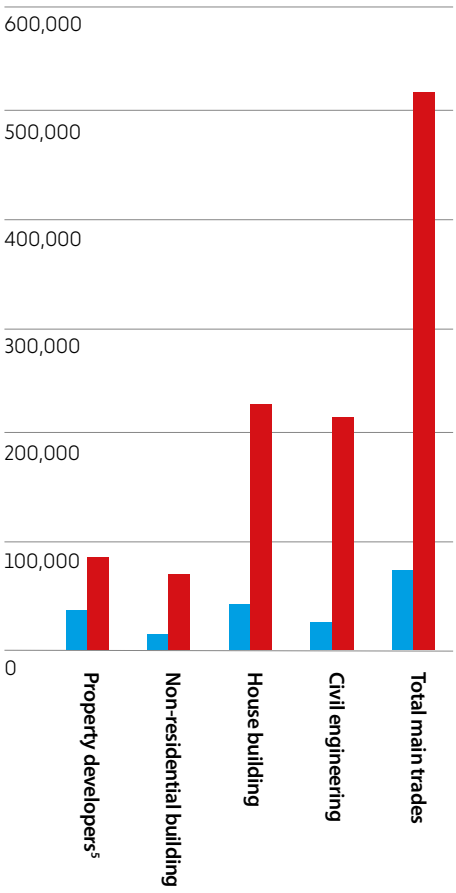
### Thinking big

When the UK leaves the EU, there is already the threat of an employment crisis in the construction sector that will worsen the growing skills shortage. MMC will help alleviate that. If we are serious about upping housing construction, OSM is also the way to increase supply and smooth out the current instabilities plaguing the market.

But we can think bigger than that. If we can transport homes all over the UK, why not abroad?

This report is looking at making the UK a global player again in the knowledge economy – but also in new forms of manufacturing. With the right ideas now, just as we did with cars in the 50s, future decades could see UK manufacturing shipped all across Europe again - of high quality homes.

## Change in R&D spending




Source: ONS

## Change in R&D spending data

**Firms and employment by sector (2017)**

| | Number of firms by sector | Employment |
|---|---|---|
| Property developers | 36403 | 86,100 |
| Non-residential building | 13330 | 70,100 |
| House building | 40539 | 227,000 |
| Civil engineering | 23818 | 215,600 |
| **Total main trades** | **77687** | **512,700** |

Source: ONS

**Firms and employment by region (2017)**

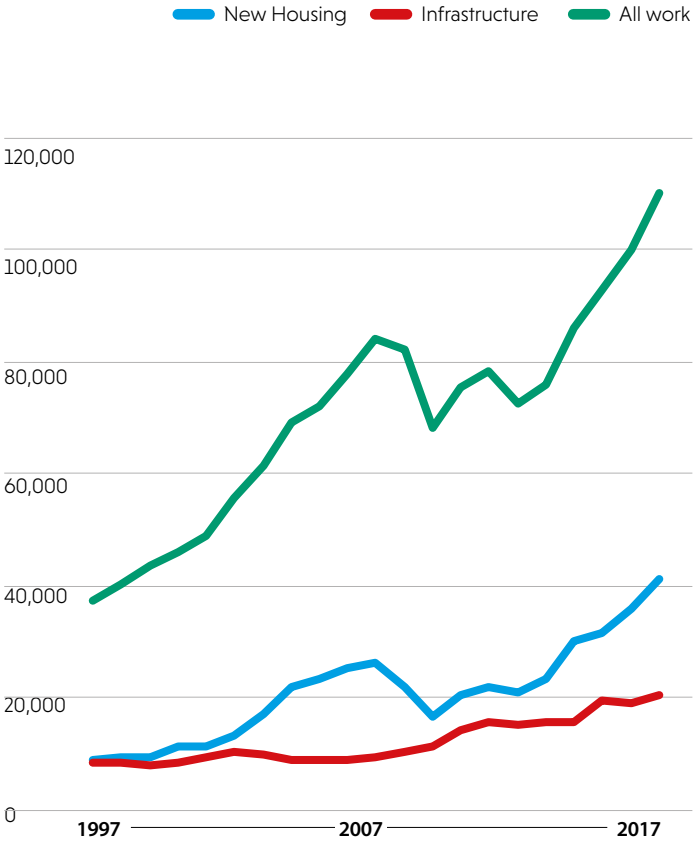
| | Number of businesses by region | Employment by region |
|---|---|---|
| North East | 8,722 | 42,200 |
| North West | 29,408 | 160,900 |
| Yorkshire and the Humber | 22,927 | 103,700 |
| East Midlands | 22,494 | 84,700 |
| West Midlands | 24,377 | 100,500 |
| East | 39,448 | 149,300 |
| Greater London | 50,722 | 182,300 |
| South East | 53,456 | 202,700 |
| South West | 30,377 | 112,300 |
| England | 281,931 | 1,138,600 |

Source: ONS

## Value of the construction industry by sector (£m)

| Year | New Housing | Infrastructure | All work | All new work annual growth |
|---|---|---|---|---|
| 1997 | 8,587 | 7,953 | 36770 | 8.6% |
| 1998 | 9027 | 7,703 | 39715 | 10.8% |
| 1999 | 8903 | 7,610 | 43163 | -5.1% |
| 2000 | 10,550 | 7,941 | 45680 | 7.8% |
| 2001 | 10,813 | 8,814 | 48575 | 5.4% |
| 2002 | 12,864 | 10,033 | 54956 | 12.7% |
| 2003 | 16,723 | 9,333 | 60993 | 1.6% |
| 2004 | 21,187 | 8,243 | 68786 | 15.1% |
| 2005 | 22,966 | 8,241 | 71504 | 12.4% |
| 2006 | 24,618 | 8,178 | 77272 | 8.7% |
| 2007 | 25,626 | 8,642 | 83457 | 6.0% |
| 2008 | 21,437 | 9,715 | 81667 | -17.8% |
| 2009 | 15,919 | 10,738 | 67586 | -18.8% |
| 2010 | 19,732 | 13,540 | 74905 | 3.1% |
| 2011 | 21,322 | 15,320 | 77590 | -12.3% |
| 2012 | 20,432 | 14,426 | 72172 | 5.5% |
| 2013 | 22,722 | 15,333 | 75492 | 14.8% |
| 2014 | 29,407 | 15,325 | 85240 | 6.1% |
| 2015 | 31,190 | 18,811 | 92257 | 6.2% |
| 2016 | 35,404 | 18,403 | 99448 | 5.5% |
| 2017 | 40,700 | 19,727 | 109387 | 7.4% |

Source: ONS



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## Contributor

**Tony Dicarlo**
**Managing Director, Innerspace**

# Weighting the NPPF to offsite and sustainable

Innerspace is a relatively new entrant to the UK housing market, building highly sustainable design-led modular homes. Typically, its homes have a carbon footprint and annual energy usage 60% below current building regulations Part L. According to chief executive Tony Dicarlo, the intention is to be producing zero carbon homes within a few years.

"The core of the brand is design-led houses that benefit people and the planet," he says.

It is also one of only three developers in the UK that has and uses its own branded modular home system to build all its houses. For Innerspace, OSM offers stability and predictability in the development and procurement process.

"Offsite is an enabler for us to build better, more fuel-efficient homes with reduced risk and environmental impact," says Dicarlo.

"Yes, it makes the shell more airtight, but offsite for us is systemising to reduce risk, so we have more control over our supply chain, budget and programme."

However, the planning system has struggled to recognise the benefits of either its modular or highly sustainable homes, owing to lack of flexibility or even recognition, which has caused delays.

"There is no recognition of OSM or support or promotion of either OSM or highly sustainable development through the planning system" says Dicarlo.

"By being adopted as policy within the NPPF, OSM and highly sustainable development should be favourably weighted in amongst planners' wider considerations.

"A simple inclusion of a new section (G) into 127 of the NPPF that allows for the support, encouragement and promotion of highly sustainable developments and/or developments with a certain level of pre-manufactured value off-site, would give it priority at a national level which would filter policy down to local plans."

Dicarlo says "by being recognised and weighted in the system, there would be considerably more chance of getting planning permission for sustainable housing built off-site, which could lead to a huge lift off in OSM and highly sustainable development. House builders would win; the environment would win; local stakeholders would win"

### Q&A: How can Britain get off-site manufacturing off the leash?

**Sam Lenehan, Associate Director of House, Urban Splash**

**Urban Splash recently secured a £90m investment deal with Homes England and Japanese house builders Sekisui House. What was the main driver for the partnership?**

At Urban Splash, we have spent the last seven years developing our core product; Town House. These are modular housing products built using volumetric MMC, manufactured at our factory in Alfreton. We felt confident that we had a great product, which with the backdrop of the housing crisis, could be rolled out on a large scale, providing a quality alternative to the traditional new-build housing market.

The main obstacle to that expansion had been a lack of capital, which makes it hard to outcompete larger traditional house builders on land acquisition. We'd often go into conversation with public sector partners desperate to work with us, and make it to the final two or three developers in the running – but then lose out at the final stage, because we didn't have the cash reserves to outbid the competition.

This prompted our search for a partner and led us to Homes England and Sekisui House. It's given us a unique opportunity to bring together three very different organisations, that have real alignment in targets, objectives and culture. Sekisui House, as well as being one of Japan's largest house builders and the largest MMC housing developer in the world, was looking at entering the European market, and wanted a local partner in the region with a strong brand, similar cultural philosophy and knowledge of the market. Homes England wants to catalyse growth and disruption in volume house building and is particularly keen to support SME MMC house builders to that end. Both of these goals lined up perfectly with our need for sponsorship, and the icing on the cake was Sekisui House's OSM know-how. They build roughly 46,000 homes a year, mostly from their Japanese factories, which all use panellised MMC. So as well as capital, they offered valuable expertise in off site construction.

**To what extent is a lack of investment holding back MMC house builders?**

Compared with other industries, the construction sector hasn't historically invested much in R&D. Most developers deliver via contractors, which has left responsibility for innovation on construction methods to firms with typically narrow margins and little to spare for R&D. It's no wonder that despite breathtaking technological leaps in most other fields, we still largely build homes the way we did 50 years ago.

Plugging that multi-generational deficit in R&D investment has fallen on the backs of MMC developers alone, and will take time to yield generational leaps in productivity and economies of scale. That's an overhead that traditional competitors don't have, and can allocate towards land acquisition. Without large capital reserves, SME OSM developers are at all the more disadvantage.

*The core of the brand is design-led houses that benefit people and the planet,*

**Tony Dicarlo**
**Innerspace**

**What could government and planning authorities do to lower those barriers to entry for OSM house builders?**

If we want our communities to capitalise on innovation, we need to set the rules in a way that incentivises bidding developers to invest in it. The planning system needs to see MMC as a positive, as does the public sector, when it comes to the sale of land.

Momentum is building, but MMC is still growing relatively slowly. OSM developers are having to take the long road of establishing proof of concept – spending years to win a bid for one site, working for several more to prove its viability beyond doubt, and only then being able to start others. If we're happy for MMC to be a 10 to 15 year growth story, fine. But if we want to speed things up, the planning system needs to incentivise MMC adoption in procurement rather than just looking at the bottom line figure.

**Has OSM evolved enough to be a widespread solution for UK housing, or is that likely contributing to the planning hurdles it's facing?**

OSM has evolved enough to deliver on a wide scale in its own right. At Urban Splash, our target is to deliver 2,000 homes a year within the next five years, reaching the benchmark of providing 1% of the annual national house building target as a firm. We believe that is eminently achievable. The main barrier now is education.

We are starting to see planner complaints that MMC schemes are repetitive. We need to challenge the idea that there is something necessarily wrong with houses being the same, if they are all designed to a high quality and serve residents' needs. Some of the greatest streetscapes in the most high value areas of the country – Knightsbridge, Bath's Royal Crescent – are made up of houses that are all designed identically.

This relates to the frequent misconception that MMC is about doing things cheaply and quickly, or that it's a fad. There is work to be done to help people understand that it's ultimately about better quality and flexibility of design. Manufacturing is seen as the only way of doing things in almost every sector already, except for housing. Why should the biggest and most important purchase most people ever make be the exception?

Understanding of MMC's potential is all too often restricted to its time and eventual cost savings. That overlooks its huge promise in terms of regeneration, in the opportunities it offers our education system in sparking collaboration between developers and universities, the benefits it could yield for public health in helping to create model towns and communities, and the job creation it can stoke in communities that have relied on declining industries.

To reach the point where it is just as important as traditional house building in the market, MMC will need nurturing.

Partnering with Sekisui House, who now has several members of its team working with us in the UK, has given us access to their methods and insight. Visiting their factories and R&D facilities in Japan, we've experienced the wow moment of seeing what MMC can be when it has been given proper investment, and where the planning system, public sector policy and private sector innovation are all aligned. The true winners of that planning system are the people living in those homes at the end, and that's what matters.