Gathering21

Construction Innovations
for Future Generations

CitA

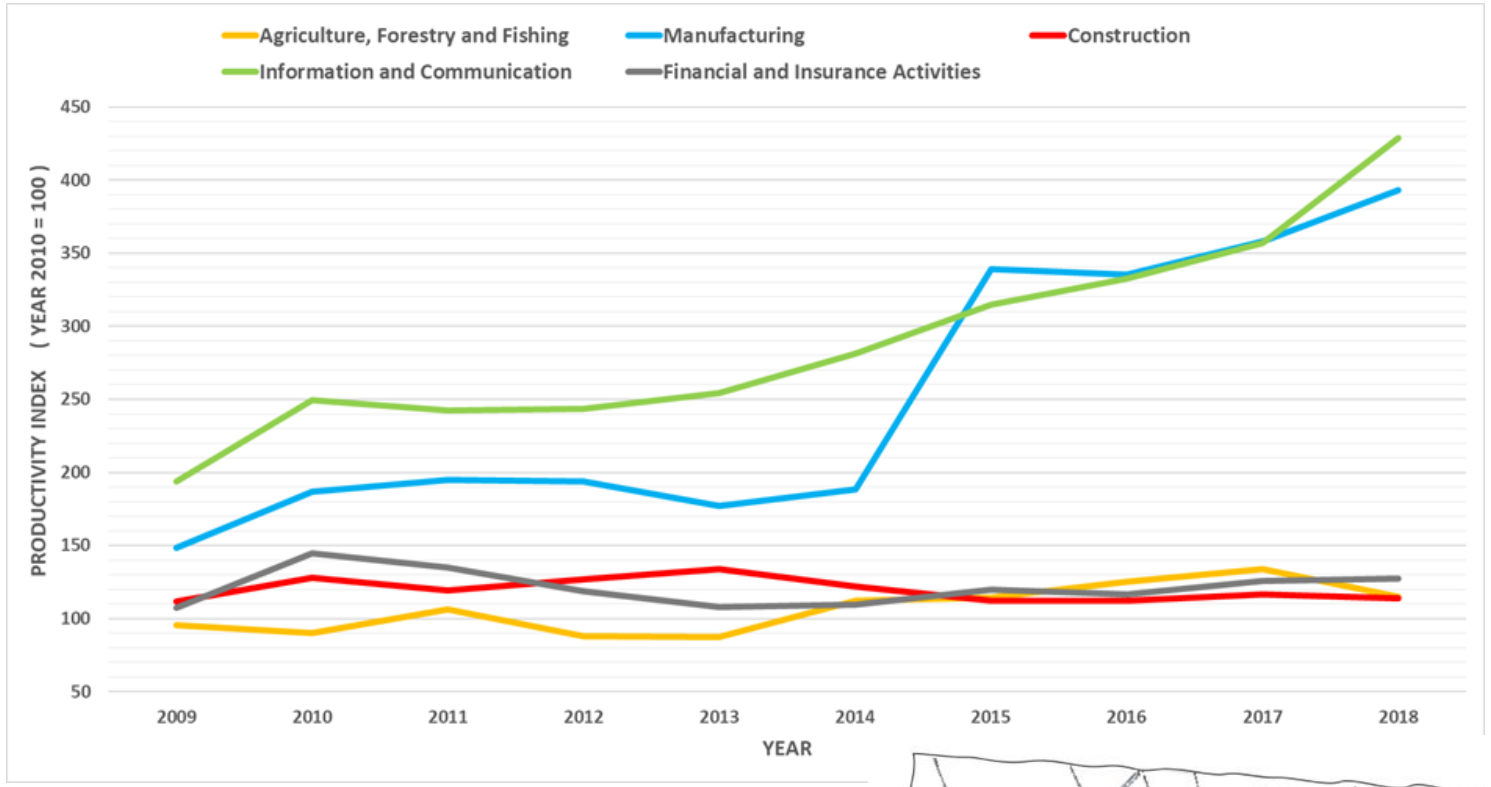
MODERN METHODS OF CONSTRUCTION

A DRIVER FOR INCREASED LEVELS OF OUTPUT IN THE IRISH RESIDENTIAL MARKET

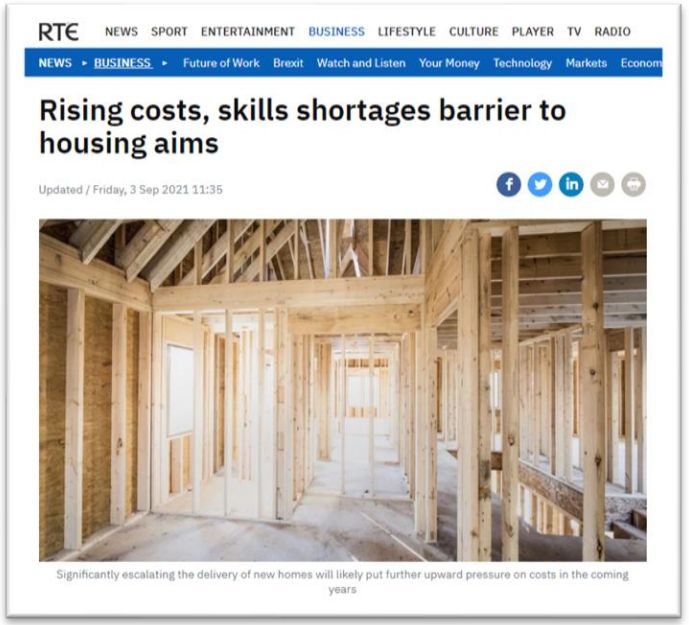
5th CitA BIM Gathering Virtual Conference

21 - 23 September 2021

Challenges Facing The Construction Industry



Productivity in the Irish Economy
Source: Irish Central Statistics Office

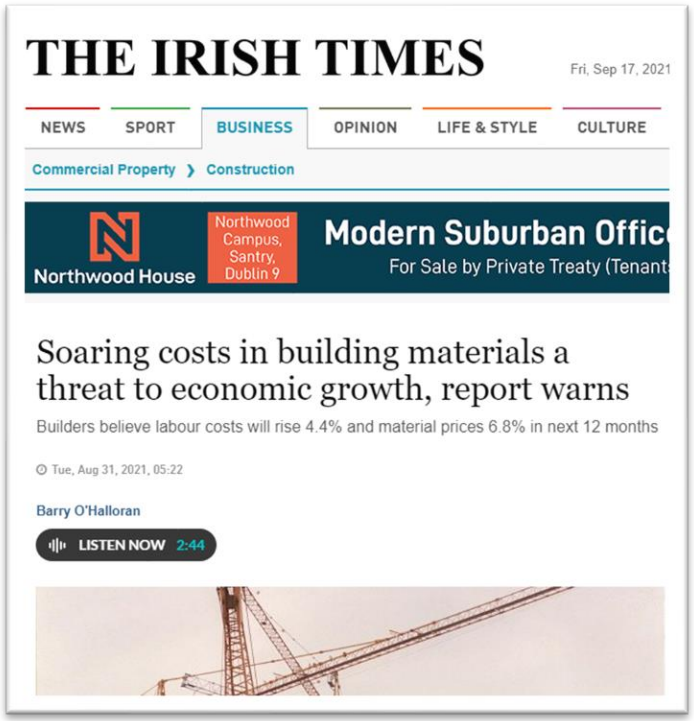

RTE NEWS SPORT ENTERTAINMENT BUSINESS LIFESTYLE CULTURE PLAYER TV RADIO

NEWS ▸ BUSINESS ▸ Future of Work Brexit Watch and Listen Your Money Technology Markets Econom

Rising costs, skills shortages barrier to housing aims

Updated / Friday, 3 Sep 2021 11:35

Significantly escalating the delivery of new homes will likely put further upward pressure on costs in the coming years


THE IRISH TIMES

Fri, Sep 17, 2021

NEWS SPORT BUSINESS OPINION LIFE & STYLE CULTURE

Commercial Property › Construction

Northwood House Northwood Campus, Santry, Dublin 9 Modern Suburban Offic For Sale by Private Treaty (Tenant

Soaring costs in building materials a threat to economic growth, report warns

Builders believe labour costs will rise 4.4% and material prices 6.8% in next 12 months

Tue, Aug 31, 2021, 05:22

Barry O'Halloran

LISTEN NOW 2:44

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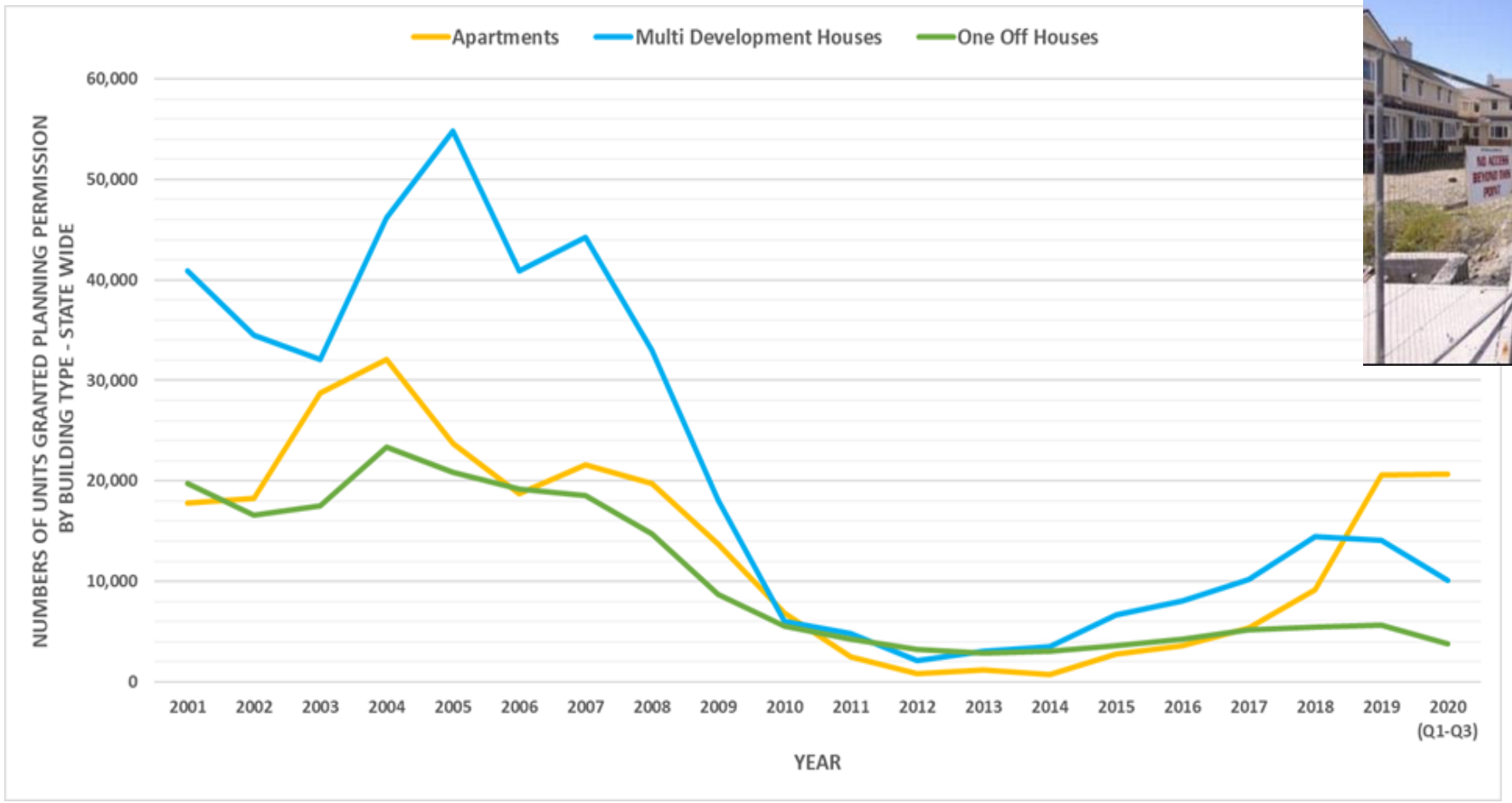
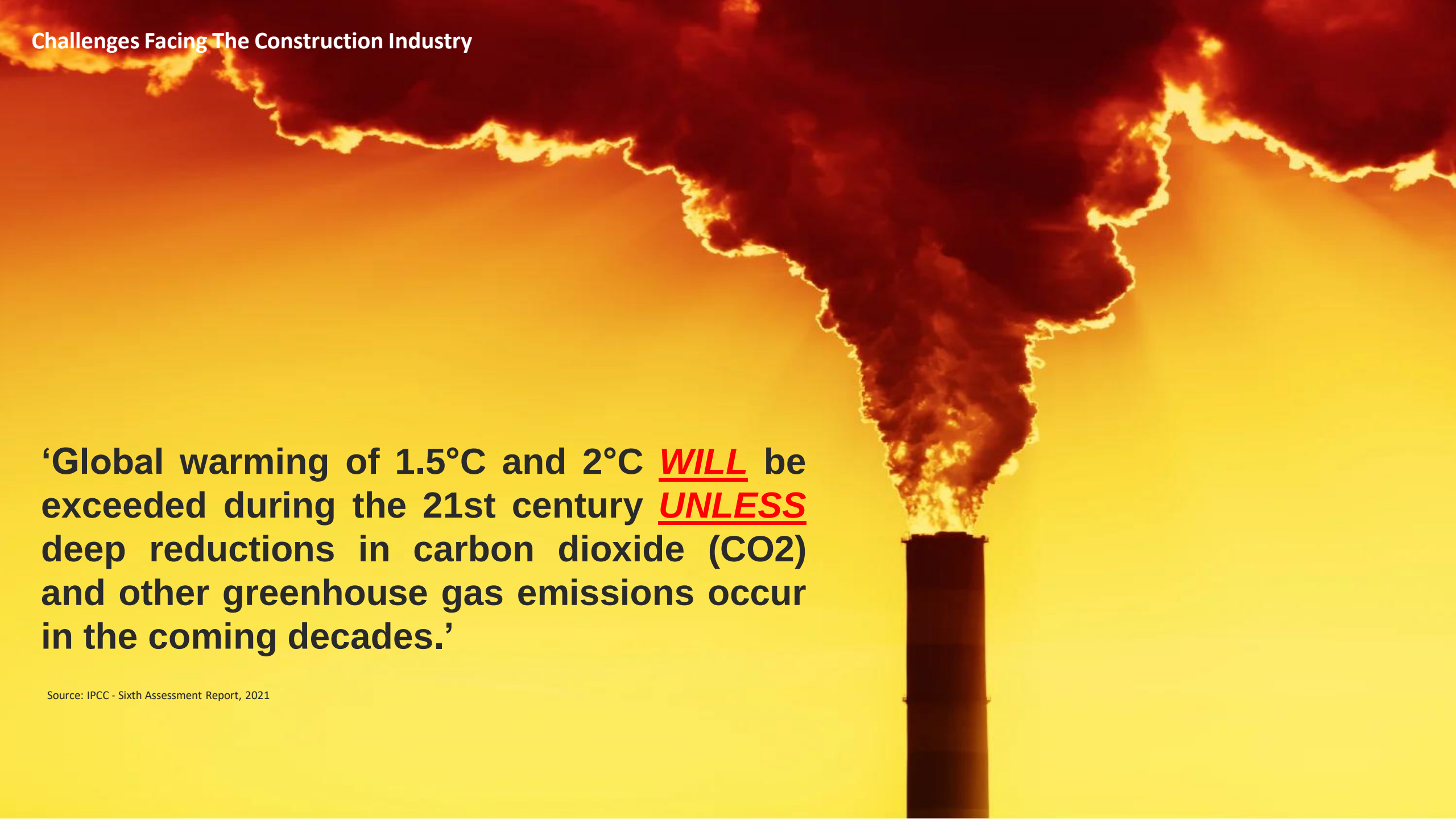
Challenges Facing The Construction Industry



Grant of Planning Permissions by Housing Type
Source: Irish Central Statistics Office

Challenges Facing The Construction Industry

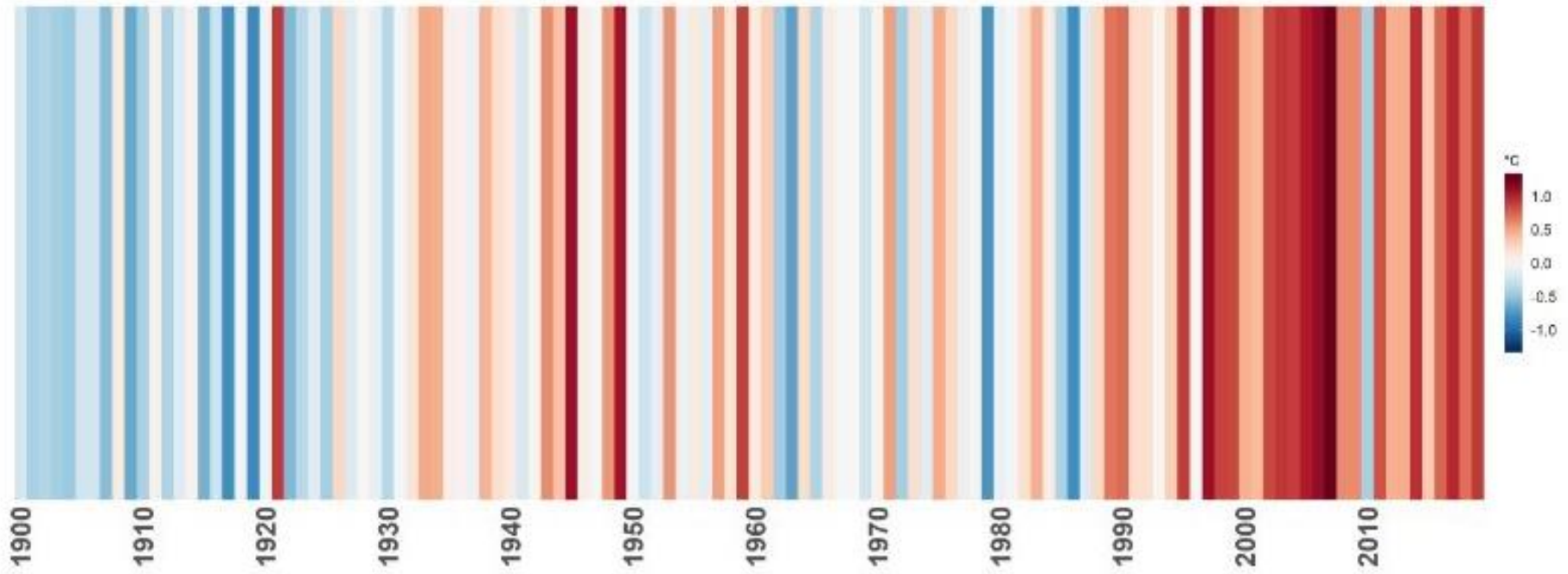


‘Global warming of 1.5°C and 2°C *WILL* be exceeded during the 21st century *UNLESS* deep reductions in carbon dioxide (CO2) and other greenhouse gas emissions occur in the coming decades.’

Source: IPCC - Sixth Assessment Report, 2021

Ireland Mean Surface Air Temperature Anomaly

Baseline: 1961 - 1990

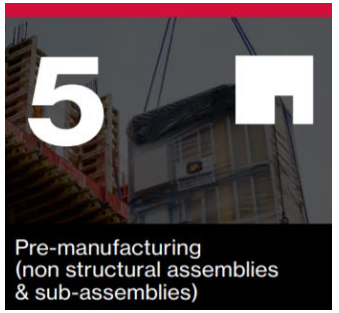


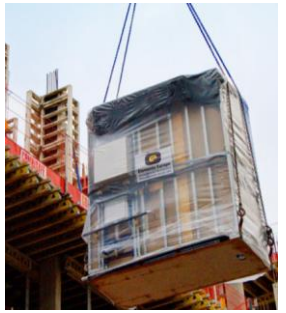
Annual Air Temperature Difference (1900-2019) Compared to the Mean Value Calculated Over the Period 1961 to 1990

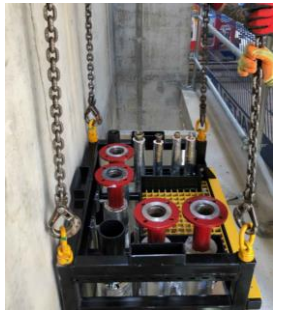
Source: EPA - The Status of Ireland´s Climate 2020, Published August 2021

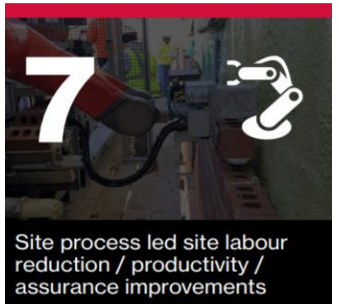
Modern Methods of Construction (MMC)

MMC is a broad term used to describe offsite manufacturing and onsite techniques that provide alternative construction methodologies to traditional building methods.









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Modern Methods of Construction (MMC)

Inventory

Waiting

Defects

Overproduction

Motion

Transportation

Processing

7 Wastes of Lean “Muda”

Modern Methods of Construction (MMC)

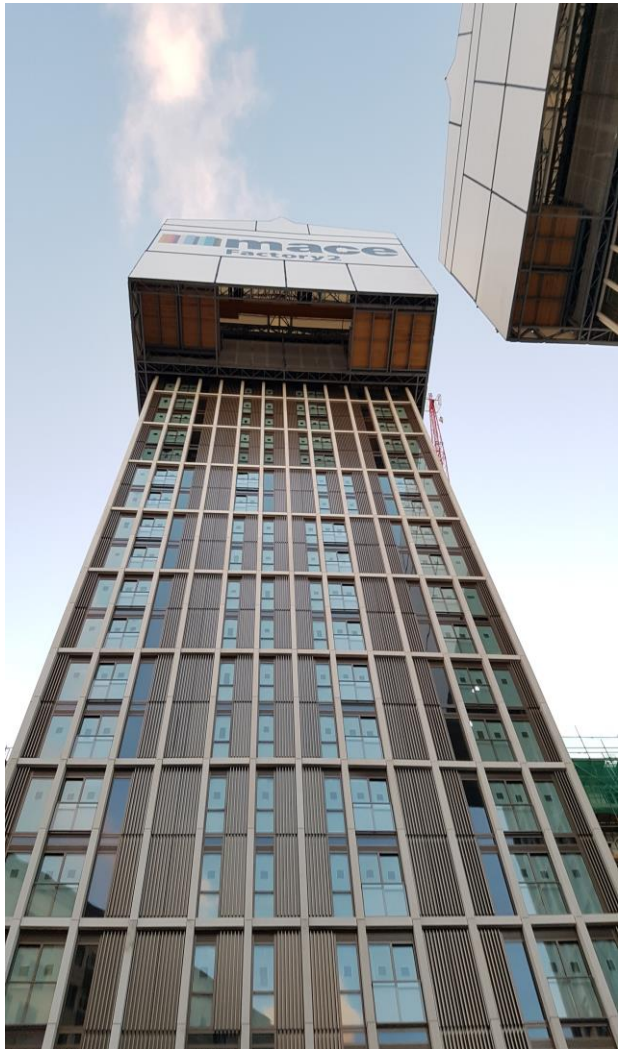
Increased Productivity & Innovation

In most cases, MMC can be carried out independently of ongoing site works, insulating it from issues with onsite construction programmes and project management. Greater programme certainty and increased levels of productivity can be achieved through factory-based production.

Case Study: N08 East Village, Mace Group

Build to Rent Scheme, 482 Apartments across two towers.
Design and Build Contract - £180m.
Delivered in 29 Months (Jan 2016 – May 2019).

Structural Frame constructed from precast concrete. Bathroom, Kitchen Pods and Service Modules used throughout. Full BIM coordination and delivered via a Digital Platform integrated with Supply Chains.



Modern Methods of Construction (MMC)

Reduced Environmental Impact

Case Study: N06 East Village, Mace Group

Build to Rent Scheme, 524 Apartments across two towers. Design and Build Contract - £179m.

Mace anticipates that the project will achieve a 70% reduction in construction waste and transportation of materials will be reduced by at least 40%, combining to achieve a 15% reduction in embodied energy compared to traditionally built projects.

Improved Safety and Health & Wellbeing

The many health and safety risks associated with traditional construction such as working from heights can be alleviated using MMC. Reducing the amount of construction activities on site and moving to a factory-based controlled environment can provide safer working conditions as operatives are shielded from harsh environmental conditions.

Higher Quality

Moving many construction activities to a controlled factory environment improves workflow variability and quality assurance. Standardising manufacturing tasks being carried out on a repetitive basis builds labour skill and offers the ability to optimise processes.

Modern Methods of Construction (MMC)

MSc Dissertation Research – Benefits of MMC Usage

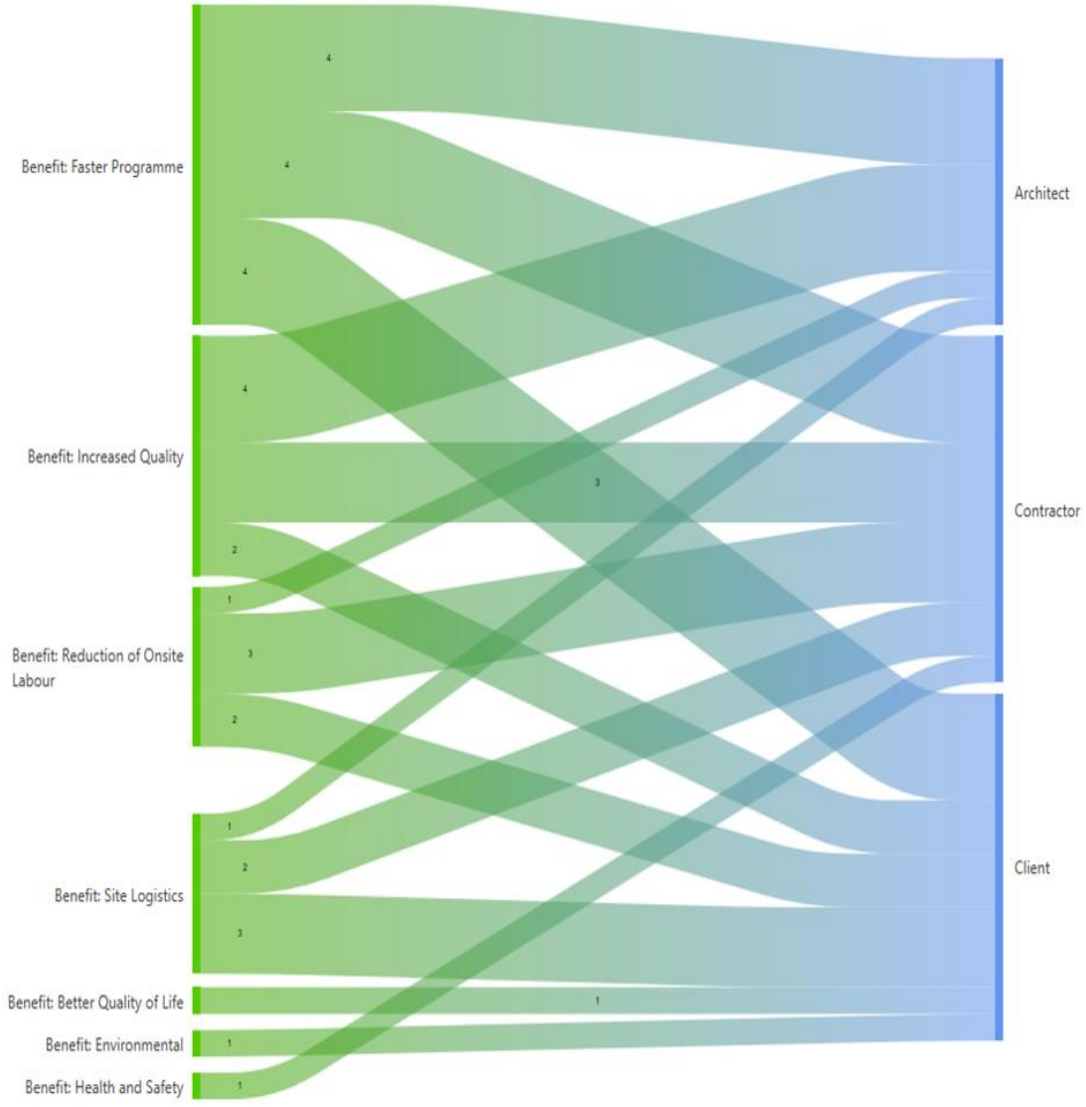
Online Survey Results

Benefits of MMC	Overall	Architecture	Contractor	Client
Increased Levels of Early Design Coordination	1	1	1	1
Improved Productivity	2	2	2	2*
Accelerated Delivery	3	3	4	6*
Better Quality	4	4	3	2*
Increased Levels of BIM Adoption	5	6	5	5
Increased Levels of Site Safety	6	5	6	2*
Improved Levels of Sustainability	7	7	7	6*
Lower Costs	8	8	8	8

Relative Important Index for benefits of MMC adoption

*Represents terms jointly ranked in terms of frequency index within that category of respondents.

Interview Results



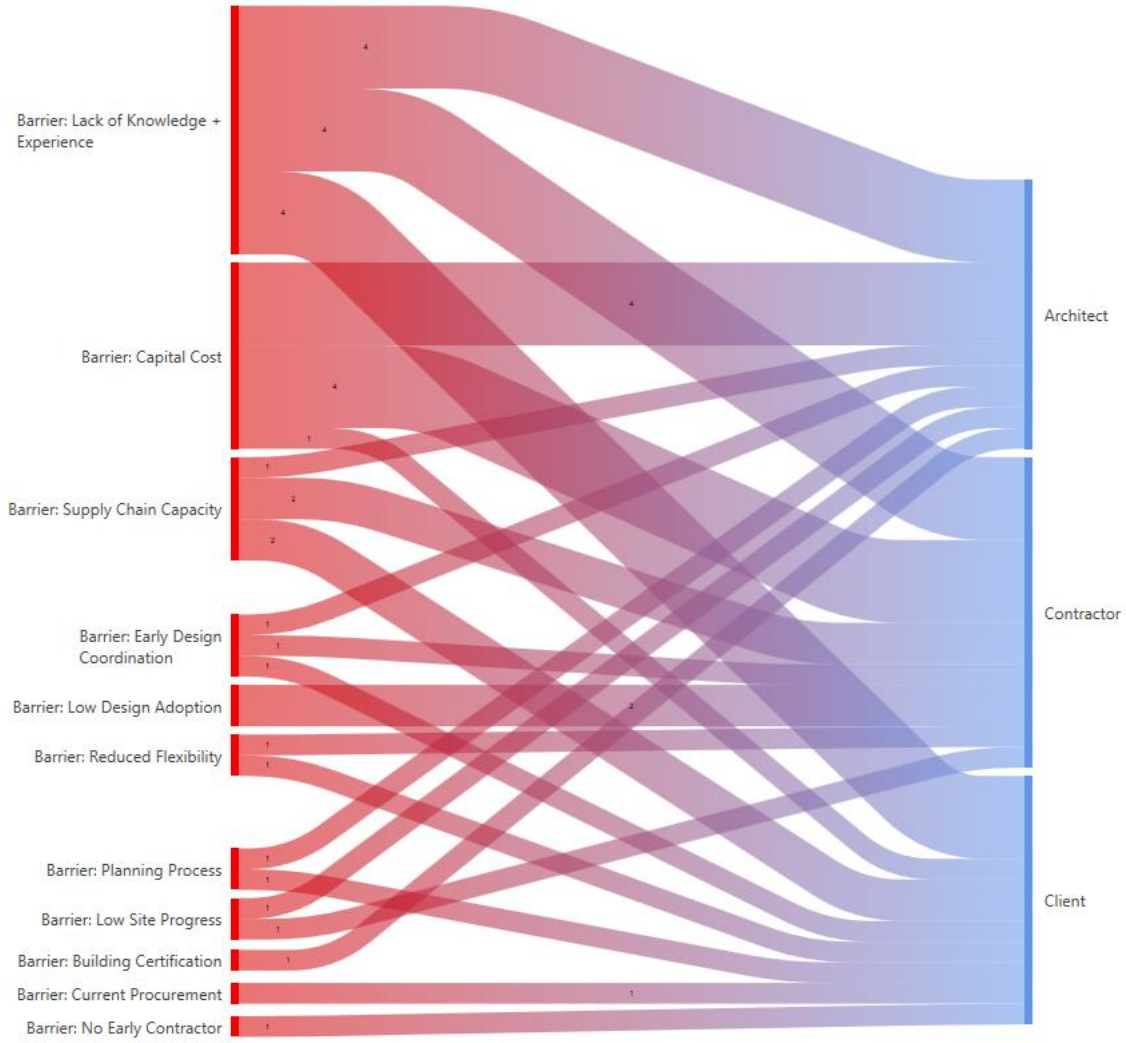
Modern Methods of Construction (MMC)

MSc Dissertation Research – Barriers to MMC Adoption

Online Survey Results

Barriers	Overall	Architecture	Contractor	Client
Lack of Incorporation at Design Stage	1	1	1	3*
Level of Client Awareness of MMC	2	2	2	3*
Skills Shortage	3	4	4*	3*
Project Procurement Methodologies	4	3	6	1*
Low Levels of Virtual Design and Construction	5	6	3	3*
Increased Construction Costs	6	5	4*	1*
Manufacturing / Supply Chain Capacity	7	7	7	7
Planning Permission System	8	9	8	8
Reduced Design Quality	9	8	9	9

Interview Results



Relative Important Index to barriers of MMC adoption.
*Represents terms jointly ranked in terms of frequency index within that category of respondents.

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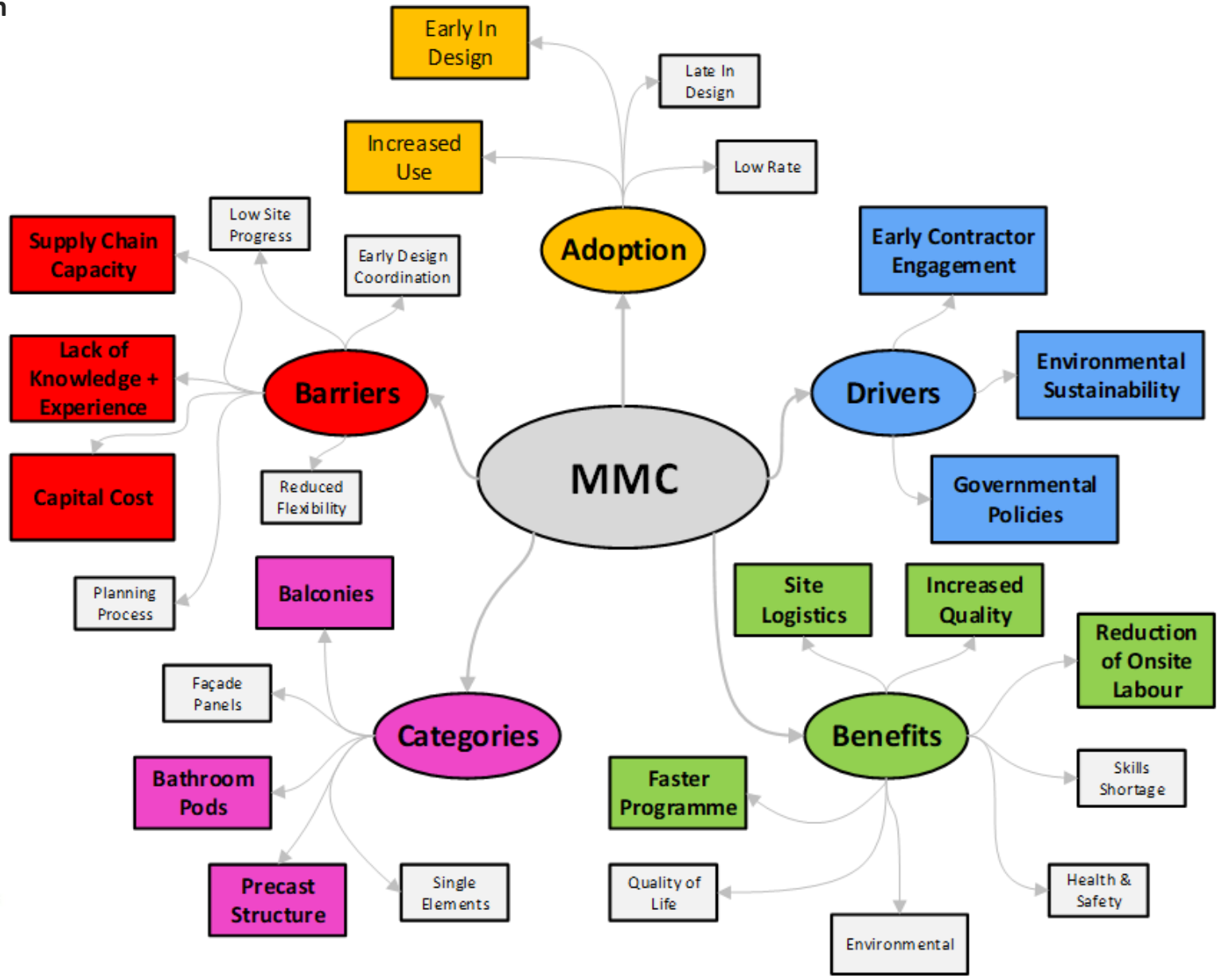
Modern Methods of Construction (MMC)

MSc Dissertation Research



Interview Response Thematic Analysis Chart.

Modern Methods of Construction (MMC)

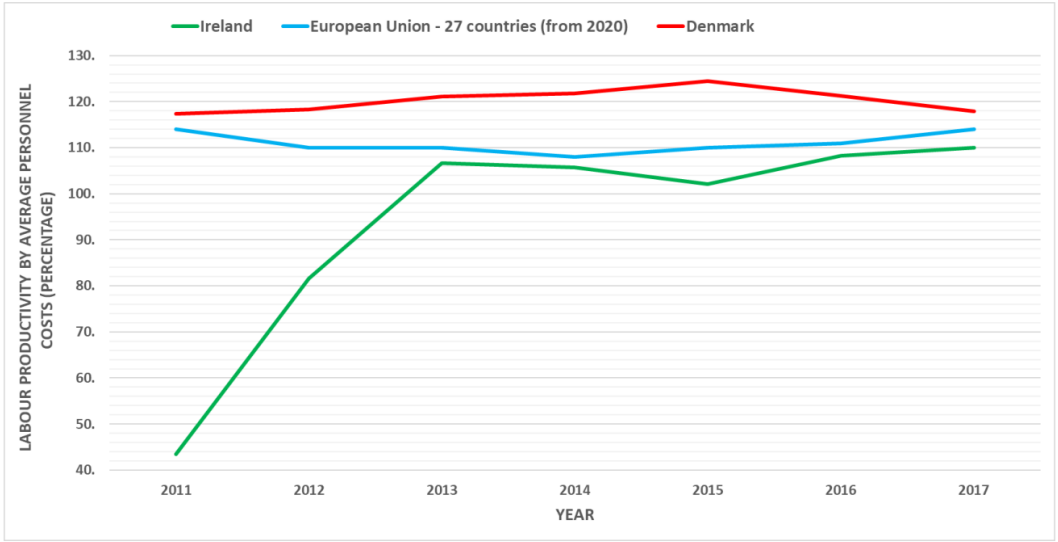
Drivers – Governmental Policies / Environmental Sustainability

General Posted Mar 29, 2021 Add new comment

passive house+

News desk

Denmark sets out phased embodied carbon targets for buildings



Danish and Irish Economic Productivity in the European Context

An Bille um Ghníomhú ar son na hAeráide agus um Fhorbairt Ísealcharbóin (Leasú), 2021

Climate Action and Low Carbon Development (Amendment) Bill 2021

Mar a tionscnaíodh

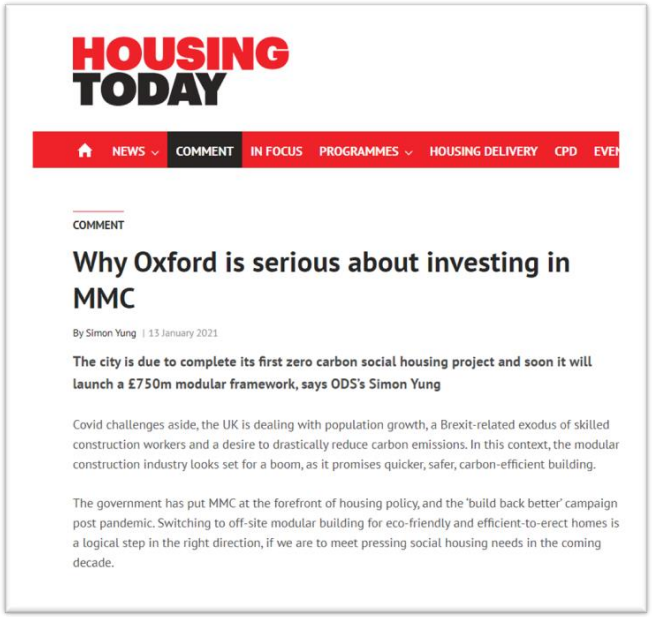
As initiated

(5) The first two carbon budgets proposed by the Advisory Council shall provide for a reduction of 51 per cent in the total amount of greenhouse gas emissions over the course of the first two budget periods ending on 31 December 2030, from the annual greenhouse gas emissions reported for the year ending on 31 December 2018, as set out in the national greenhouse gas emissions inventory prepared by the Agency.

Source: Irish Government – Climate Action and Low Carbon Development (Amendment) Bill 2021

Modern Methods of Construction (MMC)

Drivers – Governmental Policies / Environmental Sustainability



HOUSING TODAY

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COMMENT

Why Oxford is serious about investing in MMC

By Simon Yung | 13 January 2021

The city is due to complete its first zero carbon social housing project and soon it will launch a £750m modular framework, says ODS's Simon Yung

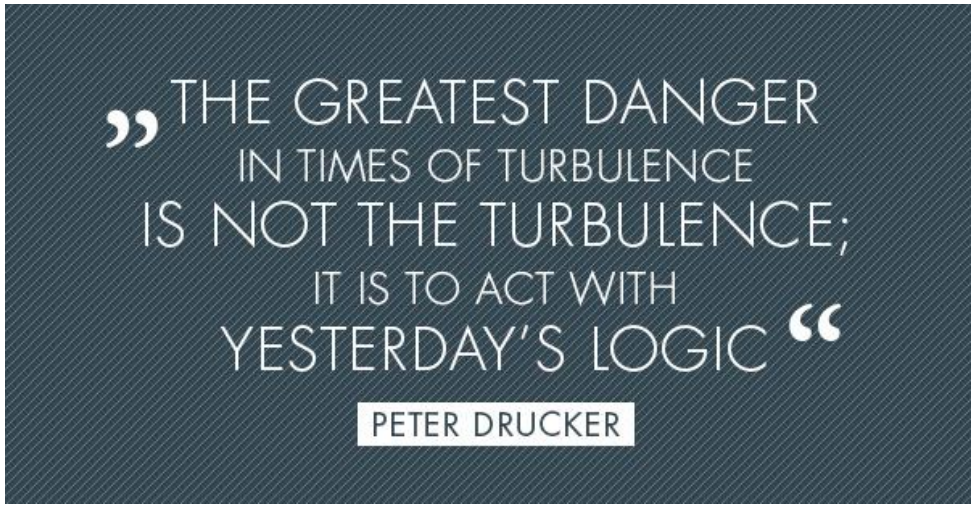
Covid challenges aside, the UK is dealing with population growth, a Brexit-related exodus of skilled construction workers and a desire to drastically reduce carbon emissions. In this context, the modular construction industry looks set for a boom, as it promises quicker, safer, carbon-efficient building.

The government has put MMC at the forefront of housing policy, and the 'build back better' campaign post pandemic. Switching to off-site modular building for eco-friendly and efficient-to-erect homes is a logical step in the right direction, if we are to meet pressing social housing needs in the coming decade.

What does all this Mean ?

If we want to create a Construction Industry

- Decarbonises Construction
- Improved Productivity (Value, Time, Outputs)
- Increases the Housing Output
- Improved Health and Safety / Wellbeing
- Higher Quality



We Need:

- **Place Sustainability at the core of how we Procure, Design and Deliver Buildings.**
- **Challenge the Normal Value Chain**
  - New Procurement Methodologies
  - Increased Collaboration + Less Adversarialism
  - Pre-Manufacture more Value
- **Cohesive Governmental Policies** (Environmental, Construction, Procurement)
- **Transition to Digital Workflows**
- **Training / Upskilling**
- **Incentivise Supply Chain Capacity** (Grant Aids etc)

THANK YOU

patkirwan2005@gmail.com