Barratt Redrow

Oregon Timber Frame Engineering Analysts' visit

1 May 2025

Agenda for the visit

- 10.10 - Safety Introduction to Oregon Timber Frame Engineering's Derby Facility
- 10.15 - Presentation from Oliver Novakovic, Group Technical & Innovation Director with follow-on Q&A
- 11.15 - Comfort break
- 11.20 - Presentation from Peter Wade, Joint Managing Director, Oregon Timber Frame Engineering (OTFE) with follow-on Q&A
- 12.00 - Site tours - 2 groups, one with Jason Powell, Operations Director, OTFE Derby and the second with Peter Wade
- 12.55 - Lunch and opportunity to view the timber frame display area and the facility in operation from the display area
- 13.30 - Final Q&A session
- 13.45 - Depart by coach back to Derby station for the 14.32 train

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Innovation at Barratt Redrow and our MMC journey

Oliver Novakovic, Group Technical & Innovation Director

Overview of our modern methods of construction (MMC) journey

2007

First national housebuilder to deliver a Code 6 Zero Carbon House using MMC.

2014

Review of **Offsite Manufactured** Solutions established.

MMC strategy developed - 20% of homes built with MMC targeted for 2020.

Group agreement with Stewart Milne Timber Systems to deliver timber frame in UK.

Consumer workshops to assess consumer awareness and associations with offsite manufacturing.

2016

Large format block (precast concrete blocks) first trialled with Roofspace at Bottesford.

2015

Hanham Hall completed. The UK's first housing development to achieve 2016 Zero Carbon Standard.

Over 80 suppliers brought together to consider innovative MMC applications.

2018

MMC innovation day with current suppliers (200 attendees).

Barratt Developments' Executive Team, NHBC and Industry Partners visit Germany and the Netherlands as part of a **European Study Tour 2018**.

2019

20% of homes built with MMC achieved **one year early**. **Oregon Timber Frame** acquired.

First national housebuilder to publish **science-based carbon reduction targets**.

2020

2022

AIMCH Project concludes providing key learnings in standardisation, automation and data on advanced MMC with partners L&Q and Stewart Milne.

2021

The Zed House is complete, achieving **125% reduction** in carbon emissions and applied **lightweight cladding**.

Air Source Heat Pump trial started at Delamare Park.

2023

eHome2, a zero carbon home, created to test the impact of climate change and how homes can deal with extreme weather.

Research on consumer perceptions of MMC incl. awareness, purchase likelihood, perceived benefits & drawbacks.

2025

Barratt Redrow **exceeded 30%** of homes built utilising MMC by 2024.

Barratt developing new housetypes designs. Considering lightweight cladding, bathroom pods and roofing solutions.

Where we are: May 2025

There have already been incredible changes in housebuilding:

- Biggest change in regulations the industry has seen in 40 years
- Increased use and requirements for EPDs and sustainable materials
- Demand to build more homes and build them quicker
- Increased use of Modern Methods of Construction

We are still facing big challenges:

- Housing shortages, high demand and slow supply
- Regulatory pressures, clarity and application of regulations
- Climate concerns - Energy Efficiency and Net Zero targets
- Ageing demographics - Lack of skilled trades

Key considerations and road map for the business

Short Term (Present - 3 years)	**Medium Term** (3-6 years)	**Long Term** (6+ years)
Future Homes Standard	**Net Zero Carbon Homes***	**Net Zero Carbon Operations****
2025	2030	2040
Drivers		
• Future Homes Standard (FHS) - requires 75-80% carbon reduction	• Barratt to be net zero by 2030 – regulated energy • Ageing workforce and labour shortages continue to impact the industry	• Barratt to be net-zero across all operations by 2040 • Regulatory targets on embodied carbon will influence material choices
Key Recommendations		
• Take key learnings from Zed House and eHome2 to meet FHS • Develop and rollout 2025 housetype ranges to support MMC integration and standardisation	• Explore innovative systems and technologies to meet carbon targets • Accelerate the use of labour-reducing build methods	• Increase Oregon's capacity and extend capability • Integration of other low carbon MMC systems e.g. lightweight cladding

* All new housetypes to be zero carbon from 2030 (regulated energy)
** Reduce operational carbon emissions to net zero by 2040

Modern methods of construction (MMC) is becoming increasingly important

- MMC stems from the need for more efficient, sustainable and cost-effective building techniques
- Drivers for MMC adoption include; enhanced speed, sustainability, waste reduction, skills shortages and Health and Safety improvements
- Advancements in technology and materials have facilitated the development and implementation of MMC

The government defined a seven-category framework for MMC to help encourage greater use and adoption

3D primary structural systems	2D primary structural systems	Pre-manufacturing components	Manufacturing: Structural and non-structural	Non-structural assemblies and pre-assemblies	Product led site labour reduction/ improvements	Process led site labour reduction/ improvements
						
e.g. Bathroom/ kitchen pods	e.g. Open panel timber frame	e.g. Insulated offsite ground floors	e.g. 3D construction	e.g. Floor/roof cassettes	e.g. Lightweight cladding	e.g. Robotics

Key drivers are increasing the need for further MMC adoption

Sustainability

Past: L | Present: H

- Barratt 2030 and 2040 net zero targets
- Push for sustainable materials and waste reduction

Skill Shortages

Past: M | Present: H

- Increasing labour constraints and an ageing workforce
- Requirements are evolving – more emphasis on digital skills

Quality Control

Past: H | Present: H

- MMC adoption and standardisation contributes towards enhanced quality
- Customer expectations have risen over the years

Cost Certainty

Past: H | Present: H

- Cost certainty is a key driver behind the adoption of MMC
- MMC can incur high costs particularly at early stages

Build Acceleration

Past: M | Present: H

- MMC uses more offsite production to increase efficiency and productivity
- Increased build speeds leading to improved ROCE

Regulation

Past: M | Present: H

- Greater energy efficiency and lower embodied carbon targets
- Changes easier to implement in a manufacturing environment

Supply Availability

Past: M | Present: H

- Deliveries severely impacted by global events (Covid, Brexit etc.)
- Delays on site reduced with fewer components needed

Customer

Past: M | Present: H

- Customers are cautious but open to the use of MMC
- Lack of MMC awareness leads to some scepticism

L Low importance
M Medium importance
H High importance

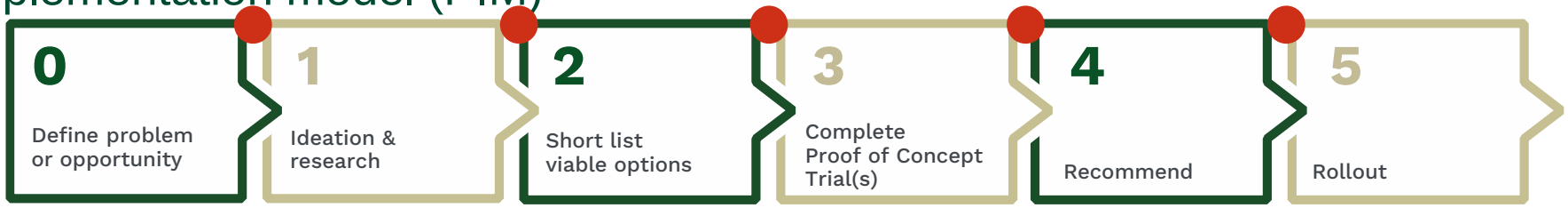
Risk management and governance

Barratt Redrow product implementation model (PIM)

PIM STAGES

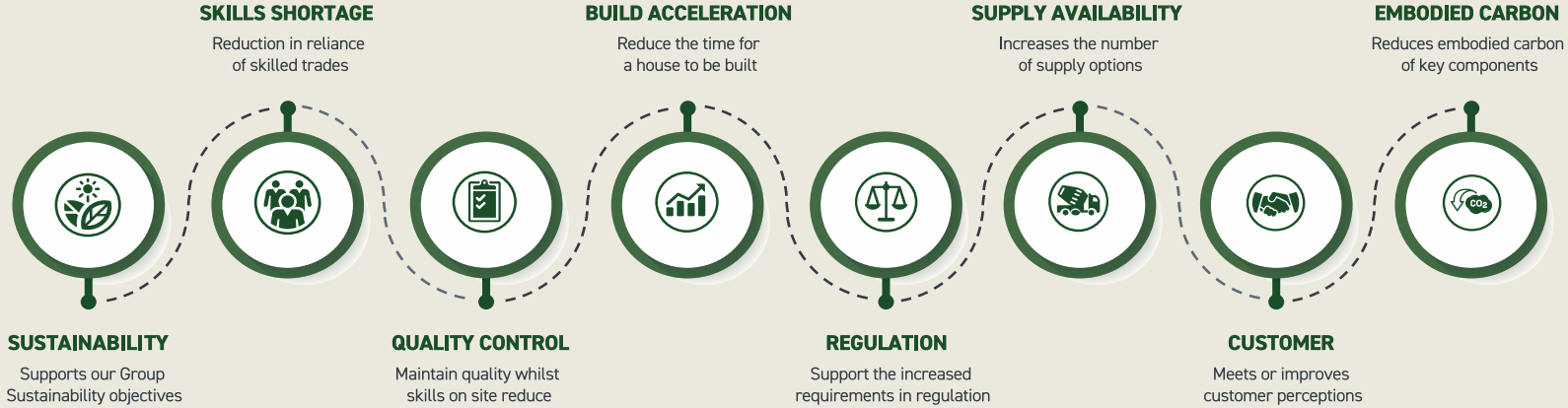
PIM has six key stages to ensure a robust review and rollout of innovative, that builds on our New Product Introduction approach.

Governance control points



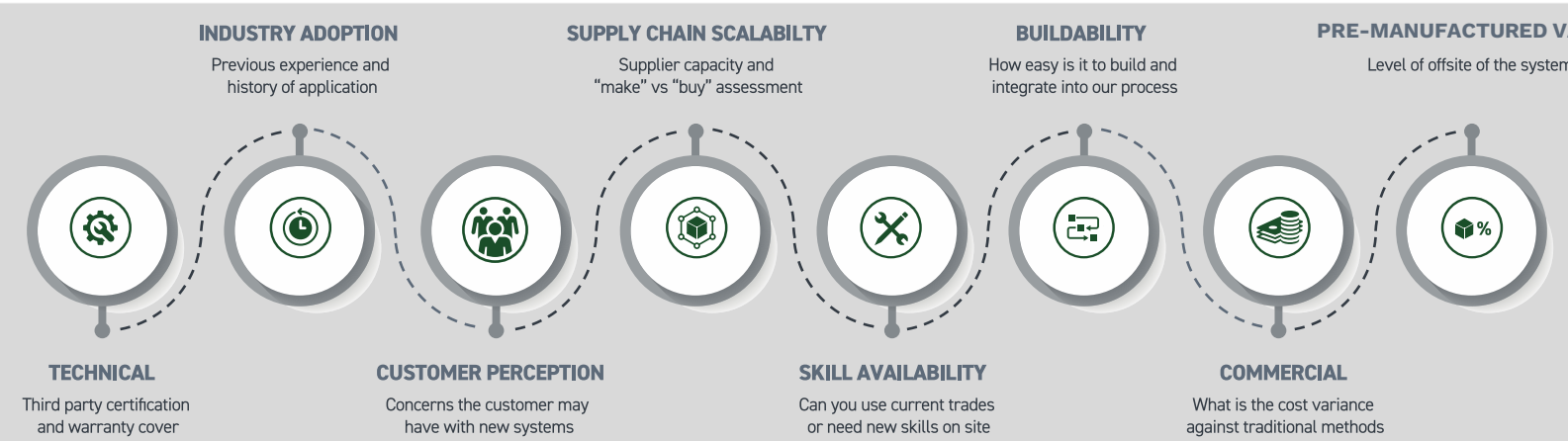
BENEFITS

Innovative is assessed against a set of benefits to ascertain the impact they will have against our key drivers.



RISK EXPOSURE

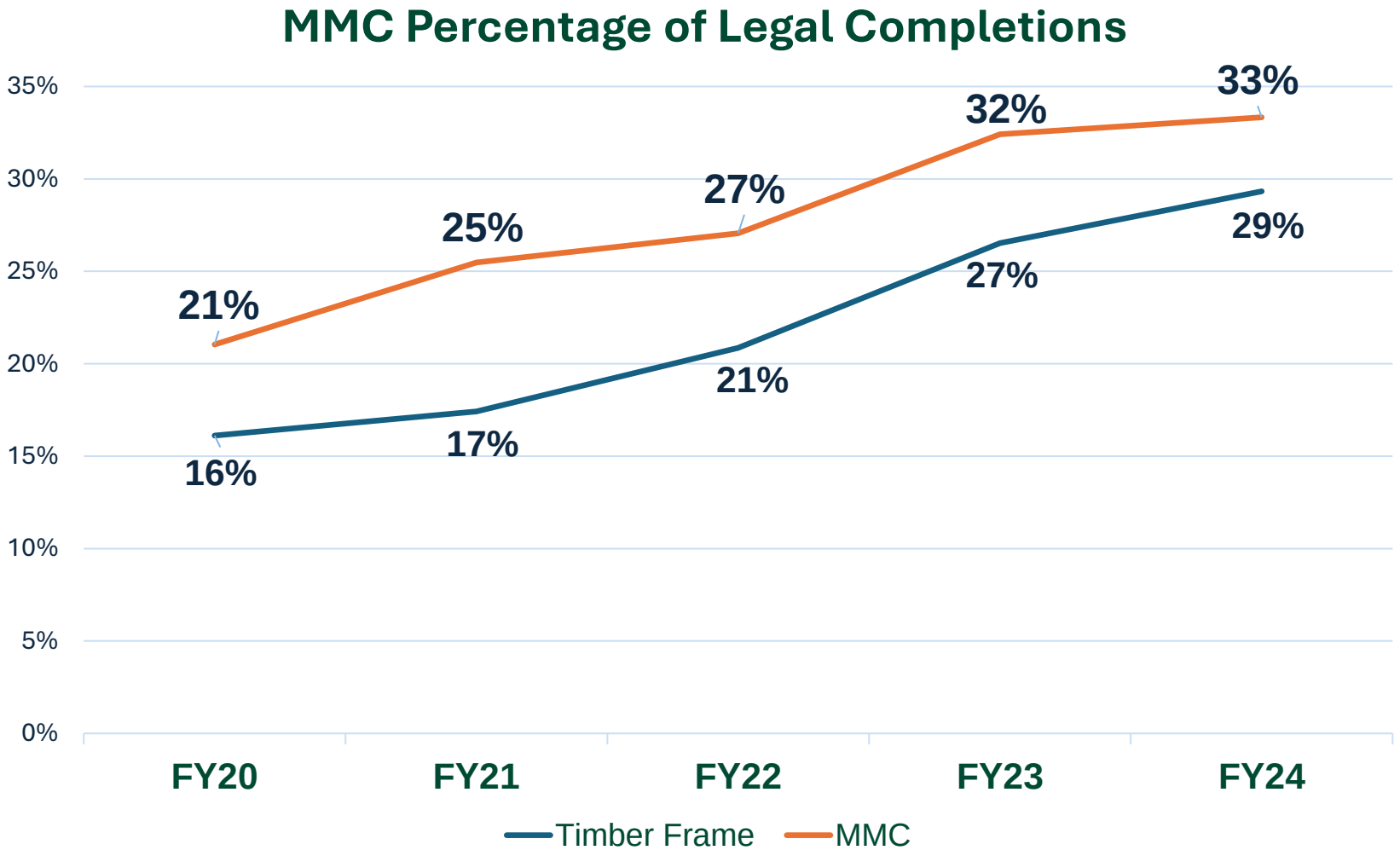
Innovative is assessed against a set of risks to ascertain the barriers to rollout.



MMC growth

FY20 to FY24

- MMC and timber frame has consistently grown over the past five years
- Successful integration of Oregon fuelling the timber frame growth
- Surpassing our FY25 MMC Target two years early
- Further growth over the next five years through Oregon's expansion and potential capacity



MMC development

Standardisation and optimisation

Background

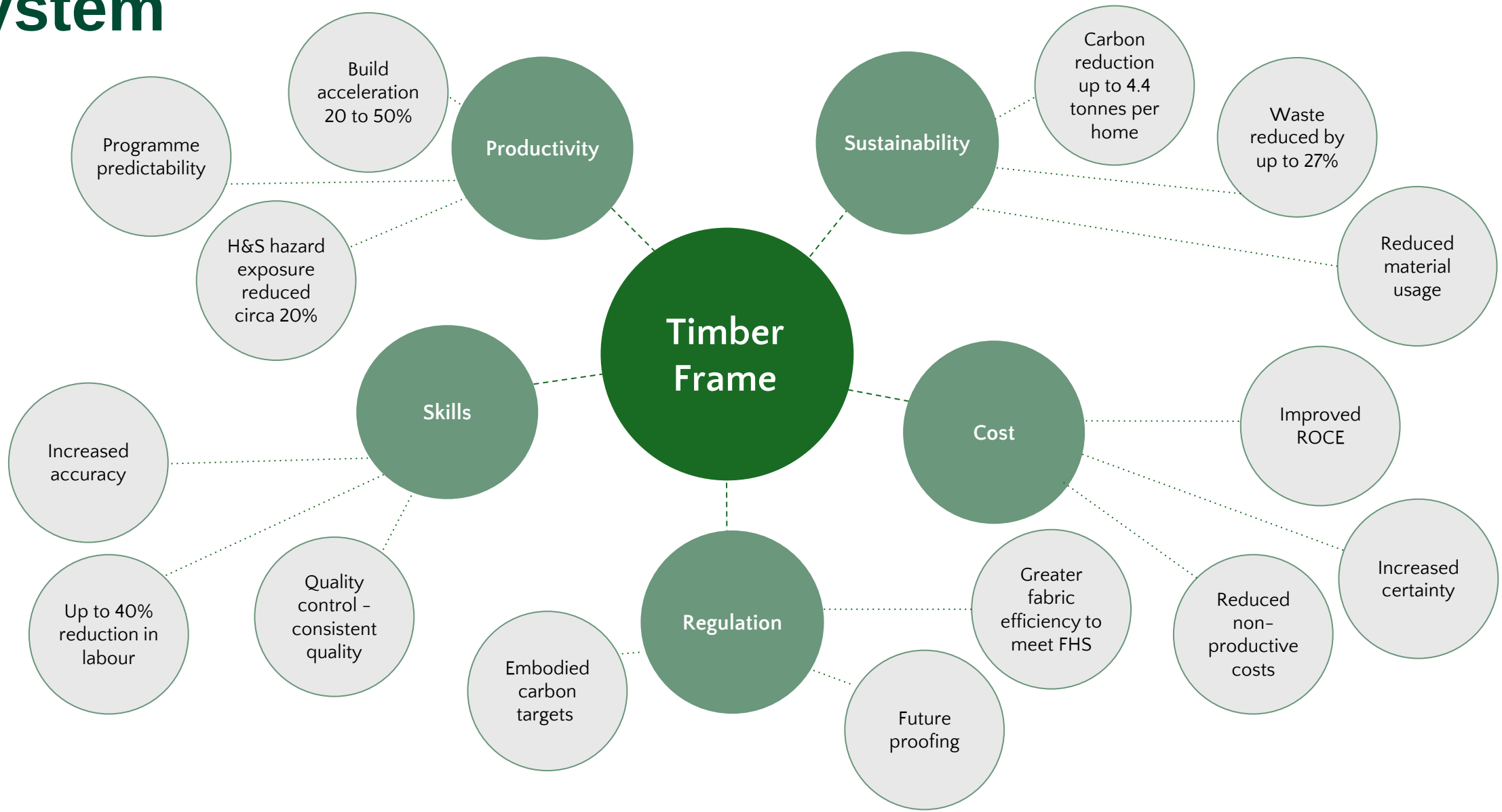
The Group has been developing its approach to MMC for over 10 years. As timber frame volume grew, Group Design and Technical (GDT) simplified the Barratt range to be better suited to timber frame construction.

GDT has further standardised the Barratt housetype designs to better suit timber frame and MMC.

New housetype designs, across all brands, are being designed with greater levels of standardisation with Design for Manufacture and Assembly (DfMA) principles being adopted.

This will help further maximise the benefits of MMC and specifically timber frame.

Benefits of timber frame as the primary MMC system



Closed panel timber frame

Overview:

- New Derby production facility has capacity for c.1,000 closed panel timber frame kits per year
- Further enhances the benefits of timber frame
- Reducing the reliance of on-site skilled trades
- Moving tasks into a controlled production facility environment

Closed Panel Projects:

- Utilised on AIMCH, Zed House and Energy House 2.0 projects
- Trial the Derby closed panel system for the first time on live development in partnership with Homes England

NHBC Accepts

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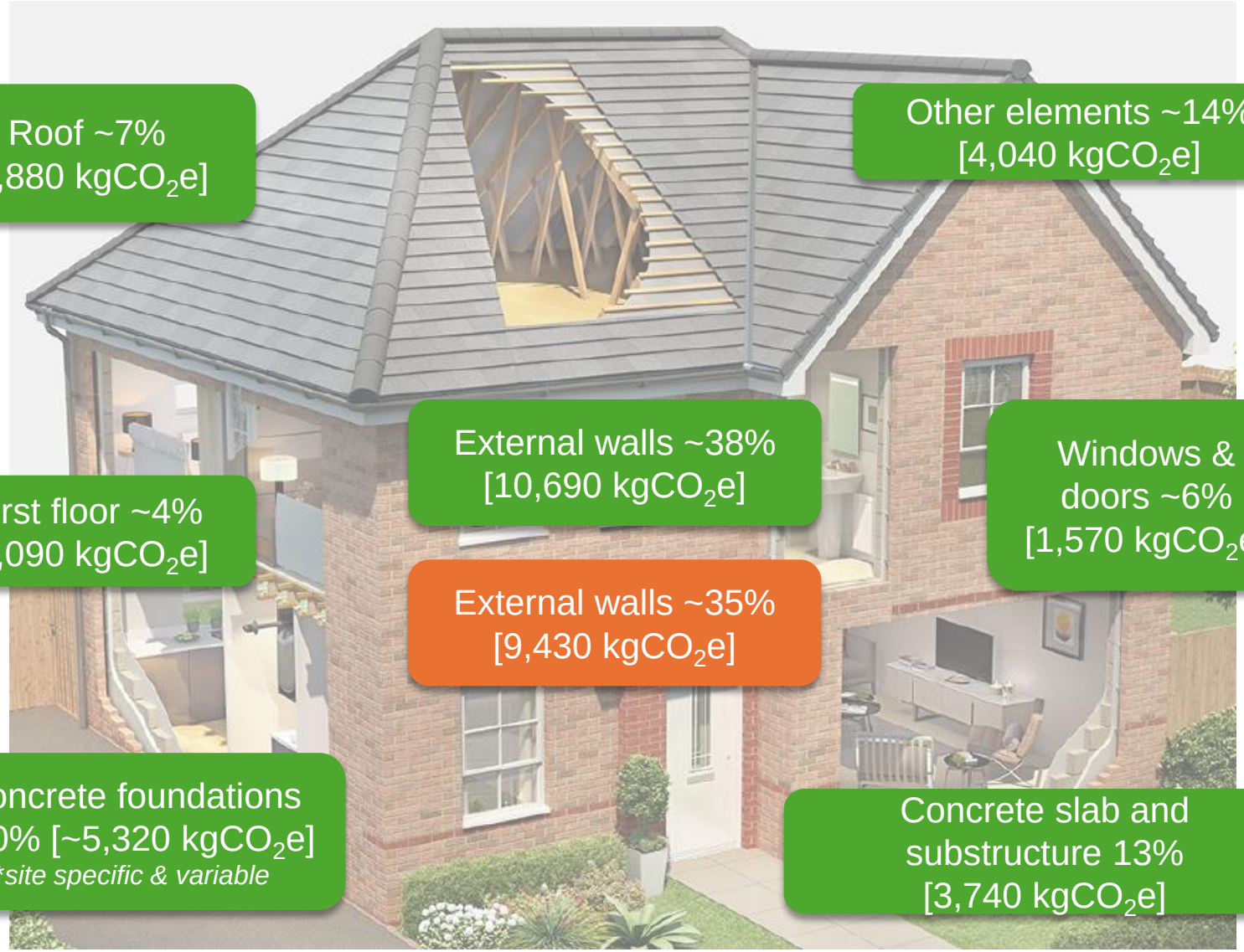
Masonry vs timber frame carbon footprint



Roof ~7% [1,880 $kgCO_2e$]

Other elements ~14% [4,040 $kgCO_2e$]

External walls ~38% [10,690 $kgCO_2e$]

First floor ~4% [1,090 $kgCO_2e$]

Windows & doors ~6% [1,570 $kgCO_2e$]

External walls ~35% [9,430 $kgCO_2e$]

Concrete foundations ~20% [~5,320 $kgCO_2e$]
**site specific & variable*

Concrete slab and substructure 13% [3,740 $kgCO_2e$]

Traditional masonry

Timber frame

Timber frame homes contain ~5% less upfront carbon [A1-A5] overall than traditional equivalent, due to replacing the inner leaf of block and mortar with the timber frame.

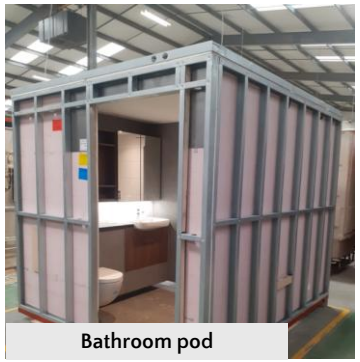
We are well positioned with proven ability to deliver, but further opportunities exist

Forefront of the market

Energy house

- **Regulatory goals** – eHome2 and Zed house providing valuable insight and knowledge around surpassing government targets
- **Test data** – Results of eHome2 tests helping to inform longer term decisions
- **Vertical integration** – Oregon investment allows control of timber frame supply chain

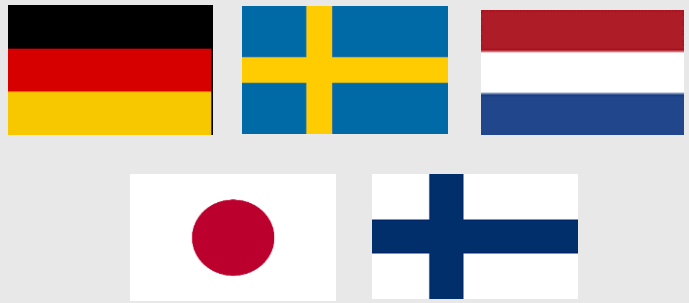
Opportunities for MMC innovation


Bathroom pod


Closed panel timber frame

- **Bathroom pods** – fully finished bathrooms or ensuites delivered to site fully finished
- **Closed panel timber frame** – utilise Derby production line on Homes England sites
- **Cladding system** – Look at alternative cladding systems to further reduce reliance on traditional trades and lower our embodied carbon

International research



- **Germany & Holland** – Further ahead with advanced construction methods such as closed panel timber frame and large format block
- **Japan** – Prefabrication seen as a premium product with sustainability and dealing with earthquakes seen as crucial
- **Sweden & Finland** – Offsite manufacturing accounts for the majority of housing, with a drive for energy efficiency

Lightweight Cladding – Current Opportunities

Group Design and Technical have assessed over 20 cladding systems as part of a recent full market review. The below summarises the key lightweight cladding options from this assessment as well as the key benefits.

Drivers	Key Benefits
Sustainability & Regulation	30-75% lower embodied carbon
Skill Shortages	Reduces skills requirement 10-15%
Quality Control	Achieves same quality as brick/render
Cost Certainty	On average cost neutral to traditional methods
Build Acceleration	Improved build speed by 5-50%
Customer	Design flexibility
Supply Availability	Increased supply availability

TopHat/Mauer	Brickslip	Weberwall	Ecobrick	Hardieplank
				
OVERVIEW • Trialling on a live site show home with North Midlands • Two Sample panels delivered at Oregon's Derby facility to show wall build up	**OVERVIEW** • Supplied by Ibstock and Weinerberger • Currently not commercially viable for low-rise housing • Reviewing for use on high-rise projects	**OVERVIEW** • Trialled on flagship eHome2 project • Cost uplift compared to standard brick	**OVERVIEW** • Delivered two substations using the Ecobrick successfully • Further trials under review	**OVERVIEW** • Trialled as part of Zed House project • Currently looking to trial in conjunction with TopHat system • Used widely throughout the business on blockwork

Trials of Mauer Cladding Product

Sample Panel Trials

- We have constructed 2 trial structures using the Mauer cladding product at Oregon's Derby facility.

Live Site Trial

- Delivered a whole house (show home) at Cotgrave, North Midlands

Looking forward

1. Drive greater standardisation and simplification through future housetype ranges enabling other MMC innovations to be integrated into timber frame.
2. Understand the full impact of the Future Homes Standard and measure carbon impact for updated timber frame forecast volume.
3. Increase Oregon open timber frame volume through expansion plans.
4. Increase Oregon closed panel timber frame usage through strategic sites e.g. Homes England.
5. Provide a strategic road map for more advanced solutions (e.g. lightweight cladding solutions).
6. Expand our timber frame volume across both Barratt and David Wilson brands.

Thank You

Questions?

Barratt Redrow

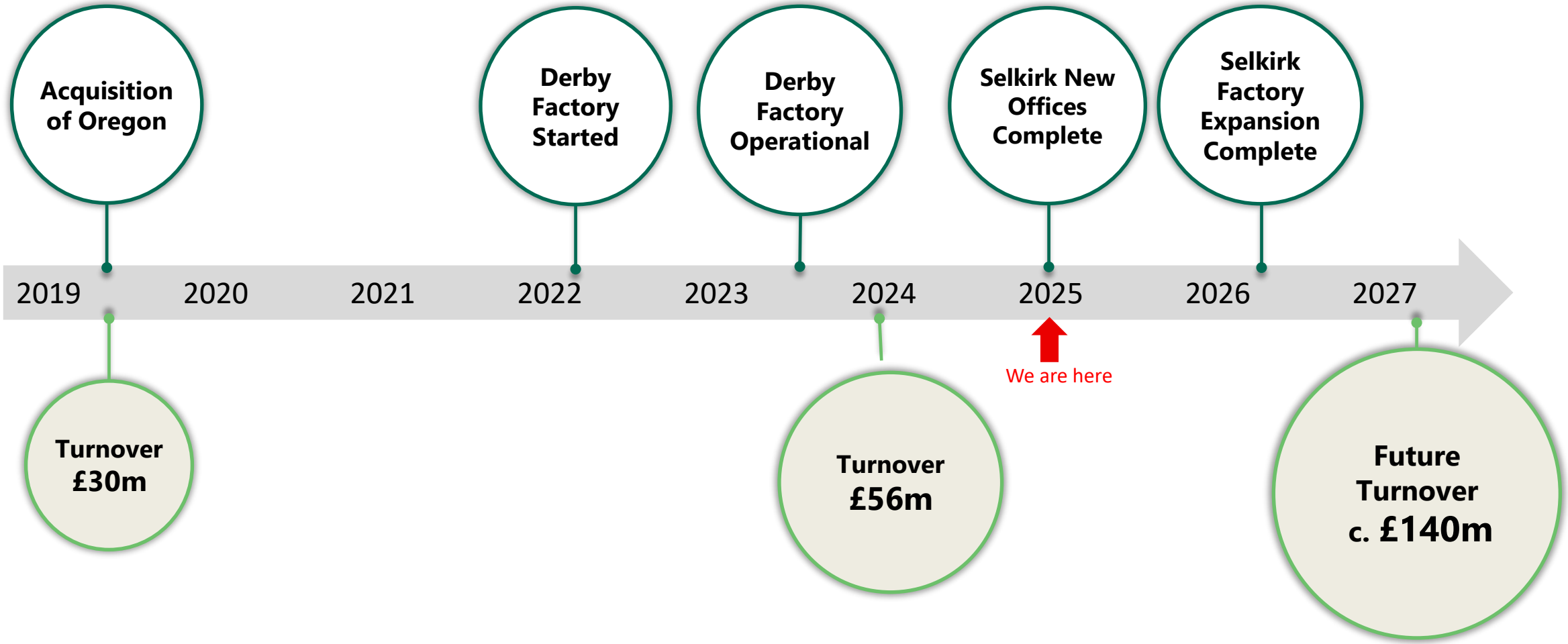
Oregon Timber Frame Engineering

Peter Wade, Joint Managing Director, Oregon Timber Frame Engineering.

Agenda

- Oregon Timeline
- Potential Capacity
- Derby Growth
- Selkirk Expansion
- Q & A

Timeline summary



Oregon potential capacity

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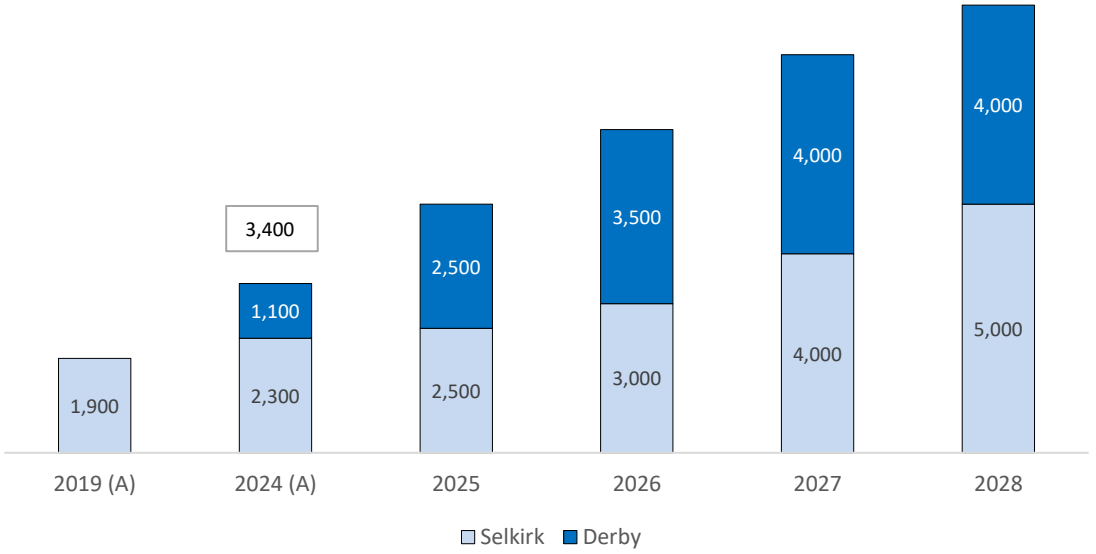
Selkirk

- Production facility expansion project will increase capacity to c. 5,000 kits

Derby

- Opened July 2023
- Capacity growing as plan, to capacity of c. 4,000 kits per year.

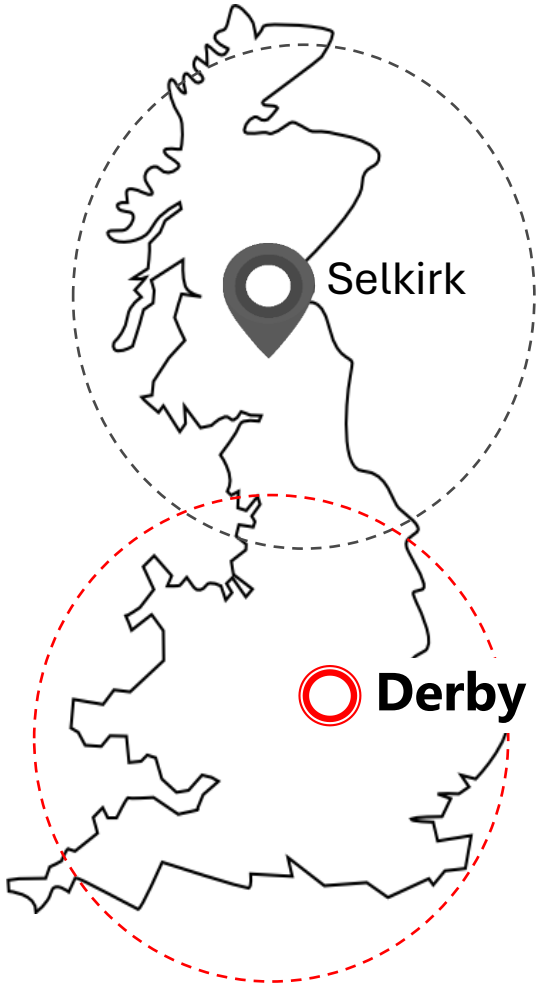
Total Future Capacity = c. 9,000 kits



Potential Future Capacity assumes efficiency gains from adoption of MMC principles, such as:

- Increased adoption of standardisation of product, materials and detailing
- Adoption of Design for Manufacture (DFM) through whole design process
- Accurate planning and consistency of workload

Derby overview

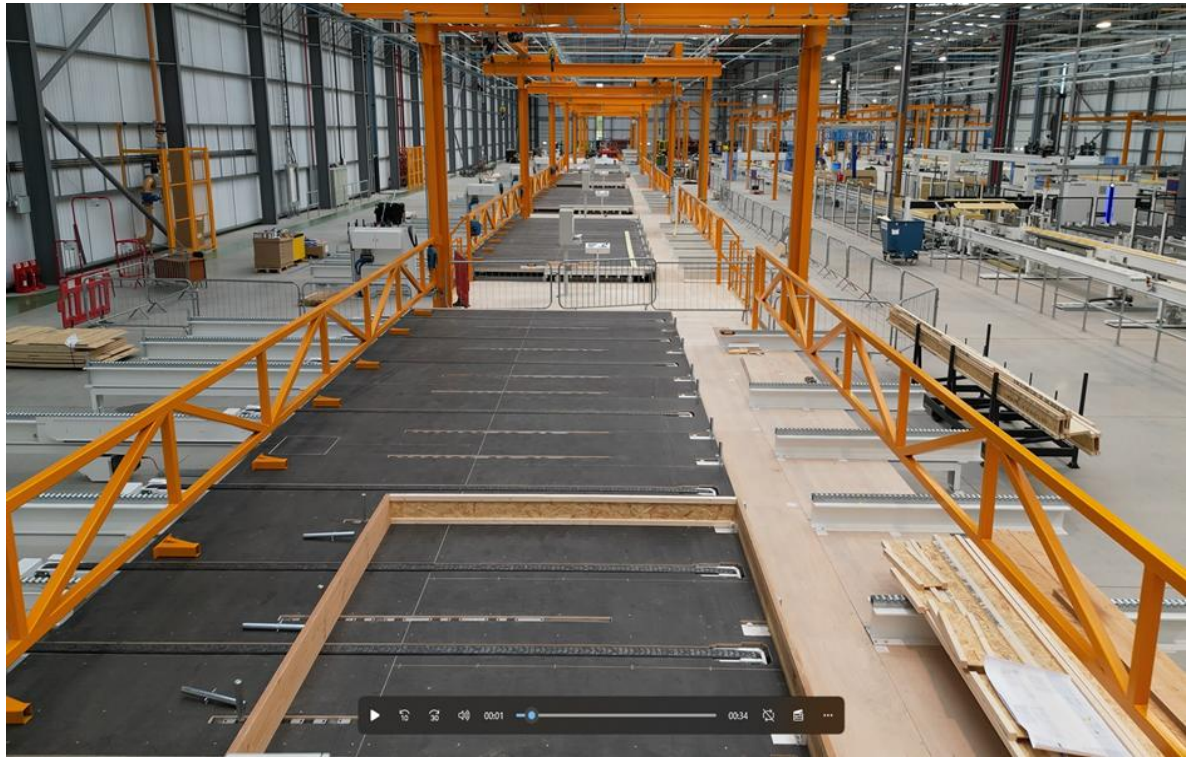


- Purpose built, by Wilson Bowden Developments, 186,806 square feet production facility.
- Annual production capability: 4,000 timber frame kits.
- c.200 people when fully operational.
- £40m investment (£26m land and buildings, £14m plant and machinery) – delivered on time and within budget.

Production lines

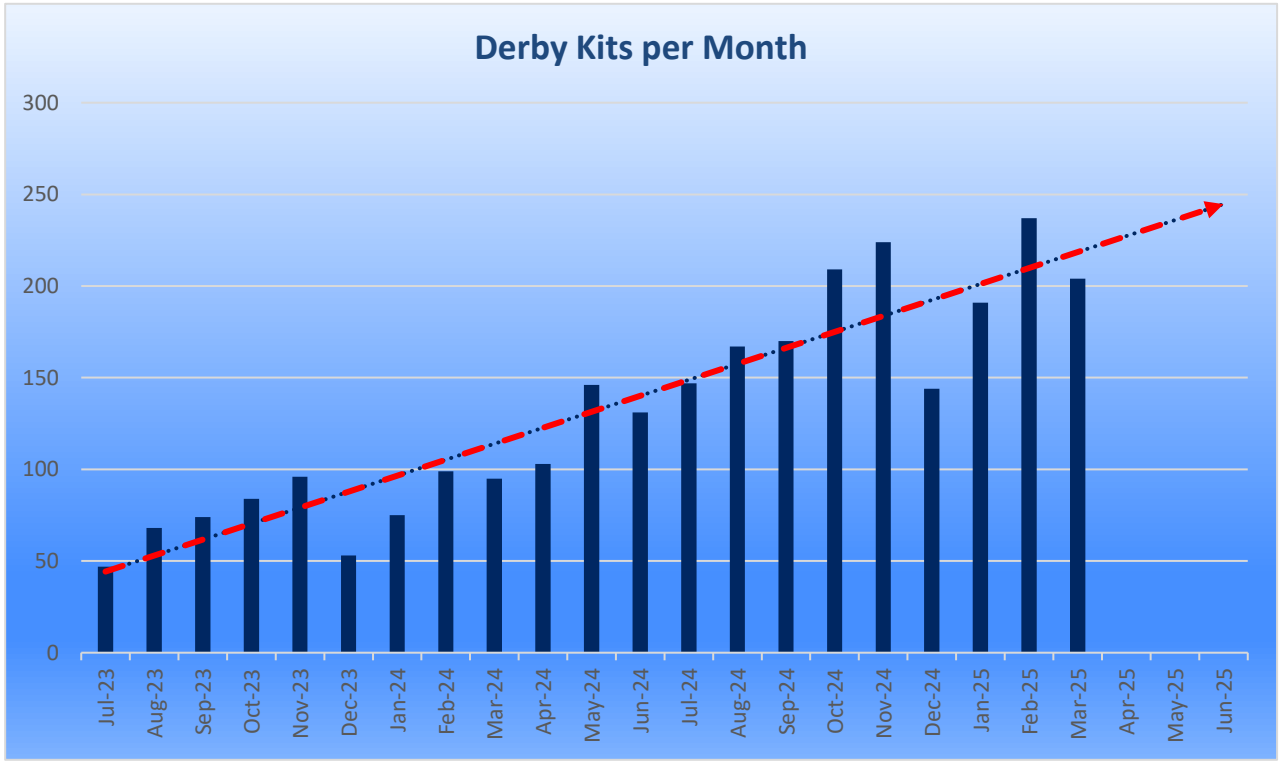
Weinmann manufacturing equipment:

- Open Panel Line – 10m multiwall
- Closed Panel Line – 10m multiwall
- 8x Cassette Tables – up to 12m x 3.5m



Derby – output

- Production began in July 2023.
- Strong volume growth
- 1,071 kits delivered in FY24
- Over 1,000 kits delivered H1 FY25
- On target for 2,400 kits in FY25
- Full planned operative headcount by FY26 (working twin shifts)
- Max. capacity c. 4,000 kits per year



Selkirk – Site Expansion Plans

North Factory

Existing	42,000 sq. ft	
Extension	27,000 sq. ft	
Total	69,000 sq. ft	(64% increase)

South Panel Factory

Existing	39,000 sq. ft	

South Floor Factory

Existing	17,000 sq. ft	
Extension	8,000 sq. ft	
Total	25,000 sq. ft	(47% increase)

Selkirk – new offices

Selkirk – expansion programme on track

Office	Building Start	May 24	
	Building Finish	Dec 24	
	Ready	Feb 25	(IT Set Up, Furniture & Office Move)
North Factory	Building Start	Nov 24	
	Building Finish	Jun 25	
	Ready	Oct 25	(Oregon Fit Out, Equipment, Car Park, Access Road)
	Equipment Acceptance	Mar 26	(6 months after start of production)
South Factory	Building Start	Apr 25	
	Building Finish	Oct 25	
	Ready	Dec 25	(Oregon Fit Out, Dust Extraction tbc)

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Thank You

Questions?