

Build Offsite Overcoming The Cost Challenge

Meinhardt UK
October 2018





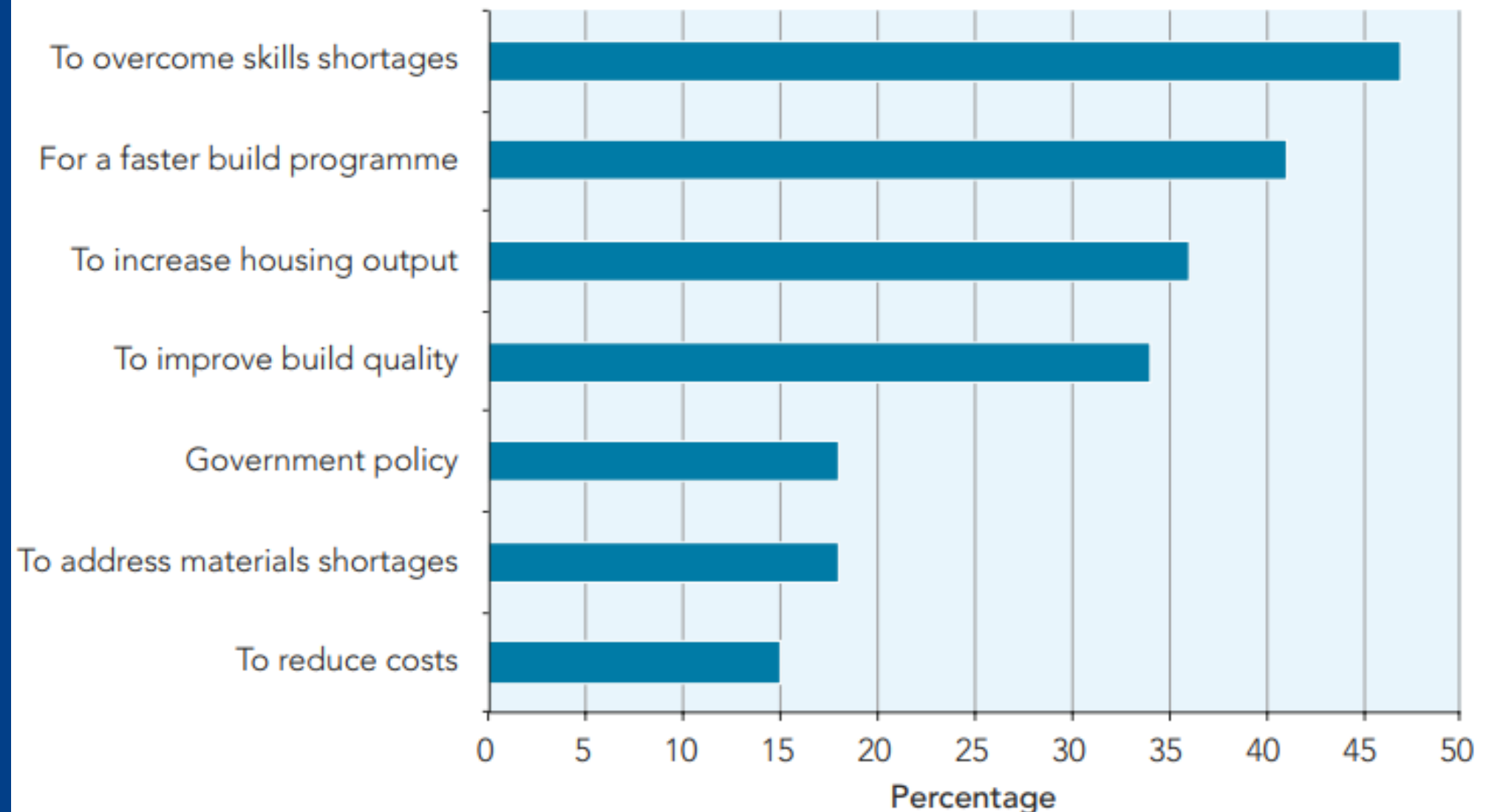
1.0 Why offsite?

Adoption of MMC: Reasons

Future

- Concerns over skills shortages, which are expected to continue over the next 3 years, were given as the main reason encouraging the use of MMC
- Other reasons are a wish to increase build speed and housing output and to improve quality

Main Reasons Why MMC is Expected to Play a Greater Role



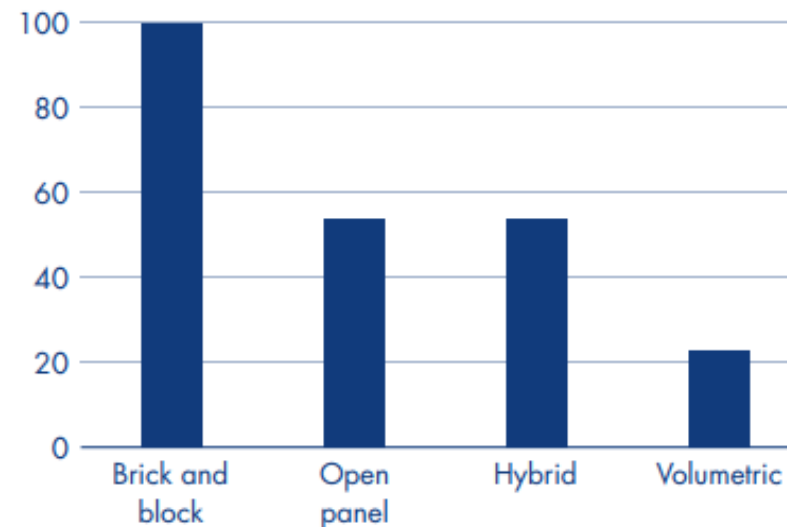
Base: 61 organisations expecting MMC to play a greater role.

Adoption of MMC: Construction Benefits

- Quality is protected because weather cannot damage what has already been built
- Bad weather cannot disrupt following trades
- Working conditions are improved because the workforce is protected from rain and excessive cold or sun

Less Weather Condition Effects

Typical time until weather tight as a proportion of brick and block requirements (per cent)



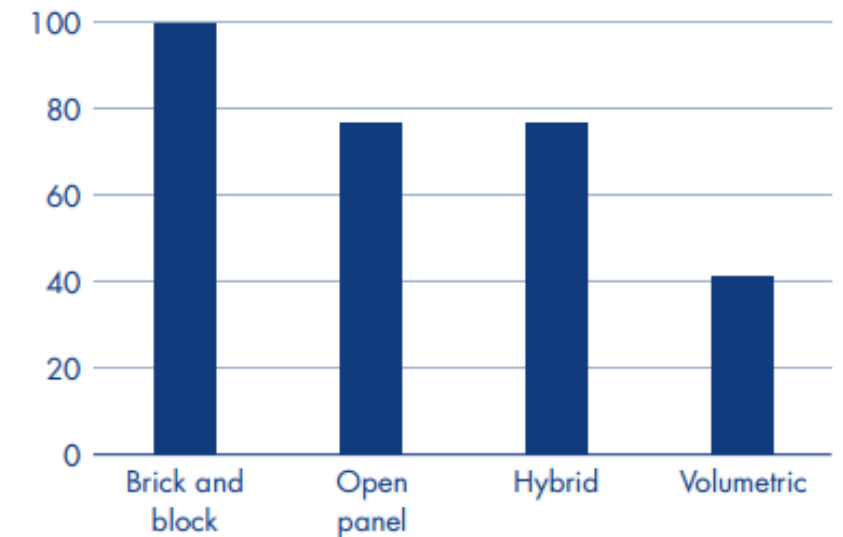
Source: Process plans prepared for the National Audit Office by the Salford Centre for Research and Innovation

“A Volumetric approach can reduced the on-site build time for the whole development to 16 weeks compared to 39 weeks for brick and block”

Quote by Alex Morier on the Greenwich Creekside Development

Less On-site Duration

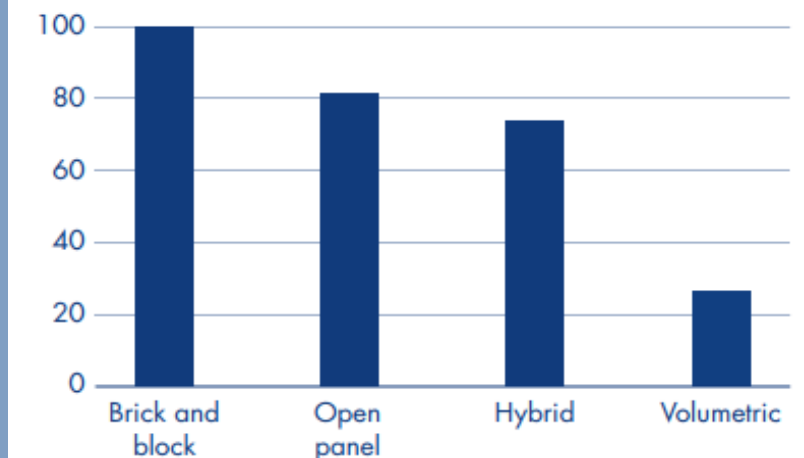
Typical construction period as a proportion of brick and block requirements (per cent)



Source: Process plans prepared for the National Audit Office by the Salford Centre for Research and Innovation

Less On-site Labour

Typical on-site labour days as a proportion of brick and block requirements (per cent)



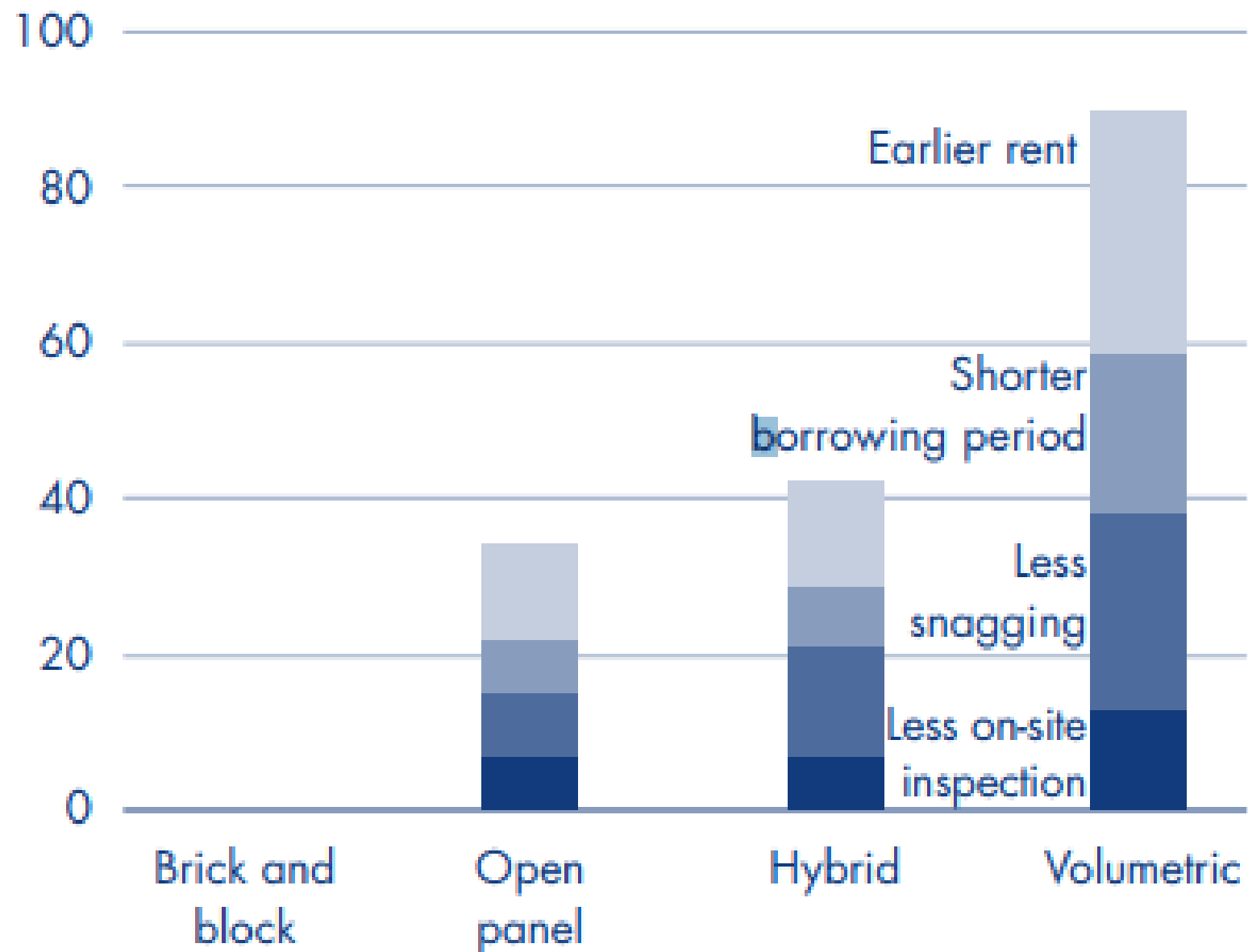
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Adoption of MMC: Financial Benefits

- Faster construction and reduced on-site work bring financial benefits that go about a third of the way to offsetting average increased construction costs for hybrid and volumetric construction methods
- Snagging costs are reduced because off-site construction elements are subject to the tighter quality control made possible in factory conditions
- The need for on-site inspection decreases as the amount of off-site work increases

Financial Benefits

Financial benefit (£/m²)



Source: Savings are expressed in relation to floor area to illustrate the extent to which they offset increased average construction costs expressed in the same terms

Strengths of Offsite Manufacture & Modular Design



20-40%

Reduction in Cost

- Cost certainty
- Higher productivity rate to a lower cost
- Reduced number of defects
- Benefits the PRS due to the speed of revenue
- Circular economy with systems designed to be disassembled



20-60%

Reduction in construction programme time

- Reduced overall manufacture and assembly time
- Reduced risk of delays
- Greater programme time certainty



70%

Reduction in onsite labour (Health & Safety)

- Conventional construction has a larger fatal rate and major injury rate than the manufacturing industry
- The number of in site hours can be reduced by 60%-80% which reduces the occurrences of injury



20%

Reduction in pollution and congestion (road accidents)

- Reducing the number of deliveries to the site, and the number of site staff, an offsite project can reduce pollution and road congestion up to 20%
- Noise is also minimised as more activities are done offsite



90%

Reduction in onsite waste using volumetric construction

- Reduction of waste produced onsite
- Less risk of pollution to local watercourses

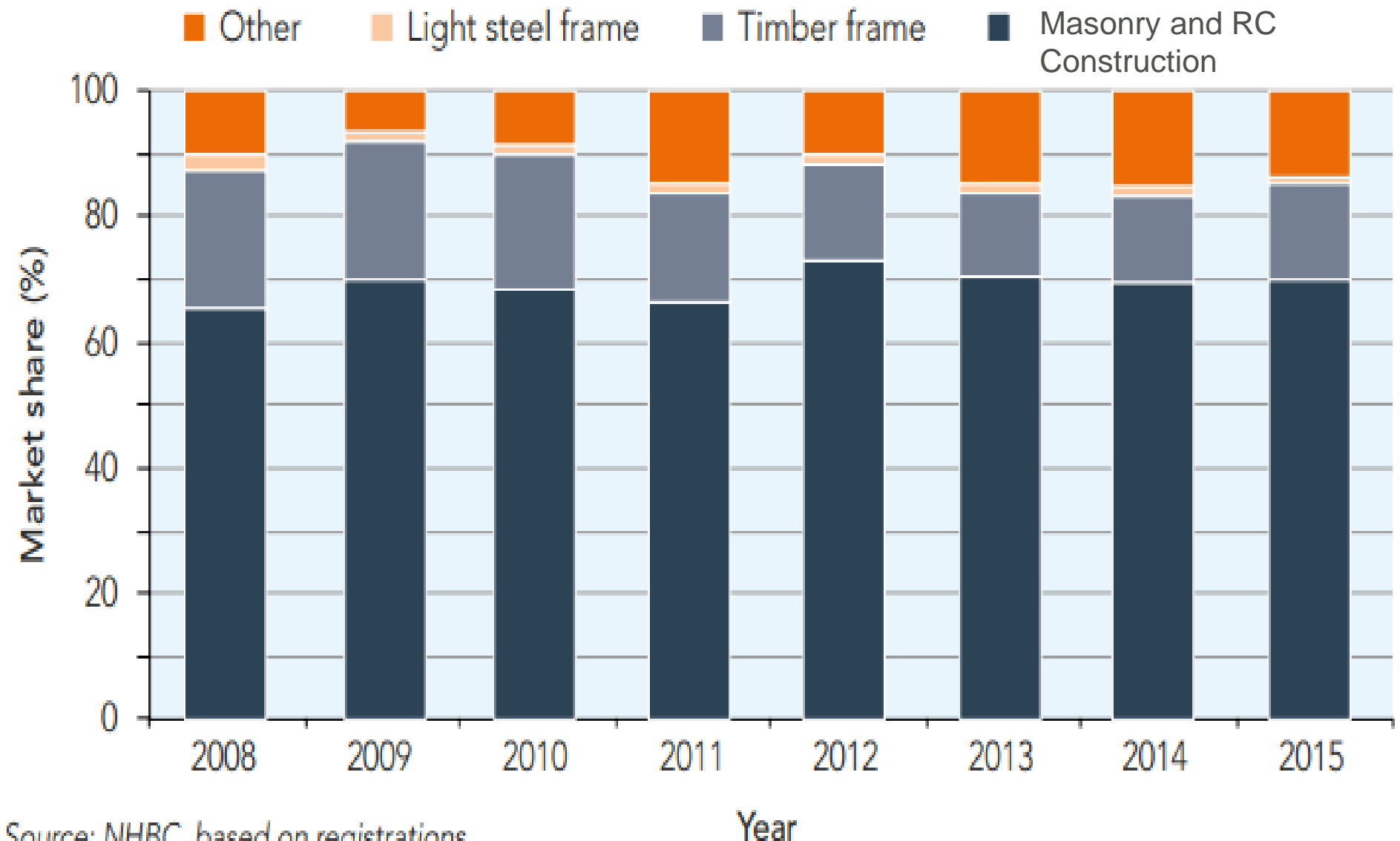
Source: RIBA Plan of Work 2013 Designing for Manufacture and Assembly (2016).

Adoption of MMC: Market Share

Present

- Masonry and RC construction continues to account for the majority of new residential build and the proportion has remained fairly constant over the last 8 years
- Several reports have been published which provide a range of market estimates, typically ranging from £1bn to £2.2bn
- Equates to 20,000 homes per year
- We need 100,000 extra homes per year:
- Market share could be £10bn...

New build, share by construction type in the UK

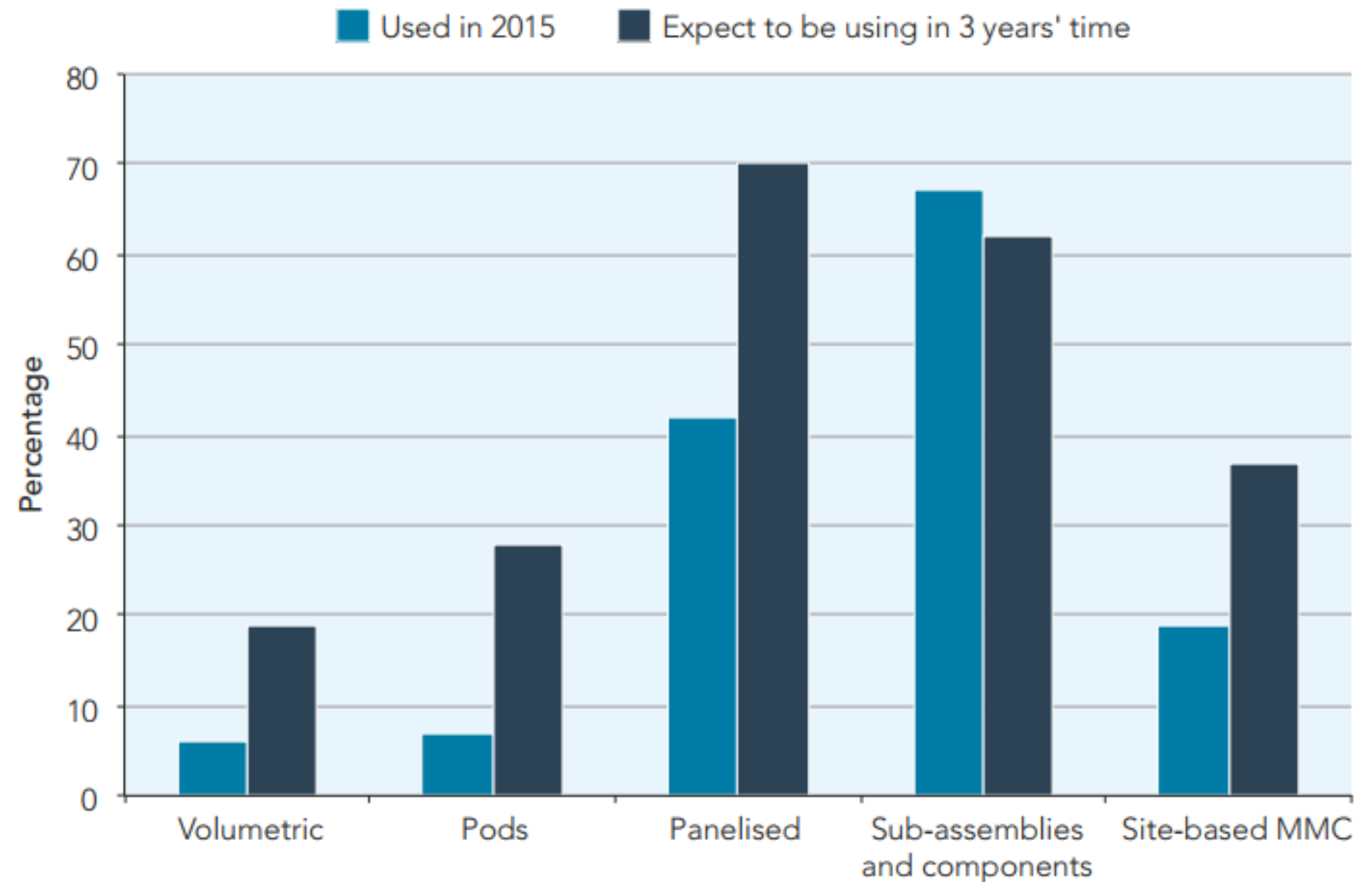


Adoption of MMC: Anticipated Role

Future

- 10% of housing need could be MMC
- Up to £2b per year
- It is expected that the use of MMC is likely to grow over the next 3 years; 45% anticipate that it will play a greater role in their organisation's construction processes. Only 3% of those surveyed expect the role of MMC to decline

Anticipated Role of MMC Over the Next 3 Years



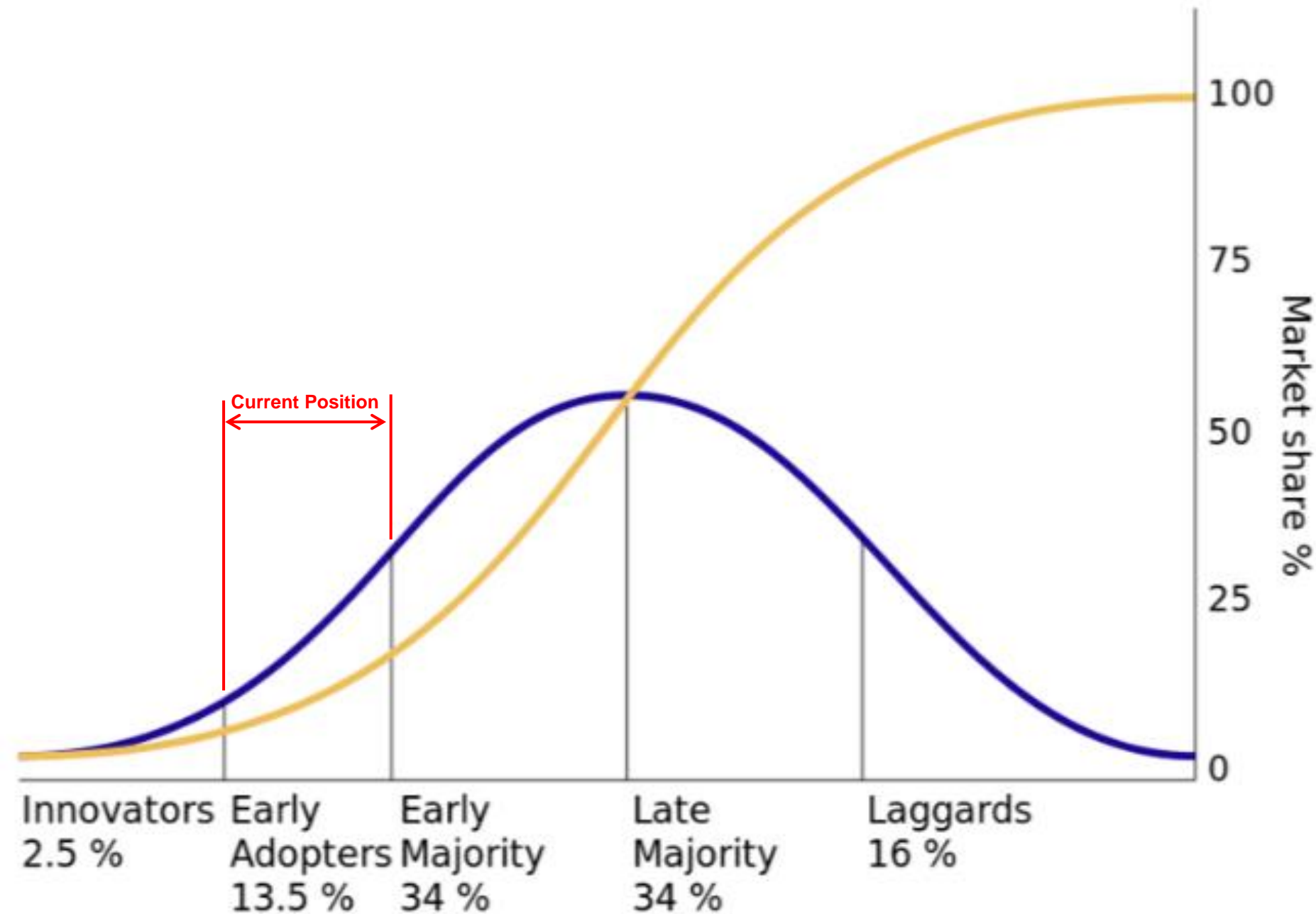
Source: NHBC, based on registrations.



2.0 So Why not?

Innovation to Adoption for New Technologies

Diffusion Adoption Curve for new MMC Technologies



Meinhardt (Singapore) research results. 2016.
As part of a research project specifically reviewing MMC Technologies

Tipping Point? Cost!

Cost

■ Public Sector

- Presumption in favour MMC “all things being equal”
- Relaxation of Local Authority housing spending cap

■ Private Sector

- Selection based on time advantages
- Traditional wins where time not a factor (residential)

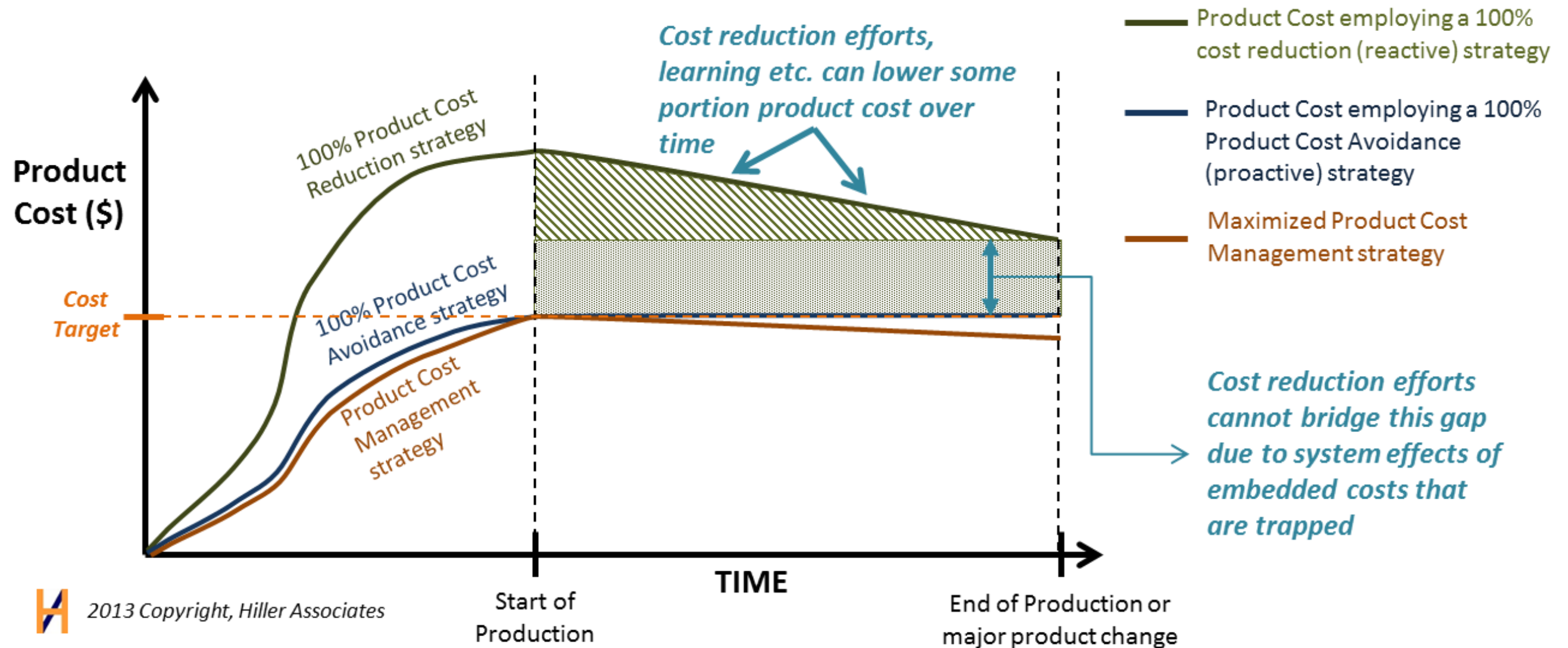
■ Industry Feedback

- High rise modular; 5% premium
- Low Rise modular: 15%

Volume=Cost Reduction

Innovation to Adoption for New Technologies

Maximizing Profit with Product Cost Management



The Value Cycle

Suppliers: Volume

- DFMA
- Building characteristics
- Specification
- Interfaces
- Connections
- Logistics

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Cost Consultants

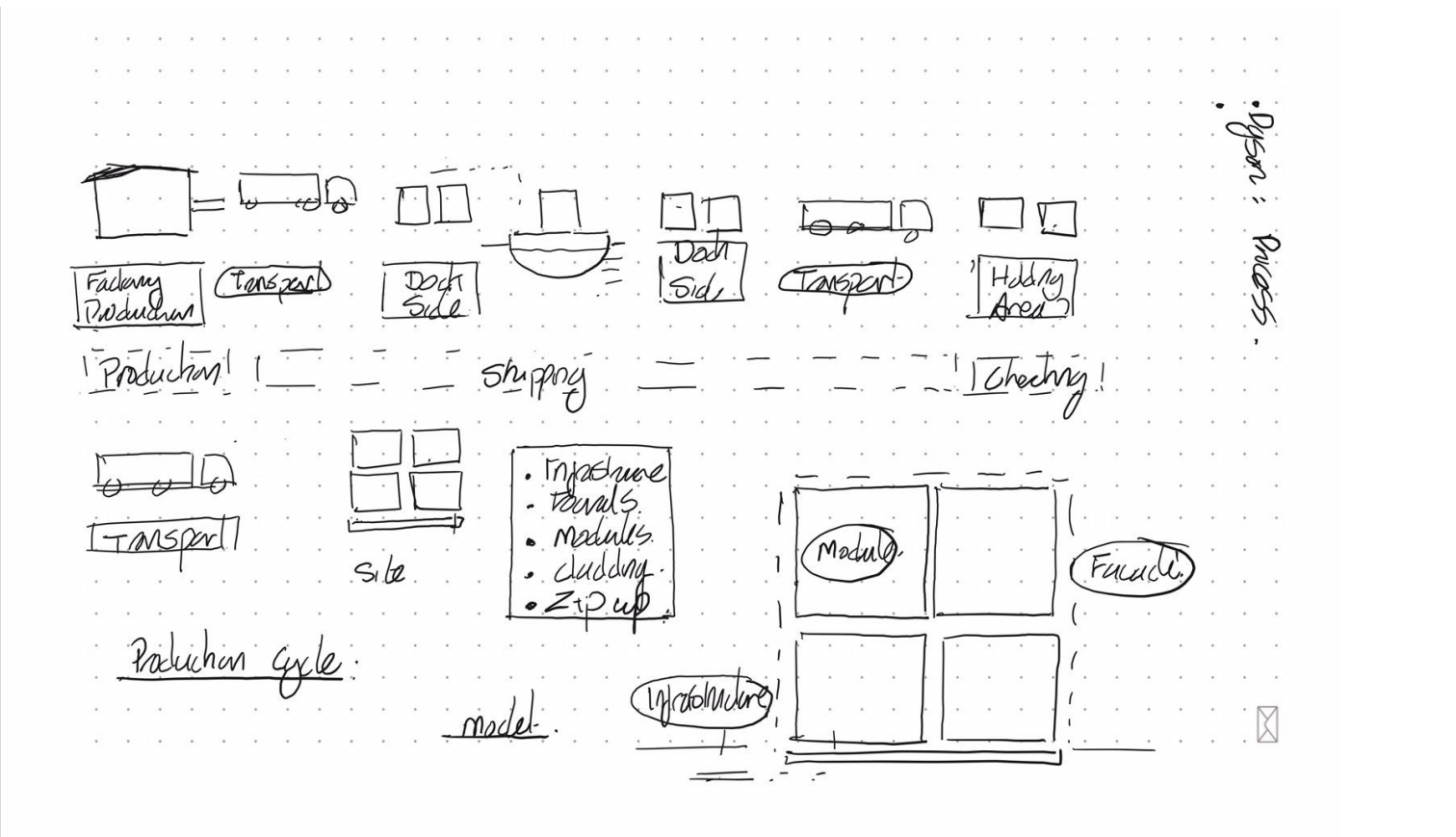
- Procurement
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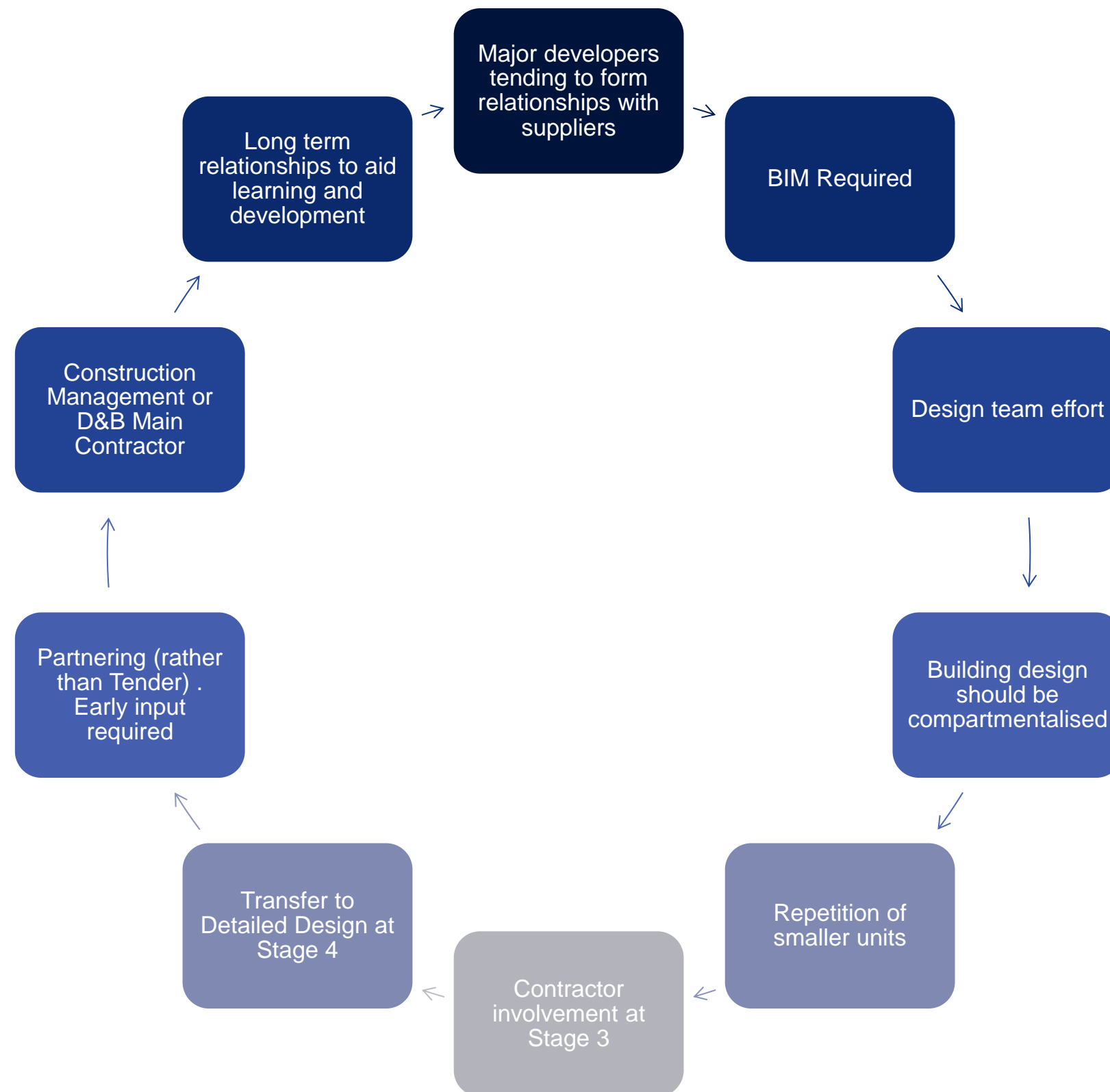
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Design & Procurement





Thank You

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