Ministry of Housing, Communities & Local Government

An Update on MHCLG MMC Working Group Activity

HBF Policy Conference

26th March 2019

Mark Farmer

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Genesis of the MMC working group

Boosting productivity and innovation: modernising the housebuilding sector

3.37 The housebuilding industry is less productive than the wider economy, partly because it has been slow to modernise and make use of more efficient and faster ways of building. By increasing innovation and making greater use of modern methods of construction[61] we can change this. Industry reports suggest homes constructed offsite can be built up to 30% more quickly than traditional methods and with a potential 25% reduction in costs.[62] They are high quality, reliable, more productive and can be highly energy efficient. They are high quality, reliable, more productive and can be highly energy efficient. They can require fewer people on site, helping to mitigate the skills shortage. Some firms are increasing their use of these methods, but we need to go further.

3.38 The industry has the potential to expand significantly, but a lack of demand from house-builders means that large firms tend to focus on manufacturing hotels, student accommodation and schools. Firms have told us that the most significant barrier to growth is the lack of a pipeline. A forward view of future orders and more information about the land available for development would allow them to secure investment to scale up production. International evidence suggests that as production increases the cost per unit falls.[62] Scaling up production would allow industry to explore and deliver efficiencies, driving down costs. In turn this will encourage more builders to use these methods as it becomes economically sensible for them to do so.

3.39 To underpin the growth of this sector we must ensure that homes built offsite can access finance on the same basis as traditionally built homes. The Buildoffsite Property Assurance Scheme, which provides assurance to lenders on methods of construction, has existed for some time but there is limited take-up among lenders, partly because of a lack of data to support them in making decisions.

3.40 We will:

- **stimulate the growth of this sector through our Accelerated Construction programme and the Home Builders' Fund**. This will create new opportunities for the use of modern methods of construction to encourage investors into the sector and give current suppliers confidence to expand into the housing market. It will also support the delivery of high quality, energy efficient homes through these programmes;
- **support a joint working group with lenders, valuers and the industry** to ensure that mortgages are readily available across a range of tested methods of construction. This will include encouraging industry and lenders to develop a stronger set of core data to measure the use and performance of different technologies to encourage good decision-making;
- **consider how the operation of the planning system is working for modern methods of construction (MMC) developments;**
- **work with local areas** who are supportive of this type of manufacturing to deliver growth, provide jobs, and build local housing more quickly; and
- **alongside the Home Building Fund, consider the opportunities for offsite firms to access innovation and growth funding and support for them to grow**.

61 Modern methods of construction include homes that are built offsite or can be rapidly assembled or use other building techniques that increase productivity.

62 Davies G (2013) Design for Manufacture and Assembly is helping revolutionise construction, making it faster, cleaner, cheaper and more reliable. *Engineering Excellence Journal* (Laing O'Rourke). And Woetzel J, Ram S, Mischke J, Garemo N and Sankhe S (2014) *A blueprint for addressing the global affordable housing challenge*. McKinsey Global Institute.

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Terms of Reference Overview (January 2018)

- *Improvement in MMC related data collection & product knowledge, its transparency & level of key stakeholder education*
- *Build stakeholder confidence via robust & unified technical assurance process for MMC & improve links to insurance & financial products*

- **With 1 overarching aim:-**

- *To enable demand led change that underpins **increased capacity** to build more homes in a more productive way **to a higher quality***

MMC Working group membership

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LABC

NHBC

BLP INSURANCE

BOPAS Buildoffsite Property Assurance Scheme

checkmate.uk.com

premier guarantee

THE Q POLICY

mtc Manufacturing Technology Centre

Building Societies Association

ABI

RICS

urbansplash

LLOYDS BANKING GROUP

UK FINANCE

Ministry of Housing, Communities & Local Government

Homes England

HBF

BARRATT DEVELOPMENTS PLC

Nationwide Building Society

Virgin money

Legal & General

buildoffsite

Construction Leadership Council

EXPLORE OFFSITE

lendlease

Lloyd's Register

Allianz

FUSION Building Systems

STEWART Milne TIMBER SYSTEMS

LAING O'ROURKE

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3 Themed Sub-Groups

- **MMC terminology, definitions and data collection requirements**
- **Better Integrated and Unified Approach to Quality Assurance and Warranty of MMC**
- **Evidence Building & Routes to Data Collection**

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MMC terminology, definitions and data collection requirements

Objectives

Agreeing a standardised definition of MMC with relevant terminologies and creating a single independently curated hub for data collection

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Focus On Definitions, Terminology & Education

- Developing ‘Future Proofed’ MMC Categorisation definition to be used by key stakeholders
- Definitions need to also be relevant from a mortgage & insurance underwriting perspective – basis for collecting future data on building / system performance and risk
- RICS to support work of group by publishing supplementary guidance note on MMC

Modern Methods of CONSTRUCTION

INTRODUCING

THE MMC DEFINITION FRAMEWORK

BUILDING TYPOLOGIES & MATERIAL GENRES

Before the categories can be examined and applied it is important to define the type of building and the material genre. The material genre is only applied to structural categories 1-4a.

BUILDING TYPOLOGY

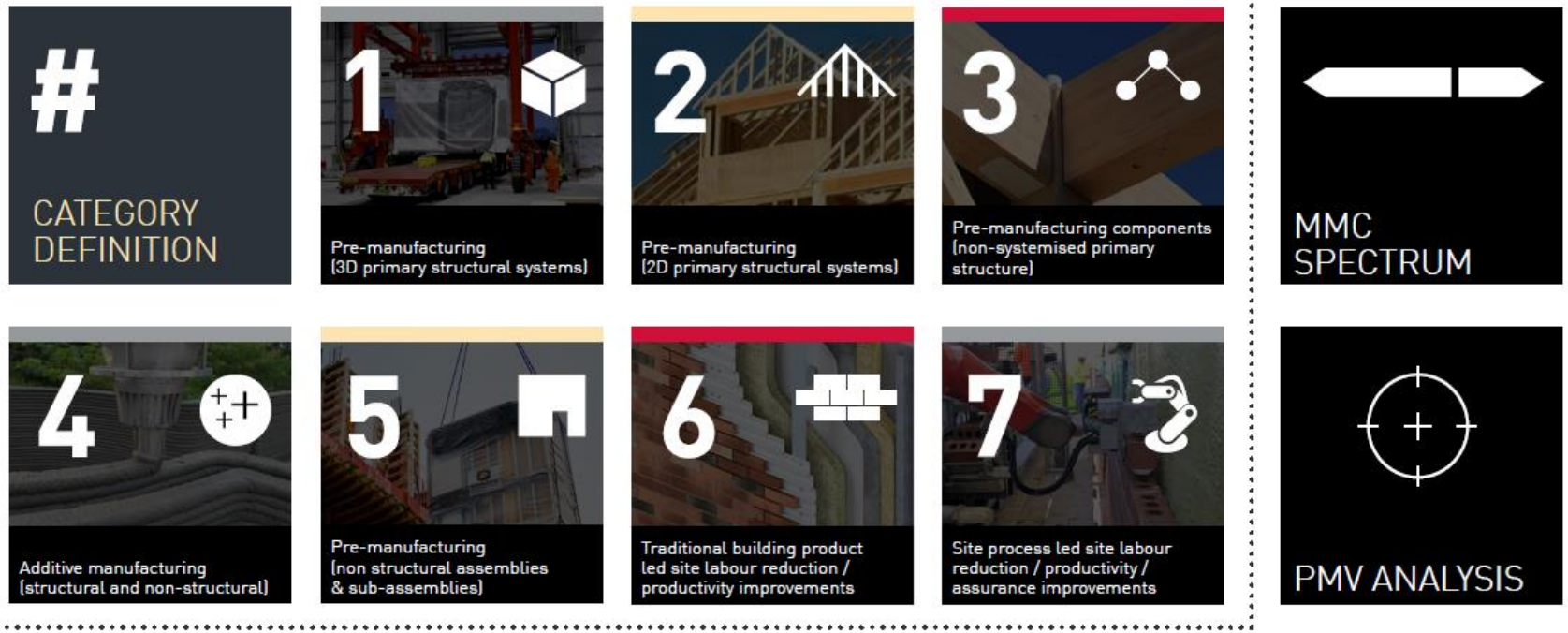
- Houses
- Low rise apartments (<5 storeys)
- Mid rise apartments (6-9 storeys)
- High rise apartments 10 storeys and above

MATERIAL GENRE

- Mass engineered timber (MET)
- Timber framed (TF)
- Light gauge steel framed (LGS)
- Hot rolled fabricated steel (HRS)
- Hot rolled / light gauge steel combination (SC)
- Concrete & cement derived (C)
- Timber framed / concrete combination (TFC)

Category DEFINITIONS

The term 'pre-manufacturing' encompasses processes executed away from final workface, including in remote factories, near site or on-site 'pop up' factories. The pass test is the application of a manufactured led fabrication or consolidation process in controlled conditions prior to final assembly / install. On-site 'workface factories' are included in Category 7).



Category 1

Pre-manufacturing (3D primary structural systems)

a. Structural chassis only – not fitted out

b. Structural chassis and internal fit out

c. Structural chassis, fit out and external cladding / roofing complete

d. Structural chassis and internal fit out
– 'podded' room assemblies – bathrooms / kitchens etc

Any of the above variants can be used in the following 3 configurations:

i. Whole building systemised

ii. Hybrid construction –
part systemised, part traditional (ie traditional core / ground floor podium)

iii. Hybrid construction –
secondary structure to enhance system performance (ie build at height)

Category 2

Pre-manufacturing (2D primary structural systems)

a. Basic framing only including walls, floors, stairs & roof

b. Enhanced consolidation – insulation, internal linings etc

c. Further enhanced consolidation – insulation, linings, external cladding, roofing, doors, windows

Category 3

Pre-manufacturing components (non-systemised primary structure)

a. Driven / screw piling
b. Pre-fabricated pile caps / ring beams
c. Columns / shear walls / beams
d. Floor slabs
e. Integrated columns, beams and floor slabs
f. Staircases
g. Pre-assembled roof structure – trusses / spandrels




Category 4

Additive manufacturing (structural and non-structural)

a. Substantive structural forms / components

b. Non structural components

Category 5

Pre-manufacturing (Non structural assemblies and sub-assemblies)

Volumetric podded assemblies

a. Whole bathroom assemblies (including enclosing structure)
b. Kitchen assemblies (including enclosing / supporting structure
c. Bathroom / kitchen combined assemblies (including enclosing / supporting structure)
d. In unit M&E central equipment assemblies (utility cupboards etc)

Panelised / linear assemblies

e. Façade assemblies (non structural) incl glazing, solid cladding, metalwork
f. Roof assemblies / cassettes – pre-finished roof sections (incl structure to support own weight)
g. In unit M&E distribution assemblies
h. Infrastructure M&E assemblies – vertical risers / main distribution
i. Infrastructure M&E assemblies – central plant & equipment
j. Floor cassettes with horizontal services / finishes added
k. Partition cassettes – with horizontal & vertical services / finishes added
l. Doorsets (pre-hung, finished with ironmongery)

Category 6

Traditional building product led site labour reduction / productivity improvements

a. Large format walling products – external walls

b. Large format walling products – internal walls

c. Large format roofing finishes

d. Pre-sized and cut to measure traditional materials – component level systemisation

e. Easy site install / jointing / interfacing features – brick slips, modular wiring, flexible pipework

Category 7

Site process led site labour reduction / productivity / assurance improvements

a. Site encapsulation measures – weatherproof and environmentally controlled enclosures

b. Use of standardised or sacrifical temporary works – modular scaffold, tunnel form in-situ concrete, insulated concrete formwork

c. Use of BIM connected lean delivery framework – digitally enabled workflow planning

d. Site worker augmentation – visual (ie AR/VR)

e. Site worker augmentation – physical (ie exoskeletons, assisted materials distribution etc)

f. Site worker productivity planning tools (GPS, wearables etc)

g. Site process robotics and drones (rebar, masonry, plastering, decorating, surveying etc)

h. Autonomous plant and equipment and drones (driverless cranes, diggers etc)

i. Digital site verification tools (photogrammetry, site worker video, LIDAR scanning etc)

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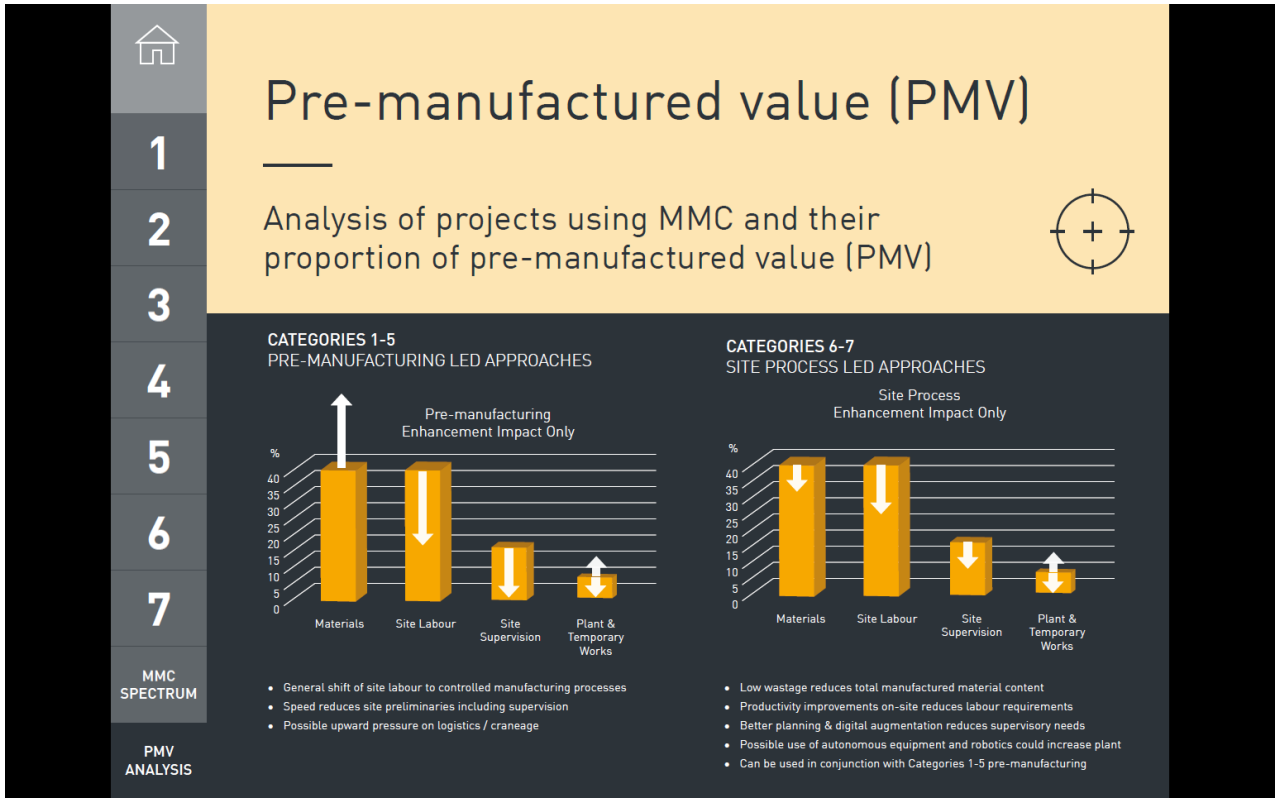
Understanding Pre-Manufactured Value (PMV)

INDUSTRIAL STRATEGY



Date	Milestone
Jul 2019	Construction Leadership Council (CLC) conducts annual review of Sector Deal implementation.
Dec 2019	Implement in full the recommendations of the Construction Industry Training Board Review (published in November 2017).
2020	Industry to increase the total number of apprenticeship starts in the sector to 25,000 a year by 2020. Develop and publish a common approach to procuring for whole life asset value, and cost and performance benchmarks for built assets. Develop standardised industry training modules in key areas such as health and safety and management and leadership.
2021	Develop and demonstrate new building designs based on digital building designs, and associated manufacturing technologies, techniques, and performance and quality standards. Deliver measurable improvements in productivity, and the level of pre-manufactured value in built assets.

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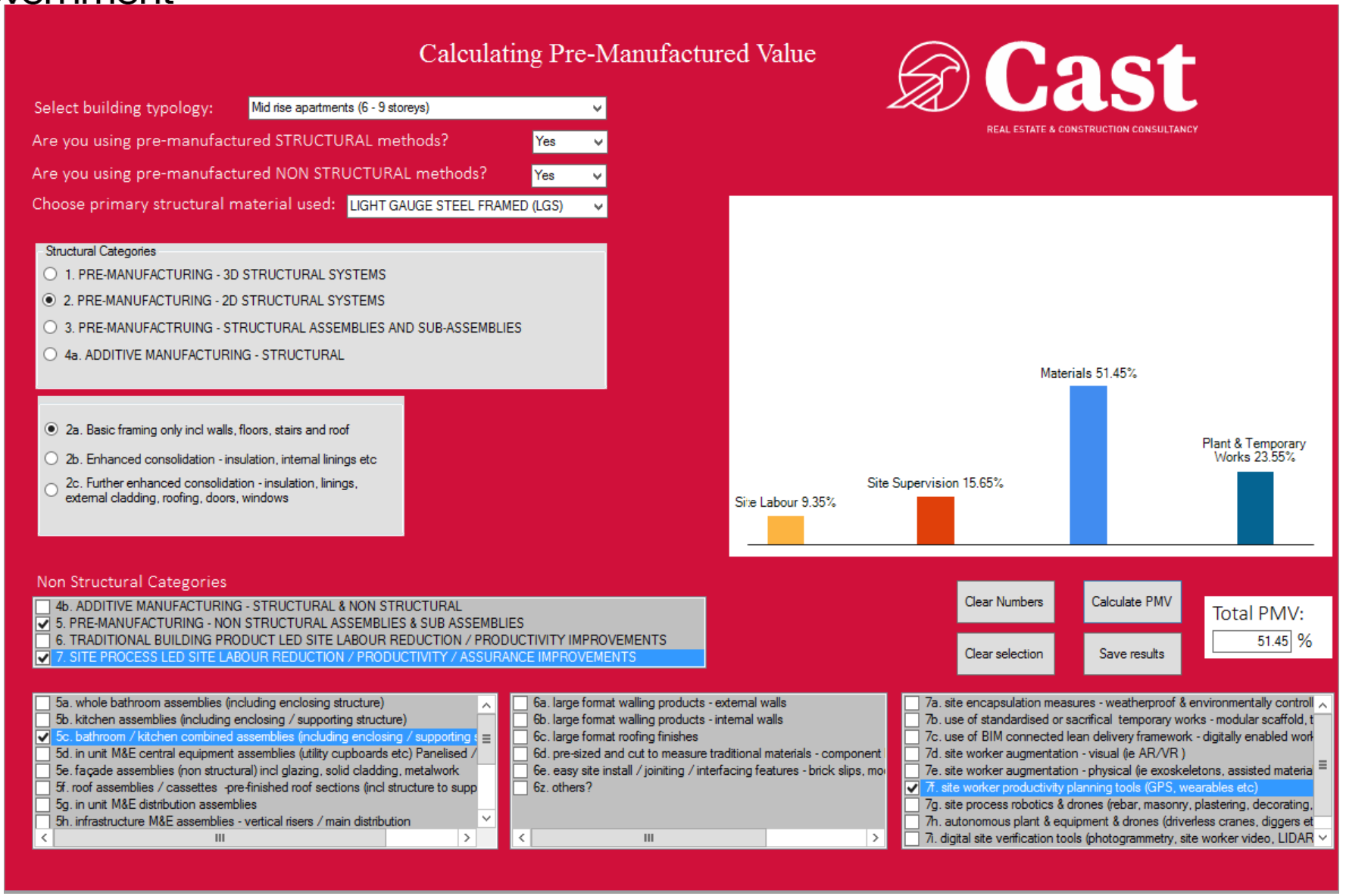
Calculating Pre-Manufactured Value (PMV)



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Better Integrated and Unified Approach to Quality Assurance and Warranty of MMC

Objectives

Develop a unified quality assurance ‘scheme’ for assessing MMC technologies. This would then act as a gateway to acceptance of the final homes for warranty, mortgage and building insurance offers

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Focus on Unified Assurance – Linking To Mortgage & Insurance Products - 10 Point Checklist

- Needs to be clear on technical longevity assurance of end product not just component parts – manufactured & site based outcomes combined
- Needs to identify complexity & abnormal cost of insurance led reinstatement plus general maintenance, repairs and conversions can be carried out – is it specialist work by manufacturer only or are repairs capable of 'open sourcing'?
- Needs to be associated with a 'mainstream' warranty
- Needs to recognise the importance of valuer advice and bring them into the heart of the solution
- Desire for a single, unified assurance platform in the UK (incl Scotland & Wales)
- Better definitions of 'MMC' needs adoption – what is it generically that we are talking about – large format masonry or innovative use of materials included or just higher levels of offsite processing and manufacturing
- Needs to be holistic in warranty terms and cover entire the off and on-site based integration process to point of completion – with a single recourse
- Product and process assurance should be better linked to people via skills & competency certification
- Need for a single open source repository / database of how all housing stock is built (linked to standard definitions and certification status)
- Better education and awareness of latest technologies – where the bar should be set in terms of quality and outcomes relative to downstream risk

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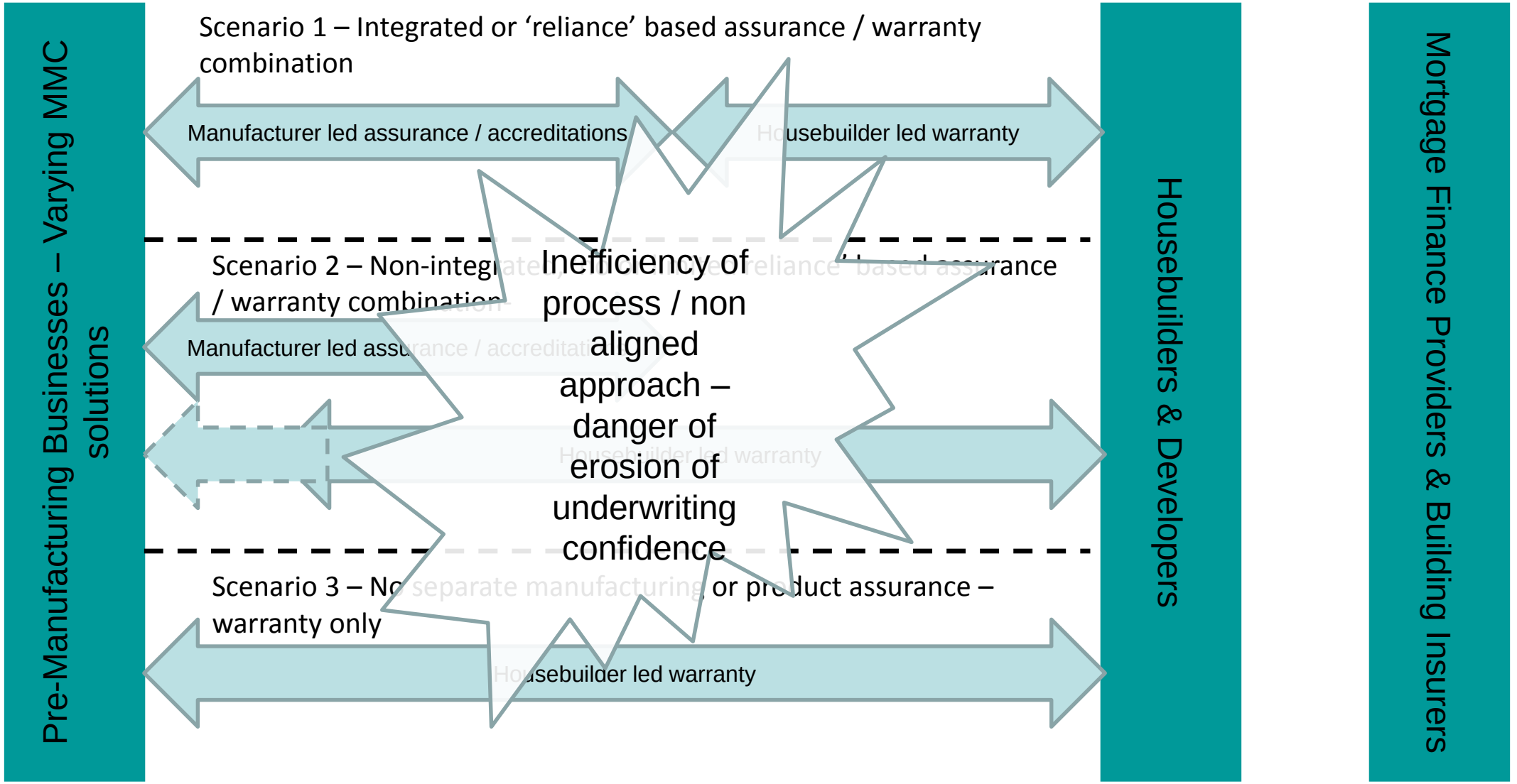
The Current Mechanics of the Assurance, Insurance & Warranty Market for MMC



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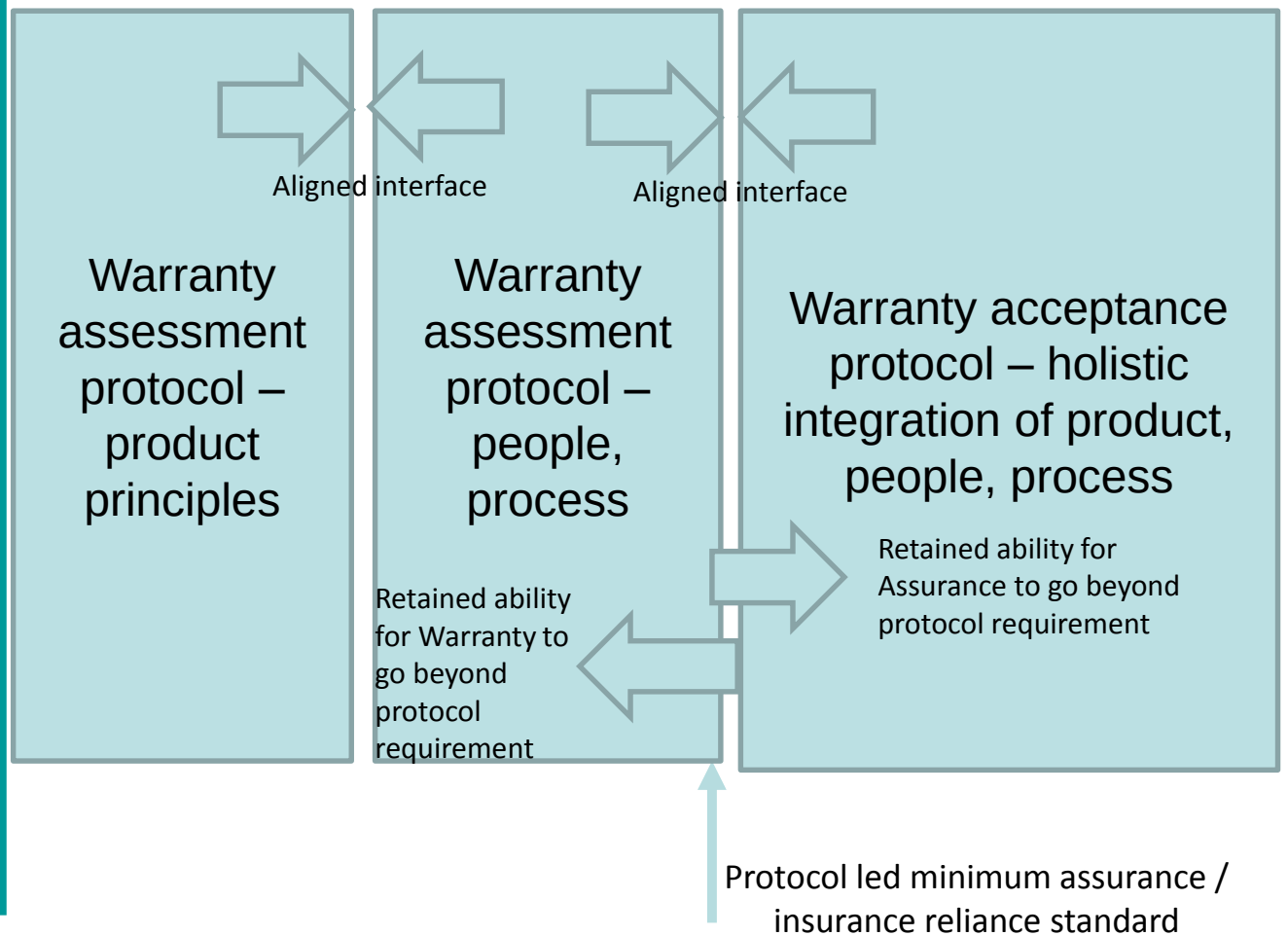
Evolved Thoughts – Warranty Assessment Protocol (WAP)

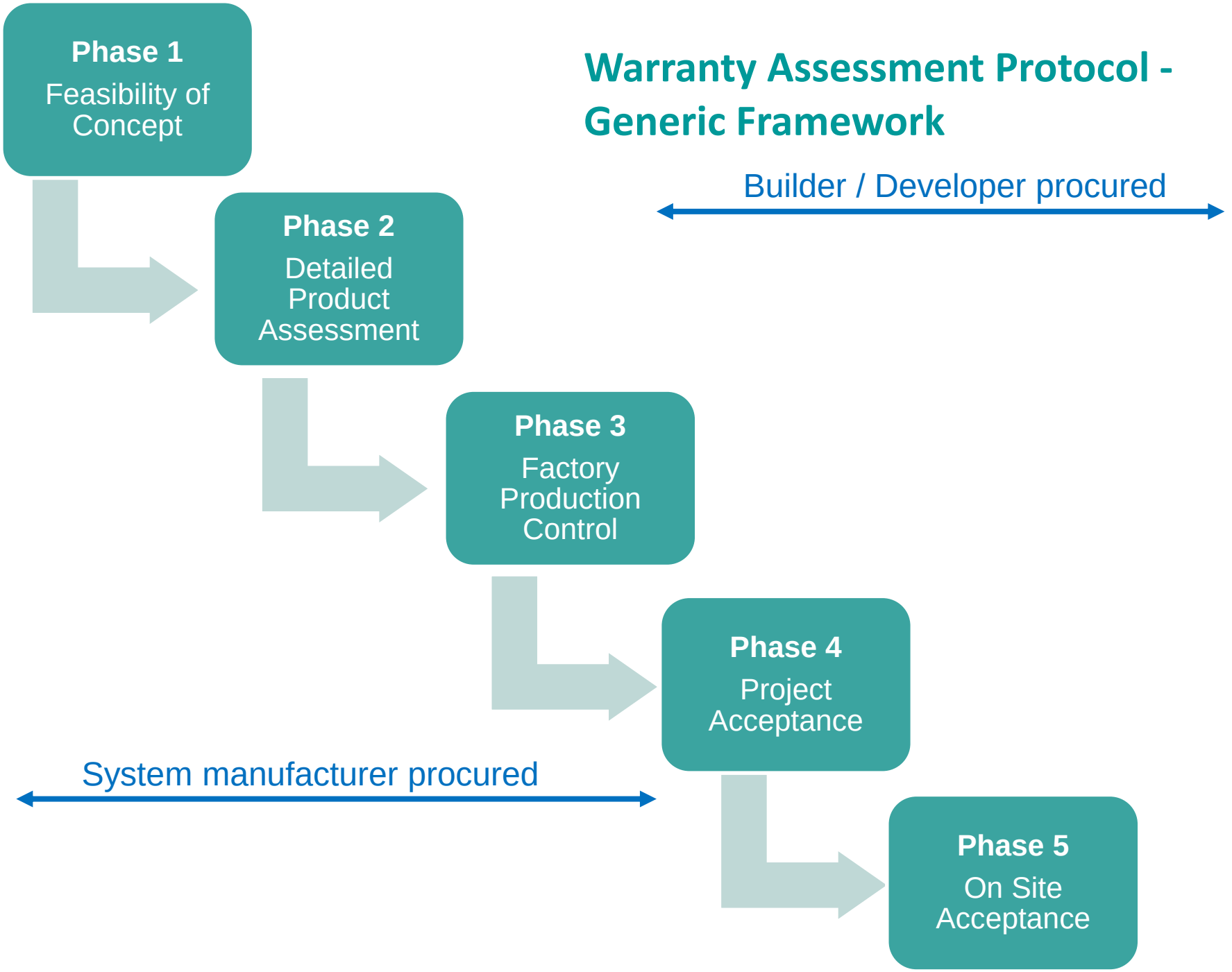
Pre-Manufacturing Businesses – Varying MMC solutions



Housebuilders & Developers

Mortgage Finance Providers & Building Insurers

Warranty Assessment Protocol - Generic Framework



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Evidence Building & Routes to Data Collection

Objectives

Evidence building and data collection including evaluation of customer satisfaction and technical performance through pilot projects

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Proposal

The need for evidence building associated with the use of MMC solutions is broad and covers a spectrum of possible intervention points at which data, knowledge and learning should be captured and shared with the wider industry, key external stakeholders and the public

The intent is that a central repository of data & evidence is curated in an independently hosted platform

As the details of the ‘MMC Scheme’ emerge, it is possible that this platform will also act as the hosting point for knowledge & data sharing

It is not intended for commercially or operationally sensitive information to be collected here; data may also be anonymised within a ‘big data’ set

The 7 Category MMC Definition can act to create structured datasets

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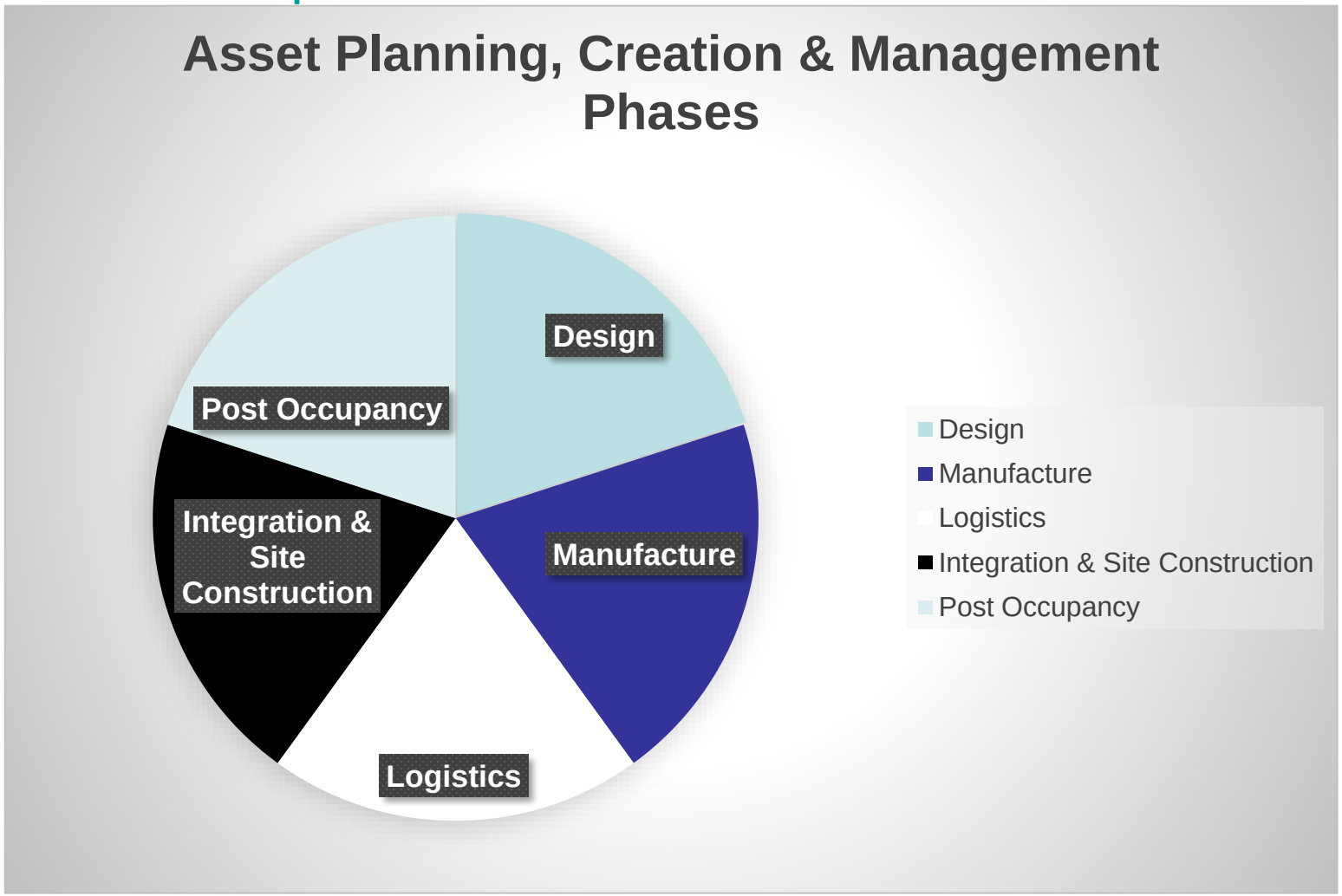
Evidence & Data Requirement



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home group

Homes England

bre

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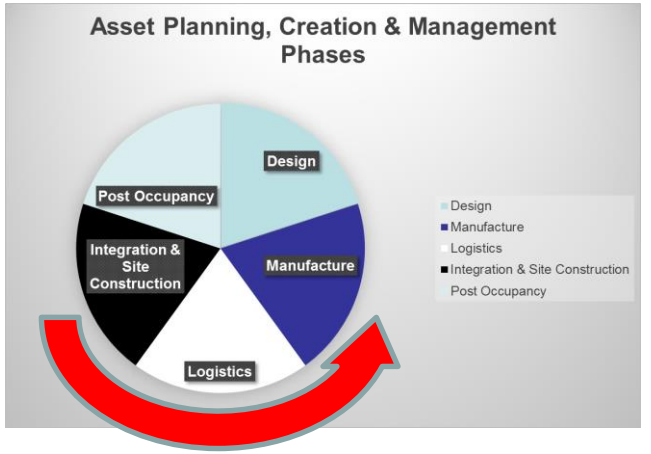
Metrics



- Construction Site Impacts
- Supplier Site Delivery Performance
- Site Installation Performance
- Responsiveness
- Defects At Pre-Delivery Inspection
- Defects At First Inspection
- Defects During Defects Liability Period
- Aftercare Service

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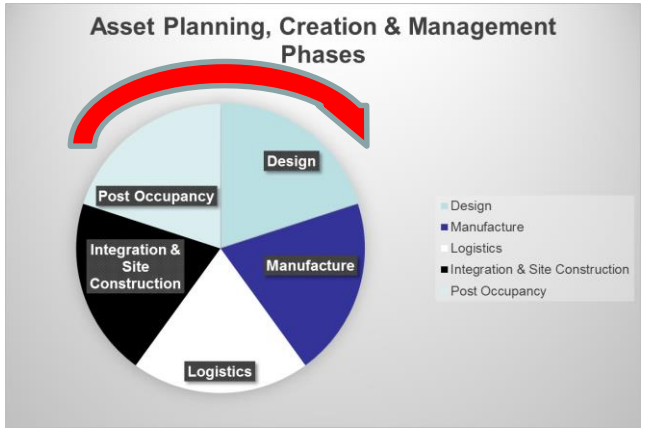

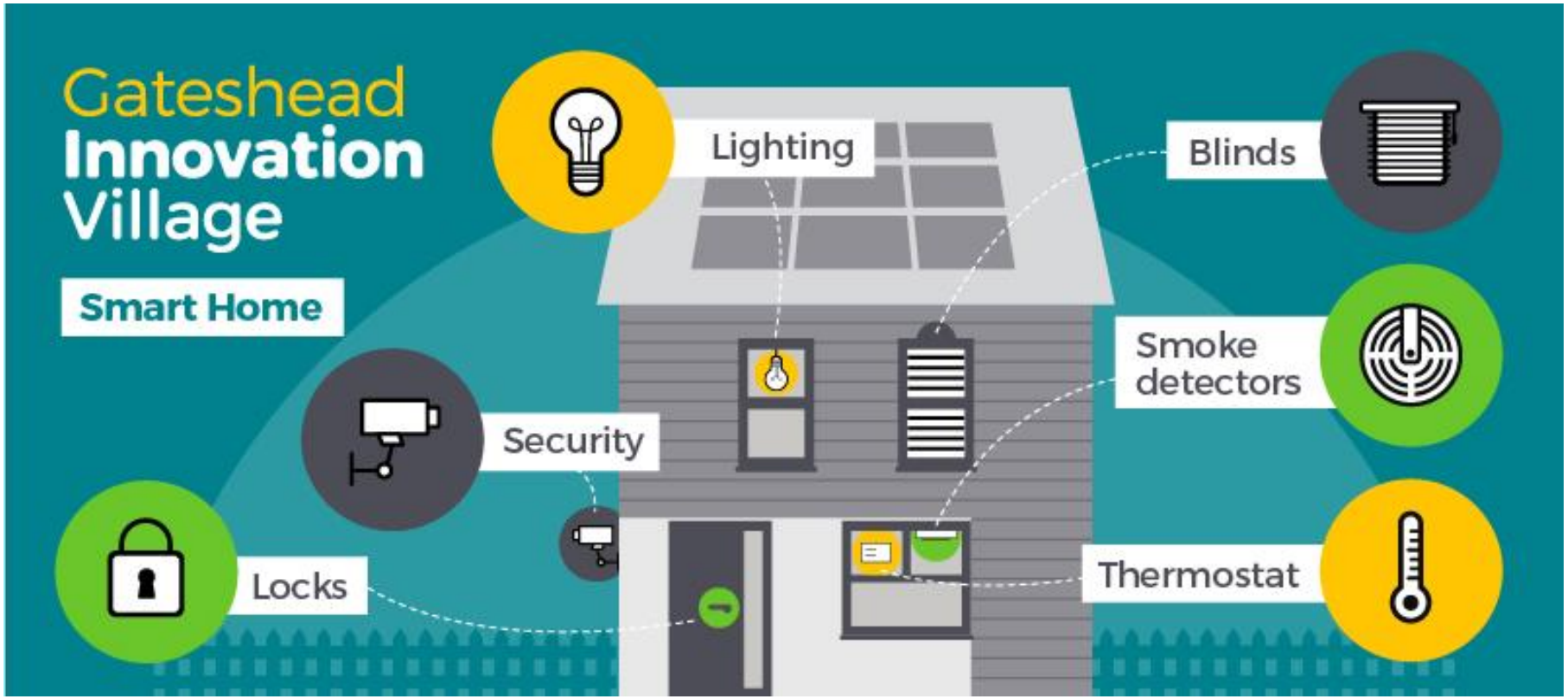

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Other Evidence Building & Data Capture Initiatives

Homes England

Research & Development Initiative

DRAFT CONSULTATION

Modern Methods of Construction Pilot

September 2018

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Press release

Homes England supports local authority deliver pilot MMC scheme

Homes England recognises the important role that modern methods of construction (MMC) have to play in delivering the homes that England needs.

Published 27 December 2018
From: Homes England

Homes England is encouraging partners to develop and use MMC through a range of initiatives and the provision of development finance.

One local authority is exploring the use of MMC to deliver homes for affordable rent through an innovative pilot scheme. Nuneaton and Bedworth Council (NBBC) has just completed its first modular build having securing £120,000 worth of funding from Homes England.

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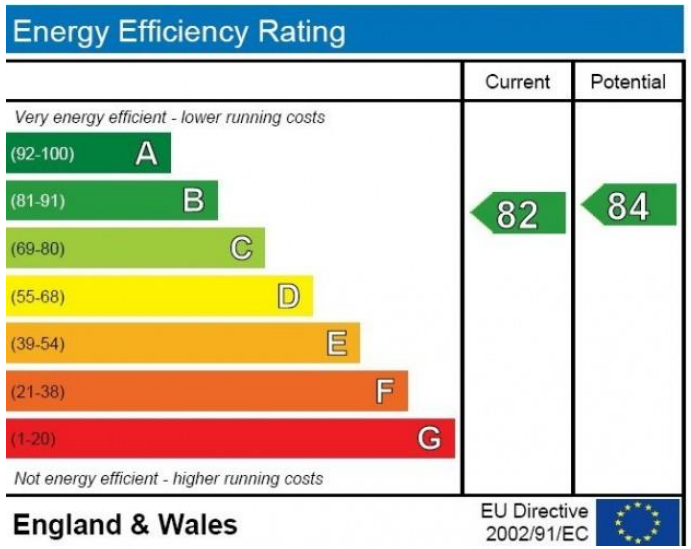
Digitalising MMC inventory on a standardised basis in housing stock – options being explored

HM Land Registry



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2019 & Beyond

Desire to keep up momentum of releasing hard deliverables that help the industry modernise at scale

All about education, confidence building & collaboration

Confidence in financial & risk underwriting needs innovation & modernisation to be absolutely led by standards & quality – MMC Scheme could be an important element of moving the dial here

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THANK YOU FOR LISTENING