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Innovate UK



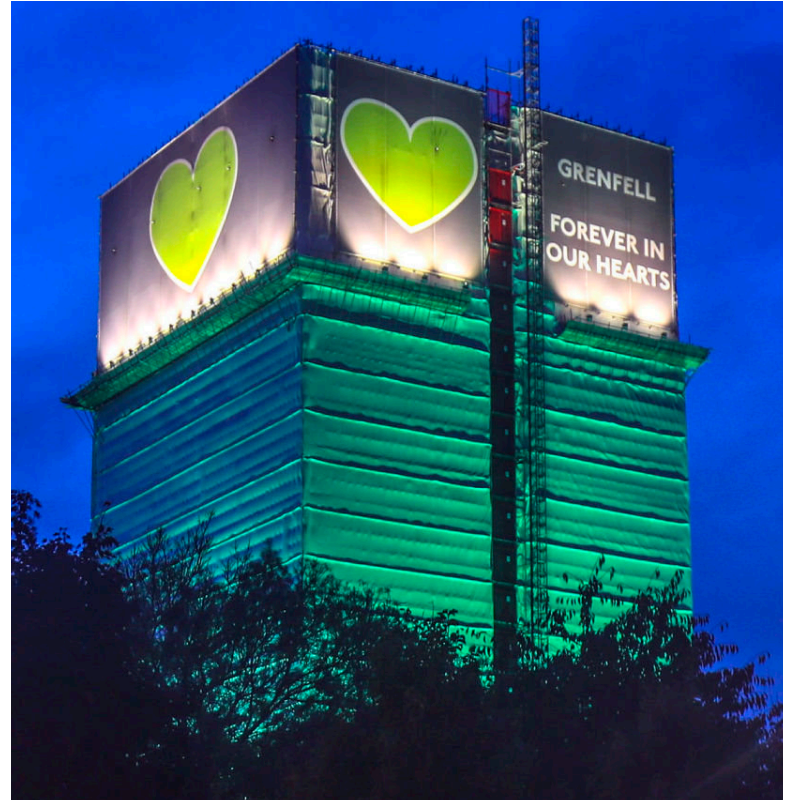
Imperial College London

SKANSKA

Why transform construction?

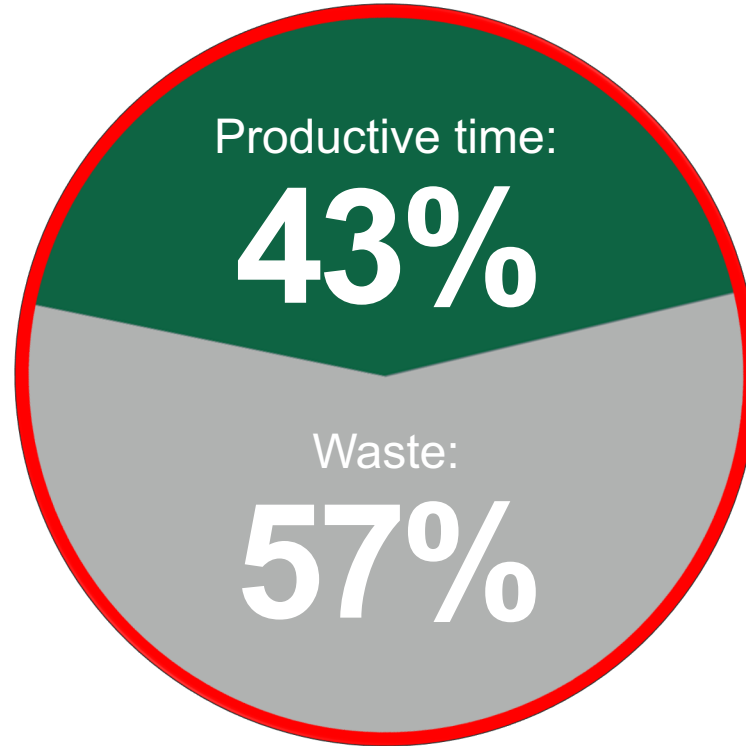
The built environment does not meet the needs of society:

- Buildings use far more energy than designed
- Contribution to UK's greenhouse gas emissions
- Costs the economy of traffic congestion
- Illnesses caused by poor living conditions
- A focus on cheapness not value

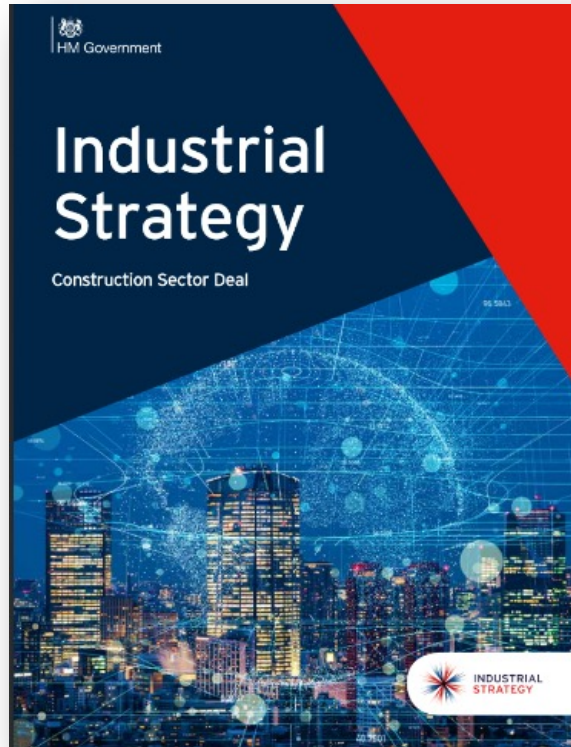


Waste

- Process waste
- Energy
- Productivity
- Materials
- Talent



Construction sector deal



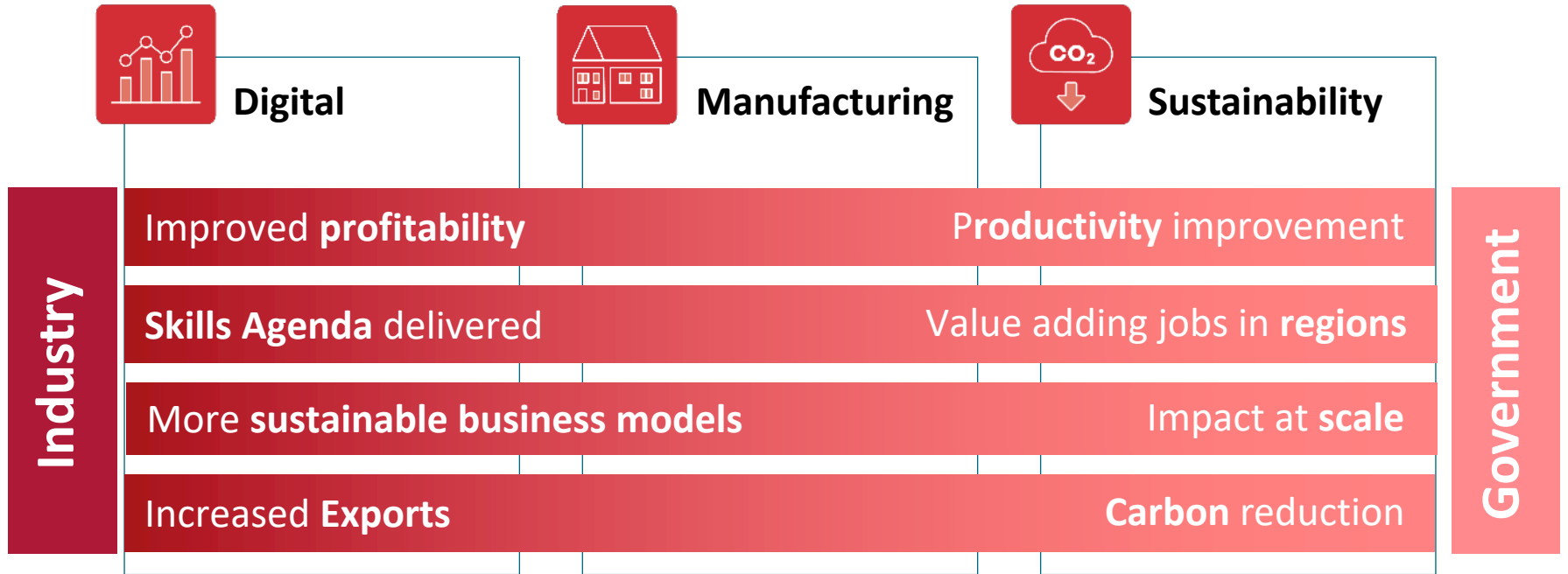
£170m
Government
funding

£250m
Matched industry
funding

4 years
of funding

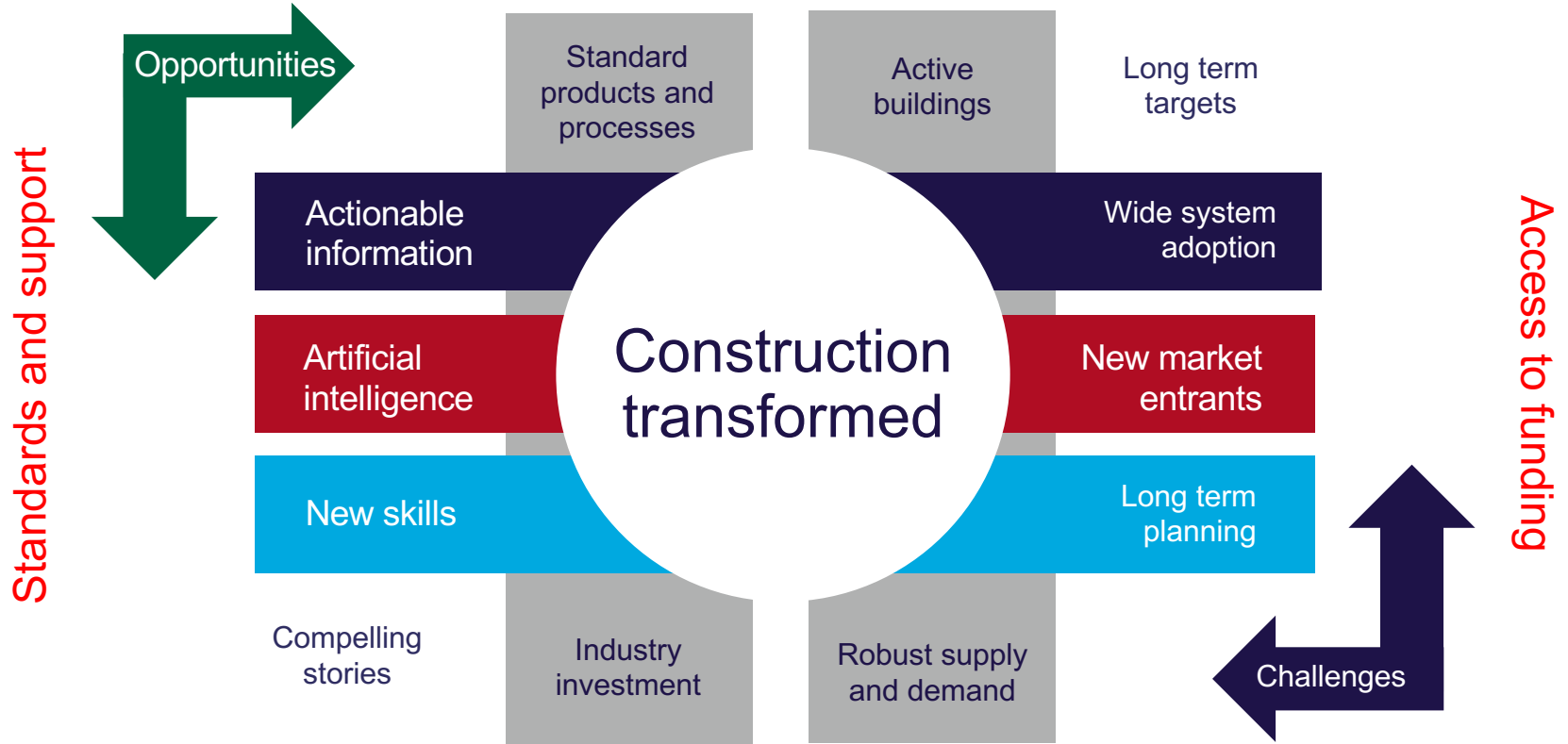
Sustainable
long-term model

Sector strategy



- * More houses
- * More rail capacity
- * Improved car journeys
- * Cheaper energy
- * Better public services

System integration



Innovation ecosystem



Academia & Research

A well funded, established academic community providing thought leadership and entrepreneurs



Progressive corporates

Innovative organisations with a desire to progress, change and disrupt



An entrepreneurial environment

A healthy start up environment with a range of companies receiving coaching, advice, appropriate IPR rules

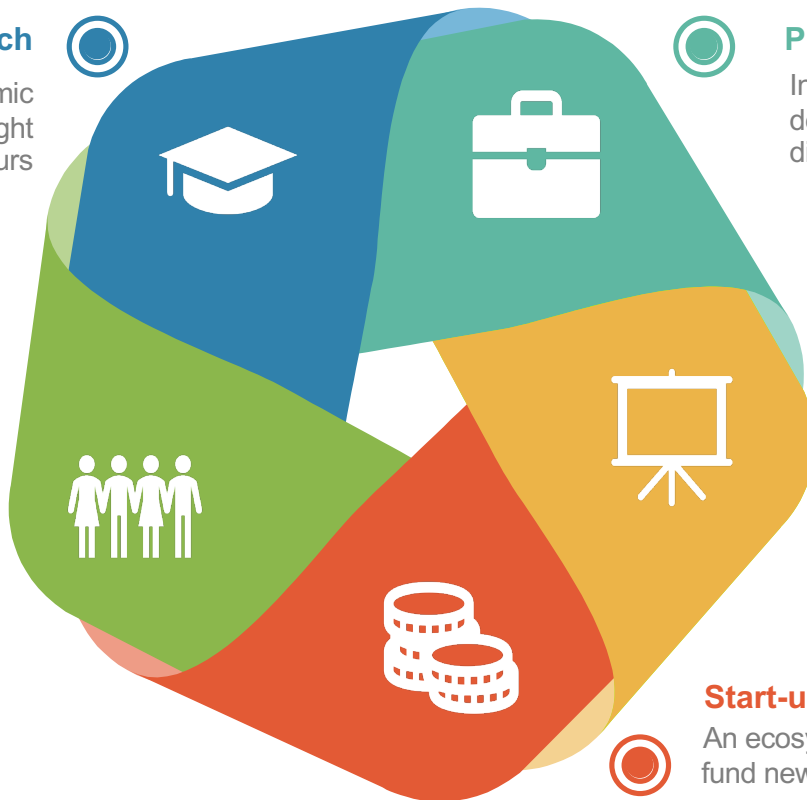


Major publicly funded initiatives

Providing significant focus, scale and buying power for growth engine to encourage change

Start-up funding model

An ecosystem of finance partners to fund new growth ideas and start ups



Foundations for radical change

Over the last four years, the Transforming Construction Challenge has:

1

Defined value and platform approach

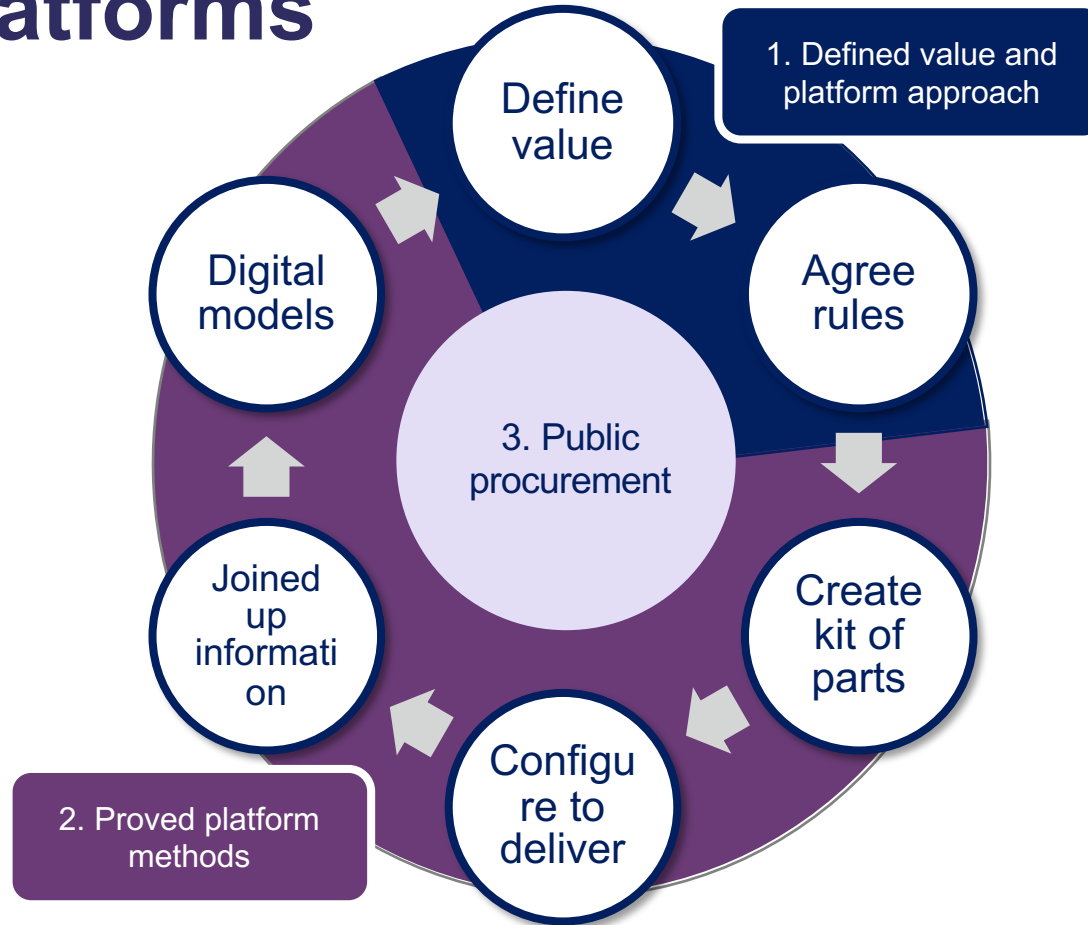
2

Proven platform methods

3

Shifted public procurement

Platforms



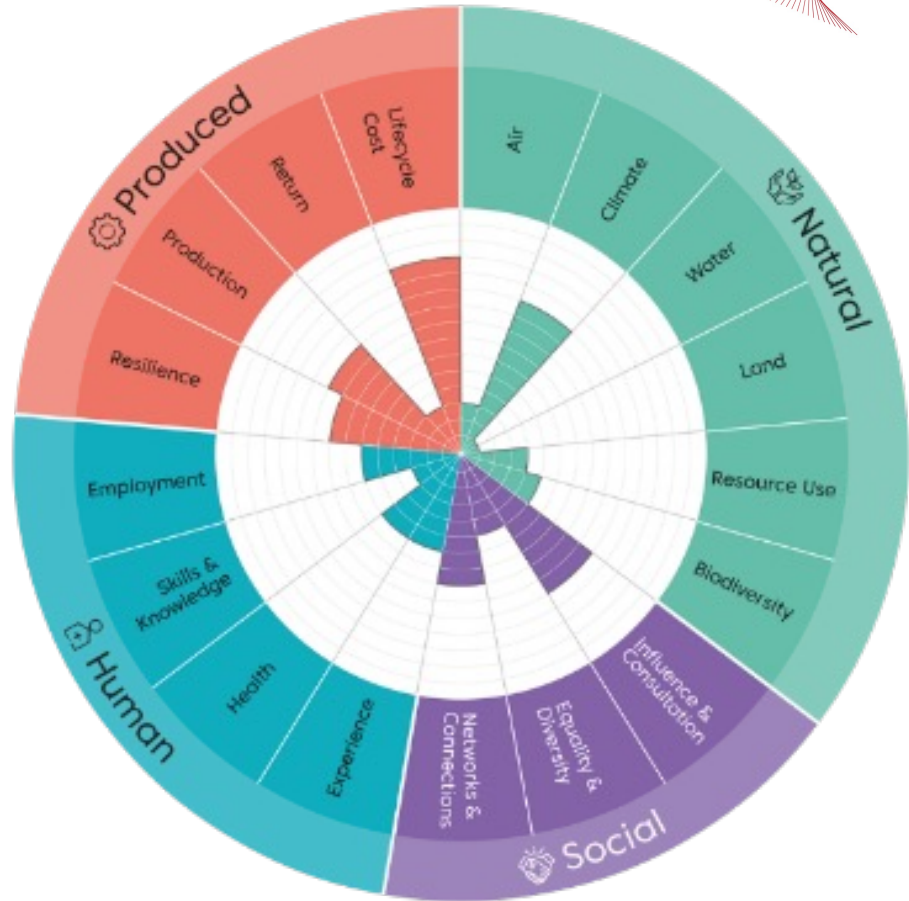
The Platform Rulebook:

A set of open-source processes, tools and guidance for platform construction.

Value

The Value Toolkit:

A series of integrated activities – supported by tools, resources, and guidance – to drive better outcomes from each investment.



2. Proven platform methods



Kit of parts
Faster delivery
50%
Lower emissions
50%
IoT

Configurator
Advanced methods
Forecast to be deployed on projects worth **£25bn** by 2027.

Digital twins
3D models
Lower costs
33%

Offsite manufacturing
Automated construction
Productivity
15%

Joined up information
Exports
50%

COLAB

Active Building Technology

- Testing, validation and configuration of clean energy technology
- Better energy capture, e.g. 67% heat pump performance improvement
- Cost effective energy storage: chemical, phase change, batteries, steam
- Labs and demonstrator projects
- Flintshire homes: 124% Part L improvement at no extra cost
- Building as power stations that trade energy

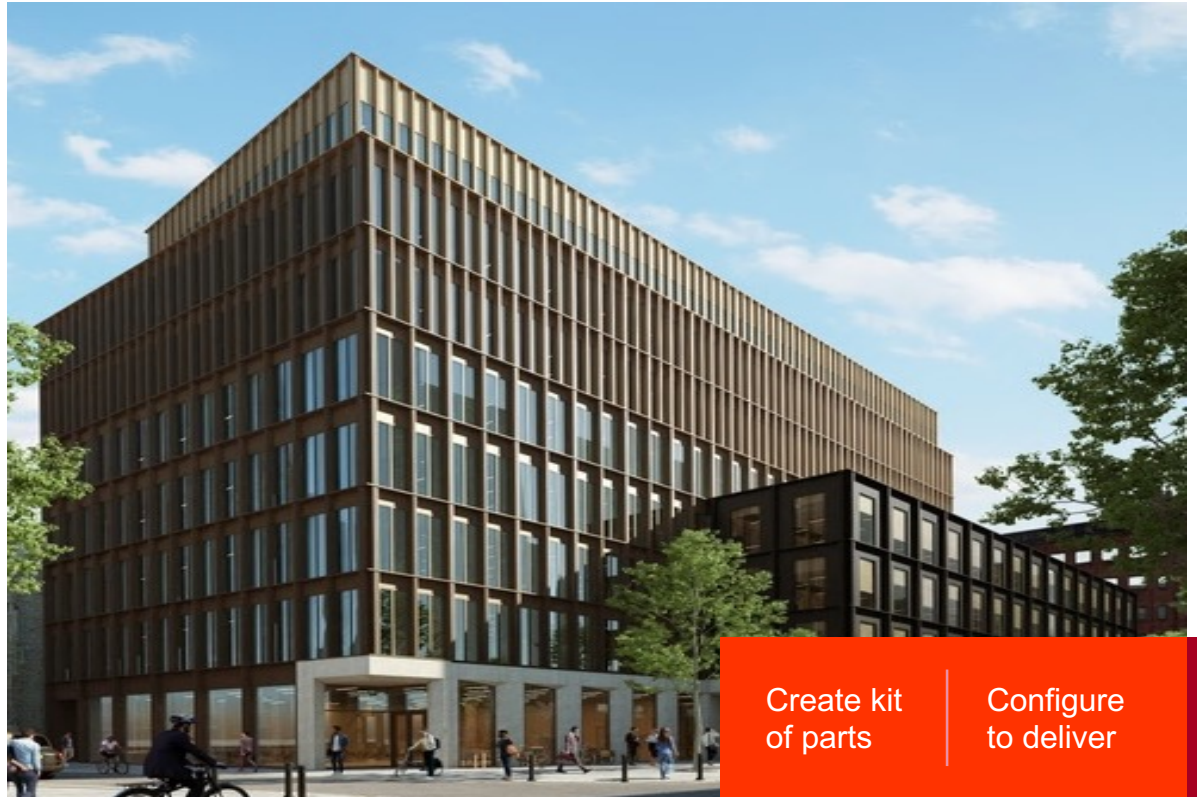


Create kit
of parts

Configure
to deliver

Automated Construction

- 10% capital cost reduction
- 30% less material cost and waste
- 15% shorter programme
- 50% fewer workers needed on site, so safer conditions
- 20% reduction in supply chain emissions
- 73% saving on energy in use
- 13.5% increase in productivity



Create kit
of parts

Configure
to deliver

Advanced Methods for Homes

- Biggest housebuilder in the UK and the second biggest social association
- Working with supply chain to test Modern Methods of Construction at scale
- More efficient scheduling & better use of workforce so that 30% more can be built
- 120 companies engaged in supply chain collaboration & sharing data across the sector
- 52% faster build than industry average (14 vs 29 weeks)



L&Q


BARRATT
HOMES

Agree
rules

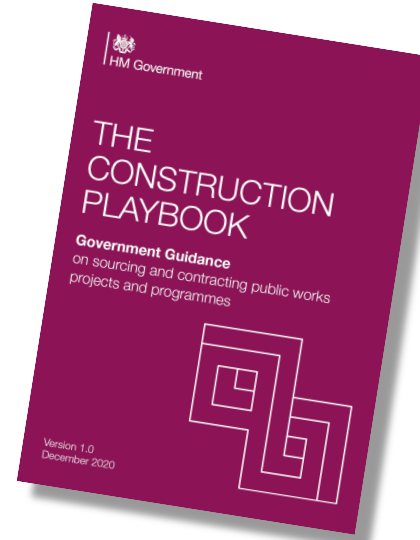
Create kit
of parts

Configure
to deliver

3. Shifted public procurement

Mandated for central government departments and arms-length-bodies, a spend of over £30bn pa:

- Set out net zero strategies and implementation plans
- Adopt the principle of value-based procurement and set targets for the level of use of modern methods
- Procure construction projects based on product platforms with standardised designs, components and interfaces
- Use quality planning processes and UK BIM Framework



Department of Education



Department of Transport



Department of Health & Social Care



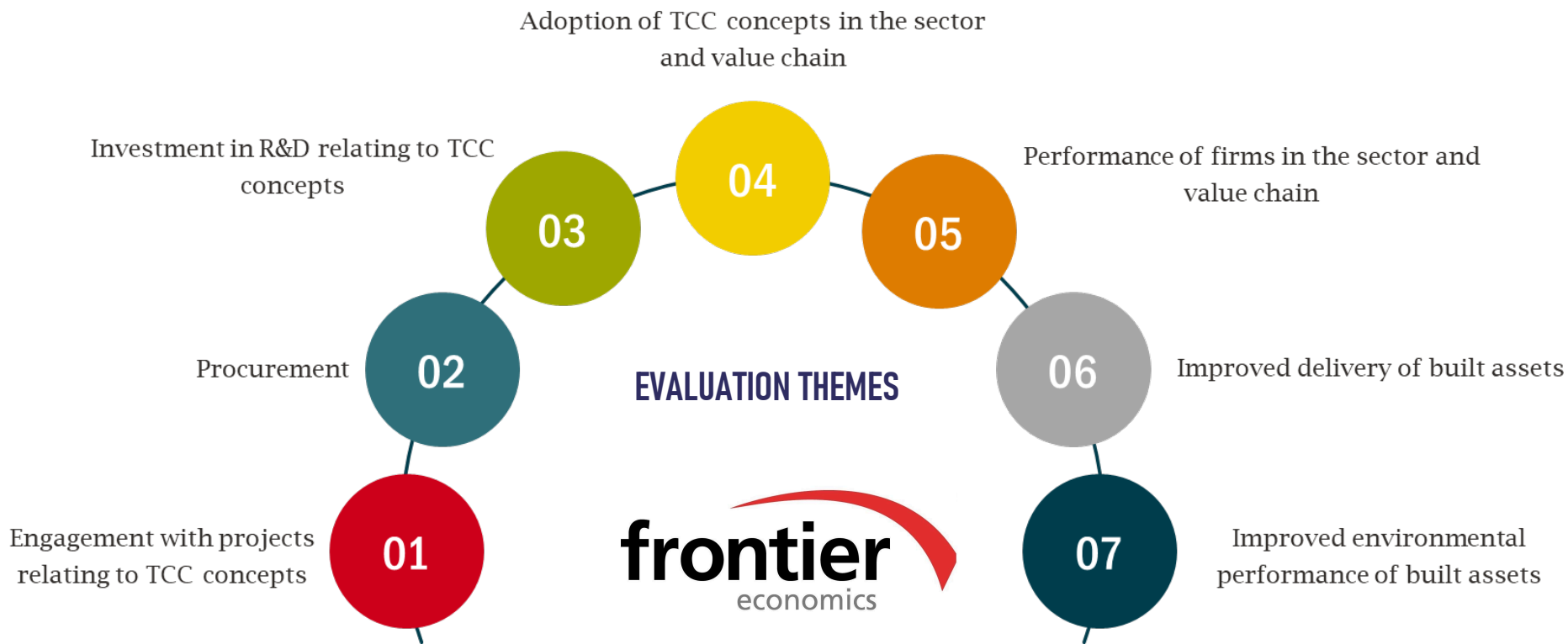
Ministry of Justice



Ministry of Defence



Independent evaluation



Improvement potential

Against a backdrop of unsustainable emissions, flat-lining productivity, high material and process waste achieve the following targets...

Quality

95%

reduction in
construction defects

Energy saving

75%

reduction in the externally
sourced energy needed
for buildings in use

Materials saving

25%

reduction in the amount of
materials used in
constructing a building

Labour saving

75%

reduction in labour
hours needed to
construct buildings

Commercial opportunity



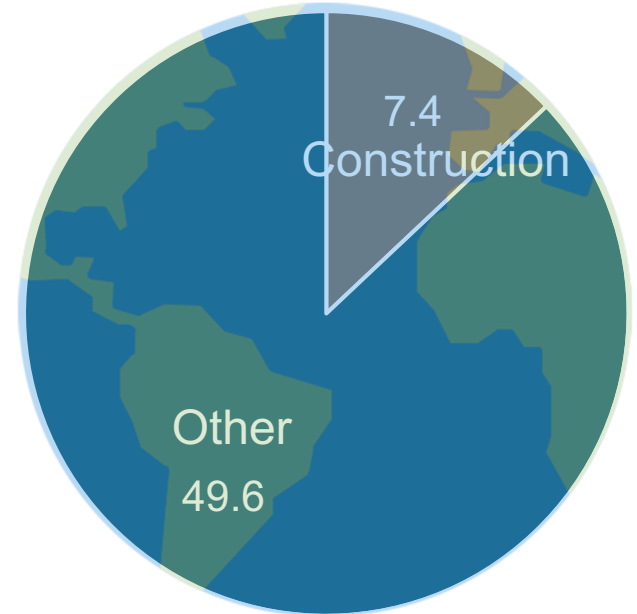
Top 10 constructors

- Market cap £125bn
- Revenue £228bn



Tesla

- Market cap £540bn
- Revenue £38bn



Gross world product £trn

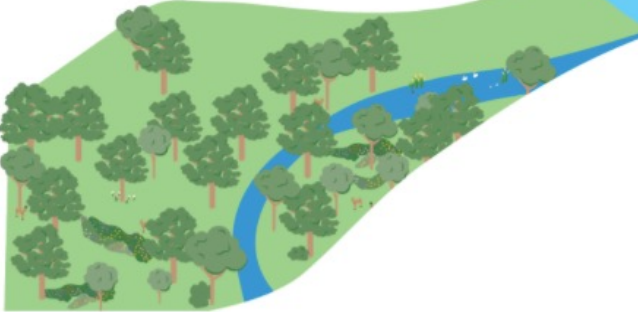
Who will win the race?



1. Middle East
2. UK
3. USA
4. Canada
5. Australia
6. China
7. Europe
8. Japan
9. India
10. Indonesia

The future

Built systems



Natural systems



Thank you



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