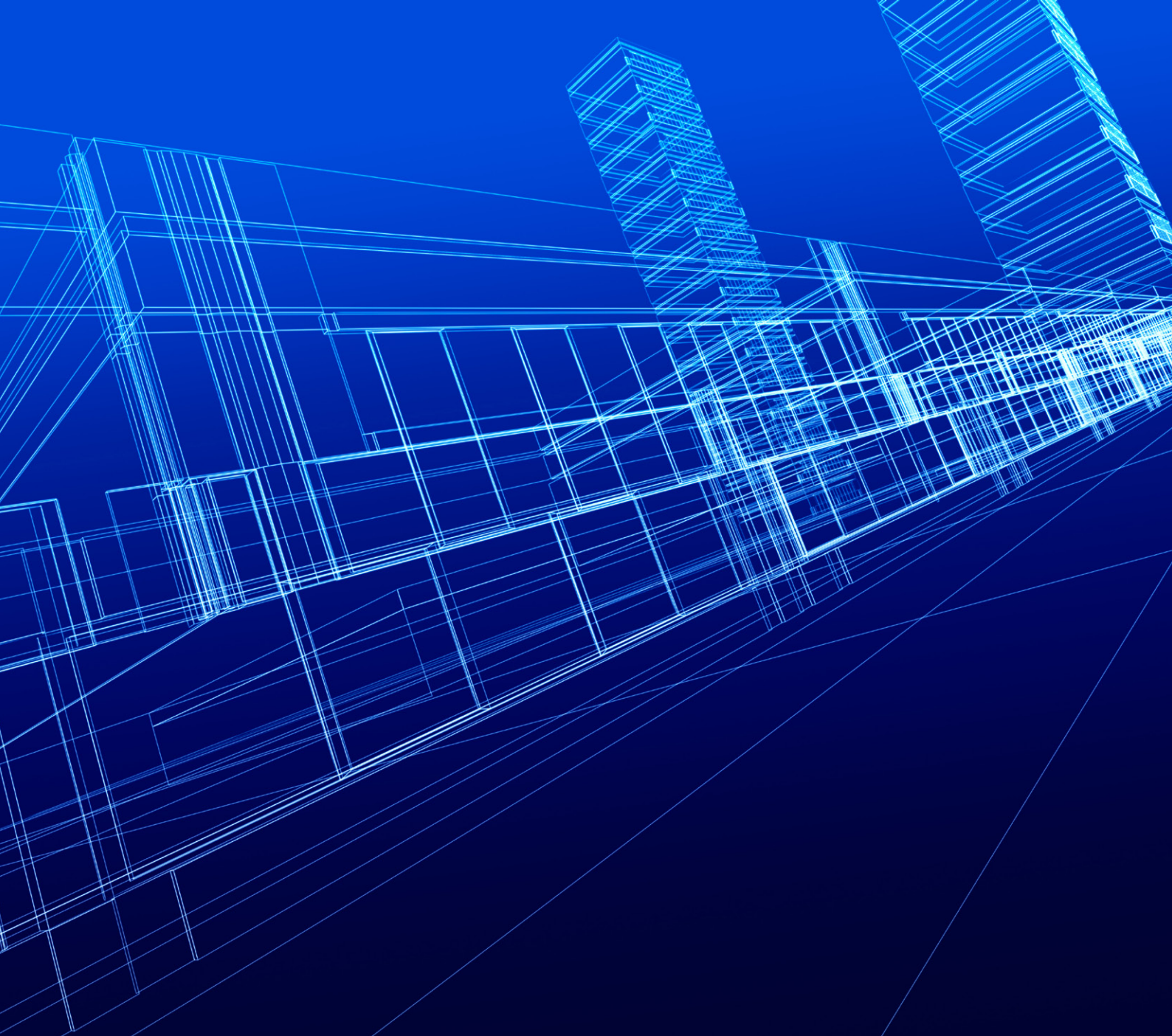


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CITB RESEARCH EXECUTIVE SUMMARY

# EVOLUTION OR REVOLUTION?





## There's a huge appetite for change in the construction industry.

There is a growing desire to use new technology to drive forward new ways of working. These will help to address a number of challenges that construction faces, including wafer-thin profit margins, recruiting, upskilling and retaining its future workforce when Brexit will make this harder, and improving mental health while continuing the gains in health and safety.

This openness to change is evident in government and industry's eagerness to explore and adopt new technology.

Ambitious plans like The Sector Deal and Project 13 signal that for many the stars are aligning, and that government, clients, contractors and other employers are committed to driving change.

Embracing digital technology and new, cutting-edge skills will benefit industry enormously. Construction is much less automated than other industries which means the opportunities presented by modernisation are a big prize.

Our recent report *Unlocking construction's digital future: a skills plan for industry* showed that digital technology and skills can significantly improve efficiency, increase productivity and widen construction's appeal to a new generation of tech-savvy young people. Digital can also help improve health and safety and the wellbeing of the workforce.

This report sets out CITB's commitment to innovation, technology and skills but takes a realistic view on the likely pace of change. Over 2018 and 2019, we will have invested over **£7m** in the skills to modernise construction. We have provided **£3.3m** in funding for Immersive Learning and **£1.5m** to develop training materials to support offsite construction. We will also be shortly launching a **£2.35m** digital skills funding commission which will equip leaders with skills to digitise their business, define and embed standardised digital competences and enable industry to deliver training and development in line with defined competencies.

We will also work closely with a range of organisations such as the Construction Leadership Council (CLC) and the Centre for Digital Built Britain. In April, the CLC will publish its Future Skills Strategy and we will be a key partner in delivering this. It's clear that modernisation is underway. However, major change won't happen overnight.

The short-term, the next five years, is likely to see technological adoption evolve (subject to economic conditions) then speed up when the seven conditions for the adoption of innovation and technology are embedded. These are: technological feasibility; relative costs of capital investment vs labour; management and

workforce capability; the level of competition; common standards for technology; demand for use of modern approaches; and levels of investment in research and development.

The report suggests that we have some way to go on a range of these conditions. It therefore suggests that 20 years is a realistic timeframe for full technological adoption across the construction industry. The report looks at a range of scenarios for the pace of change however, it's clear that the actions taken in the next five years will be critical in determining which of these paths construction follows. For innovation to grow and flourish over the next two decades a range of challenges must be met.

These include tackling a lack of common understanding on what digital construction means. Industry must be clear on its definition and the skills employees require.

Sharing best practice will be critical, as will be liberating leaders within organisations. Industry needs to give managers the freedom to take calculated risks, try new work approaches and drive digitalisation. These practices are piecemeal at the moment. Their adoption is vital because research has found a clear link between the quality of management practices, innovation, technology and productivity outcomes.

To help enable modernisation, CITB will work with government and industry to agree digital skills goals and a plan of action. We will also drive new, genuinely exciting initiatives in our funding commission.

I hope you enjoy reading our report and that it is useful for your organisation. I look forward to working with you on the digital challenges and opportunities ahead.

**Steve Radley**

Director of Policy, CITB



## AIM OF THIS REPORT

This report analyses the conditions needed for the UK construction industry to adopt innovation and develop future skills. Technology has the potential to disrupt every part of the construction industry.



**Social media** can better communicate new construction techniques.



**Sensors** can improve the efficiency of facilities management.



**Offsite** construction can simplify the house-building process.



**Augmented reality** and **virtual reality** can create new learning environments.



**Building Information Modelling** is changing how people think about design.



**Drones** can support site-management.

However, our report also found that the rate of progress will depend on:

- Addressing the fact that employers have differing views on how innovation and technology will play out in the future.
- Ensuring that the skills system supports new working practices.
- Investing to improve the quality of management which has a key influence on driving innovation, the uptake of technology and higher productivity.



# SCENARIOS – THE PACE OF CHANGE

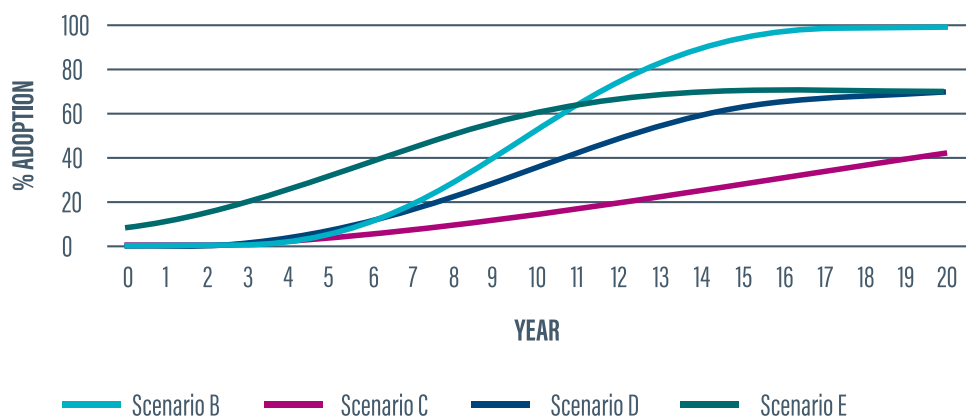
This report analyses scenarios for the construction workforce between now and 2030.

Based on stakeholder consultation and desk research, we judge that progress will accelerate over the next year five years but full adoption across the sector will take two decades. However, the progress we make in the next five years will set the pace for the following 15.

At the lower bound, given their complexity, construction technologies are unlikely to be adopted as fast as, say, smartphones or social networking, both of which saw widespread adoption in less than ten years.

The following diagrams illustrate rates of technology adoption; the employment impact of technology adoption; and the occupational impact of offsite construction. All of the scenarios show a relatively slow short-term rate of technological adoption before the adoption curves rise after year five. The actions taken in the next five years will be critical in setting the future pace of change.

## Possible rates of technology adoption



**Note:** Scenarios are modelled on change from baseline

### Scenario B: Disruption.

Radical projections of automation and technology adoption.

### Scenario C: Evolution, not revolution.

Impact of moderate automation and technology adoption.

### Scenario D: Evolution/Disruption Mix.

An intermediate scenario halfway between B and C.

### Scenario E: Ongoing automation.

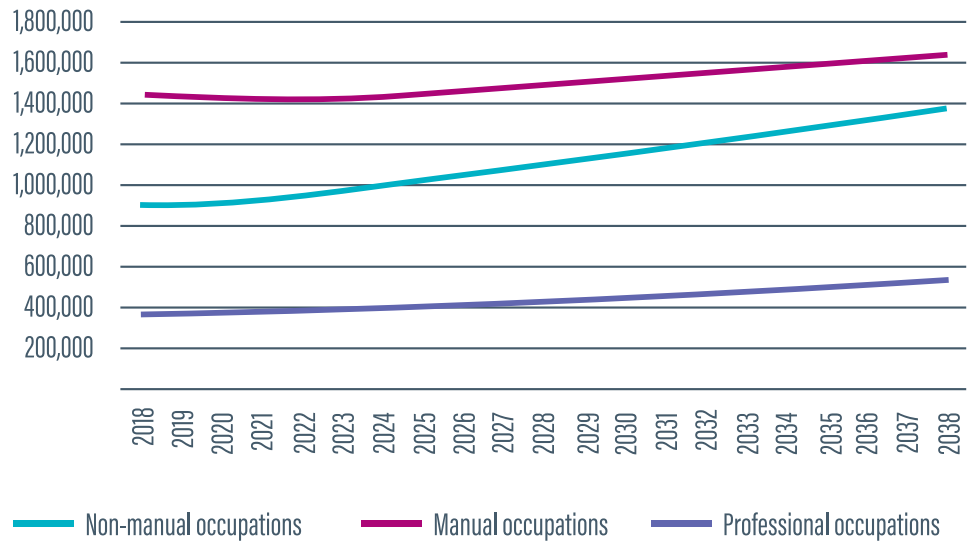
Automation already under way ramps up in coming years.

# SCENARIOS - THE PACE OF CHANGE

## Baseline employment assumption:

Growth manual, non-manual and professional occupations as sector grows in output.

### Forecasted employment growth: Baseline

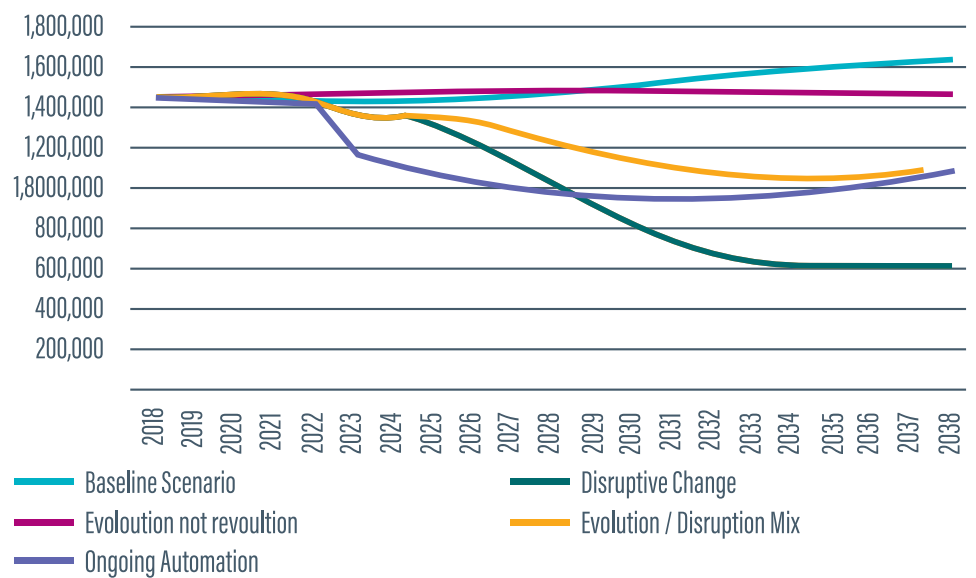


## Technology adoption:

Non-manual and professional occupations only slight changes under different Scenarios.

Main change is manual occupations and chart below shows potential impact of Scenarios on manual occupations.

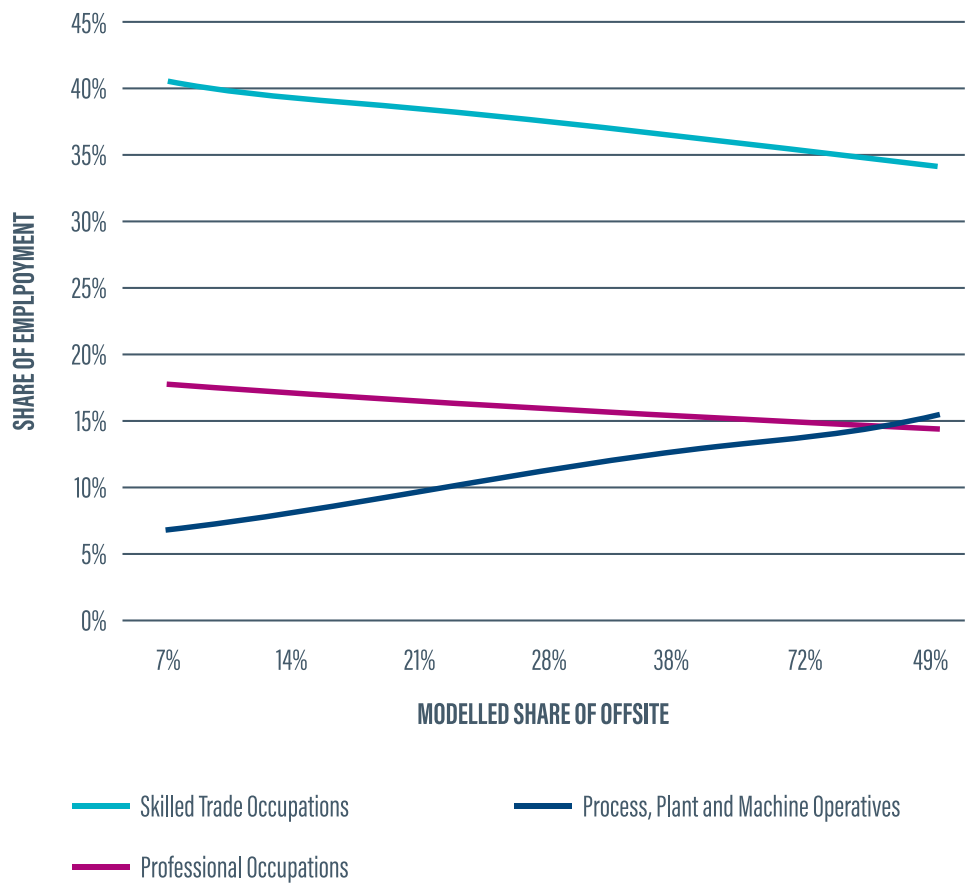
### Employment impact of technology adoption: Manual occupations



Compared profile of manufacturing and construction sectors to estimated impact that increasing offsite could have. Current estimate is less than 10% of construction output is offsite. As construction's share of offsite increases, employment increases in process, plant and machine operatives; with a decrease in skilled trades and professionals, however:

- Offsite, and future site-based skilled trades might not be the same as the current skilled trades.
- Process, plant and machine operatives – likely to be a very big difference between what this means in a manufacturing and construction context. Larger impact would be combination of offsite with increased use of automated technology.

## Employment impact of technology adoption: Increasing offsite share



We are supporting construction to develop the skills required to reap the full benefits from investing in technology through our three industry priorities of careers, standards and qualifications and training and development. In this report we have highlighted some of our key investments to support this. The forthcoming CLC Future Skills Strategy will provide more details on how the industry will take this work forward.

## ABOUT THIS REPORT



Study prepared by Policy Points and Public First from a commission by CITB.

### About the Construction Industry Training Board (CITB)

CITB is the Industrial Training Board (ITB) for the construction industry in Great Britain (England, Scotland and Wales). CITB ensures employers can access the high quality training their workforce needs and supports industry to attract new recruits into successful careers in construction. Using its evidence base on skills requirements, CITB works with employers to develop standards and qualifications for the skills industry needs now, and in the future. CITB is improving its employer funding to invest in the most needed skills and by making it easier for companies of all sizes to claim grants and support.





## CITB RESEARCH

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