McKinsey & Company

Delivering on construction productivity is no longer optional

Summary of findings

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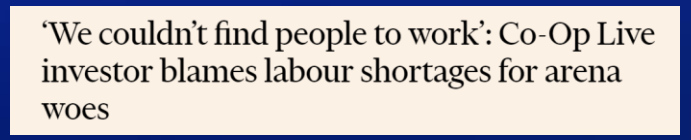
Pressure is mounting to increase our pace of construction …

- Financial Times, 17th July 2024

- The Wall Street Journal, 23rd January 2024

- CNBC, 6th June 2024



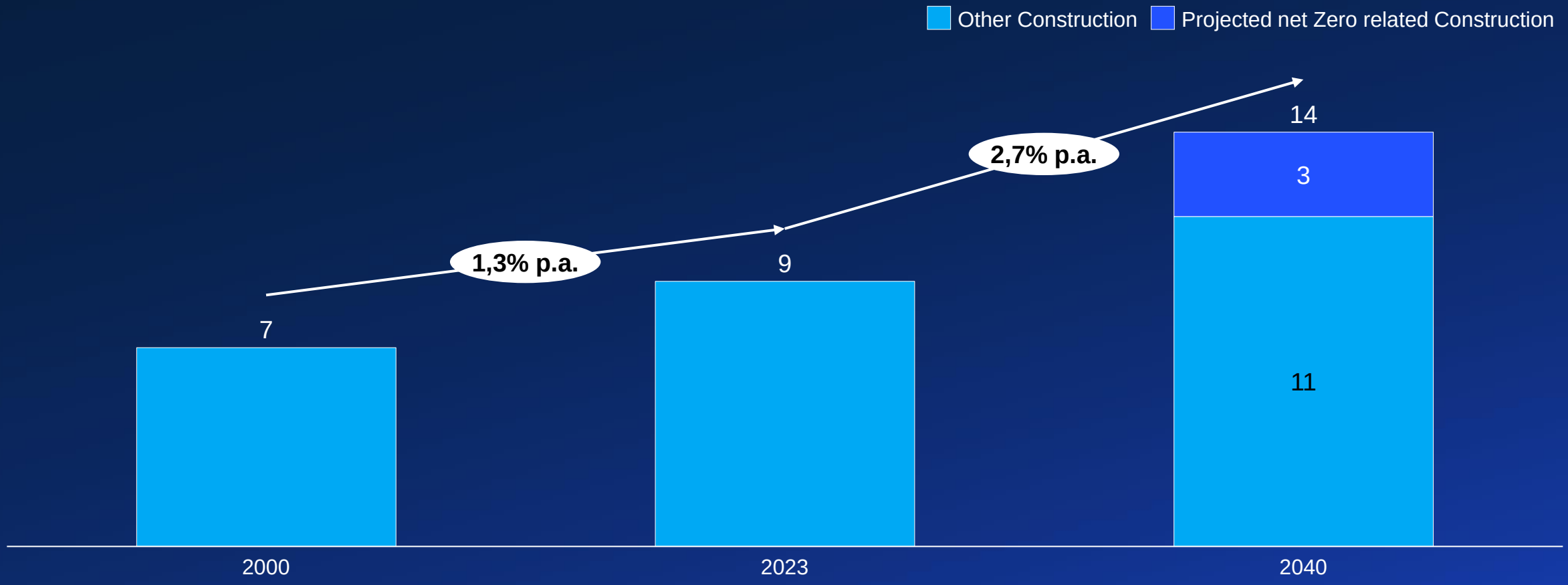
- Financial Times, 14th May 2024

- CNBC, 29th July 2023

- BBC News, 8th December 2023

In the next years, construction has to double it's growth to ensure meeting the projected needs

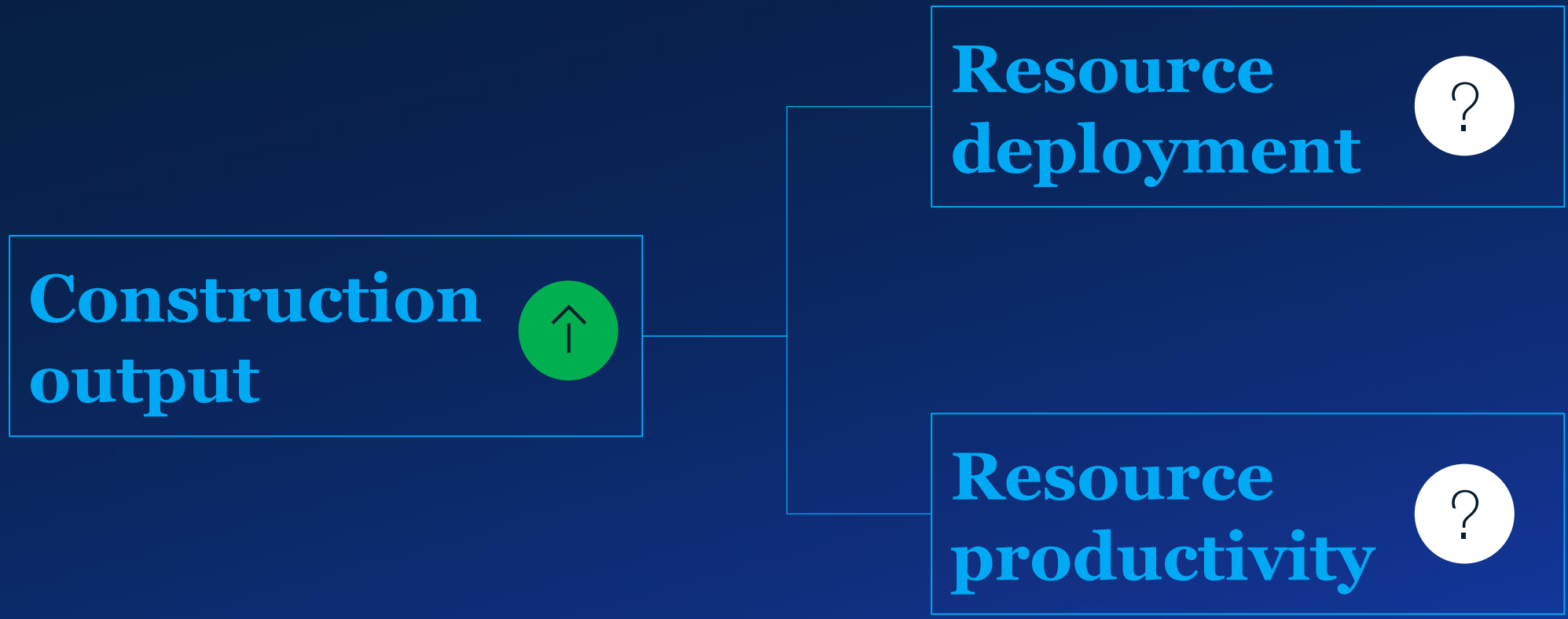
Annual construction output (global excluding China),
2000-2023 and 2023-2040 ($tr real 2019)[1,2]



1. IHS Markit
2. McKinsey Global Institute net-zero estimates, assuming all net-zero capex in power, buildings, fossil fuels, and industry directed to construction (and not to machinery and other physical assets), conversion rate from sales to VA for net-zero projected from IHS Markit estimates for construction

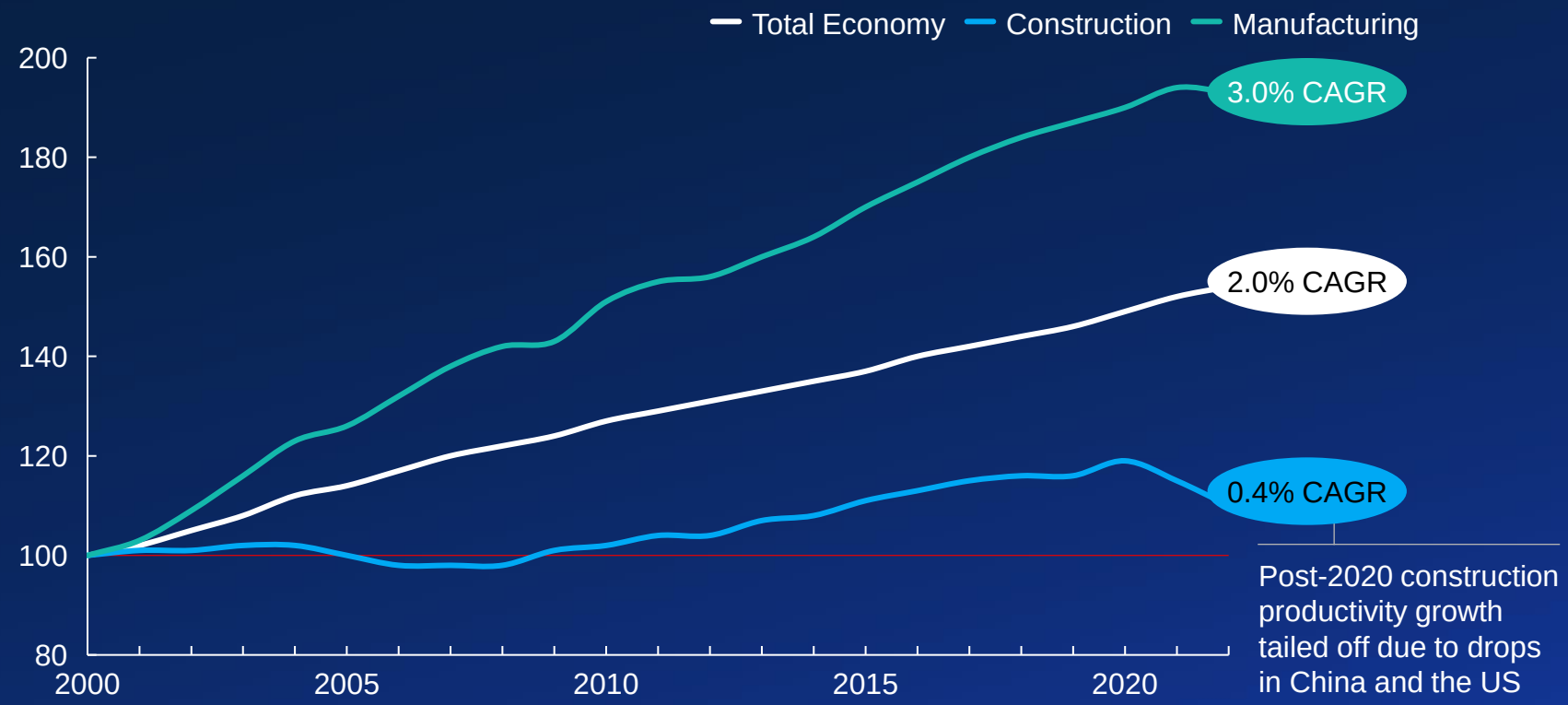
Note: estimates calculated according to 10 largest economies in terms of construction (~69% of global output) and generalized across global economy

In simple terms, increasing construction output will come from increasing resource deployment and/ or resource productivity

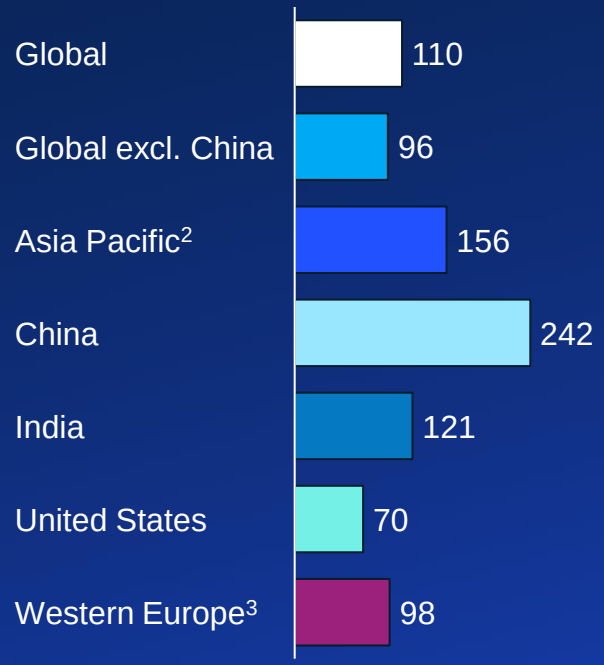


Construction productivity has continued to lag

Real gross value added per hour worked (global)[1]
Index; 2000=100



Construction productivity
2022[4] relative to 2000



1. Includes 42 countries with sufficient data availability, that account for >90% of 2022 construction VA
2. Asia-Pacific: Australia, China, India, Indonesia, Japan used as a proxy.
3. Western Europe: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom
4. Latest data (2021) used for Asia Pacific, China, India

Source: OECD; ILO, World Bank; local statistics agencies, McKinsey analysis. Methodology: Sectors as defined by ISIC classifications. Productivity indexed as cumulative sum of YOY percentage changes for individual countries pro-rata to VA share

In developed countries, overall and construction workforce growth is slowing down

Labor workforce (15-64) growth[1]

Index 2000-2040, 2000=100

X.X% Labor force outlook CAGR,2022-2040 (World Bank) **X.X%** Historic construction labor force CAGR, (2013-2018)

Labor force historic — — Labor force projection[2] Construction labor force historic

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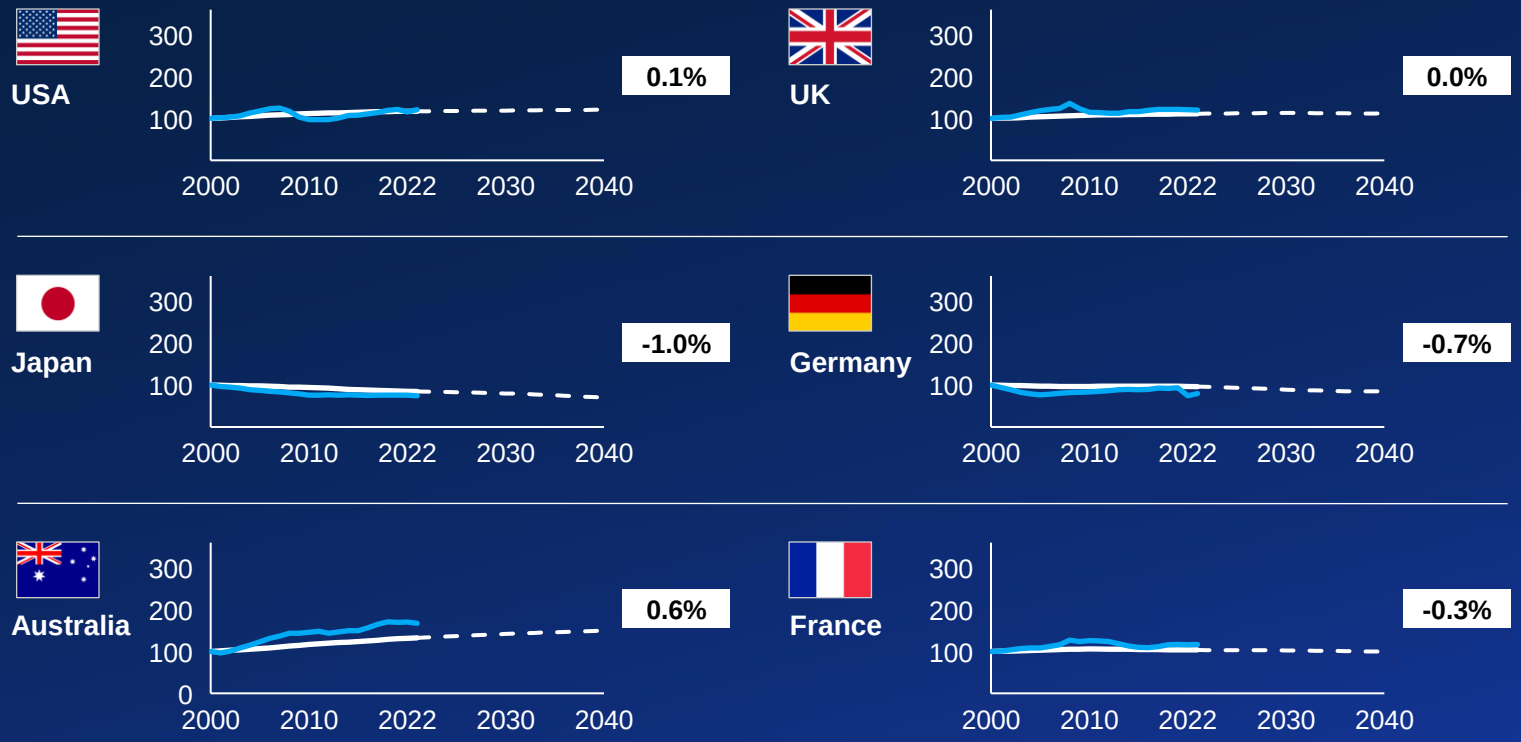
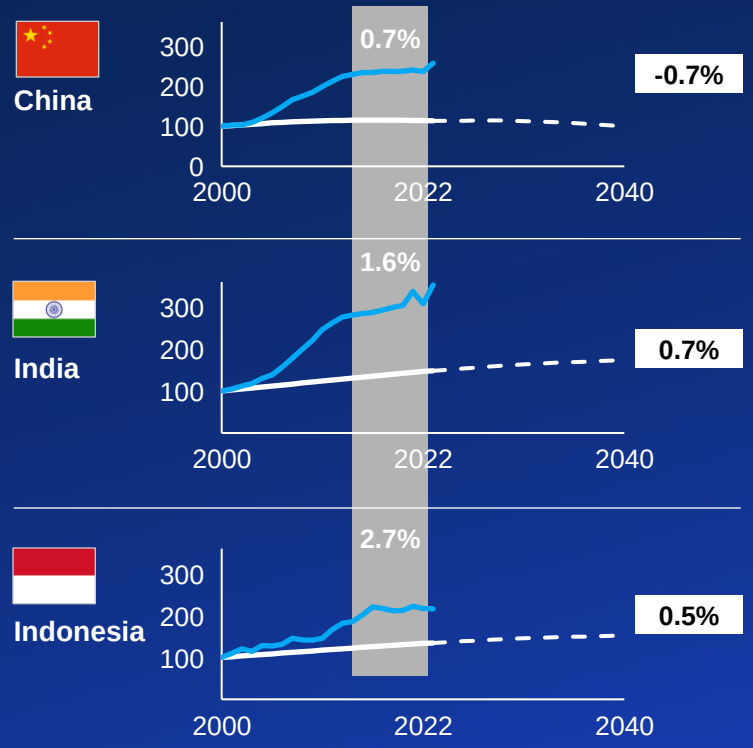


.. developing economies have seen significant construction labor growth



1. Workforce projection based on United Nations 80% upper bound scenario, 15-64 age;
2. Assumption that construction workforce follows same trend as total workforce projection

Source: McKinsey Capital Excellence Practice analysis using sources from World Bank, United Nations, ILO

On current trajectory, the sector may be unable to meet demand pertaining to growth, infrastructure, net zero, housing

Cumulative construction output, 2023-2040 ($tr, real 2019, excluding China)

~$40 trillion

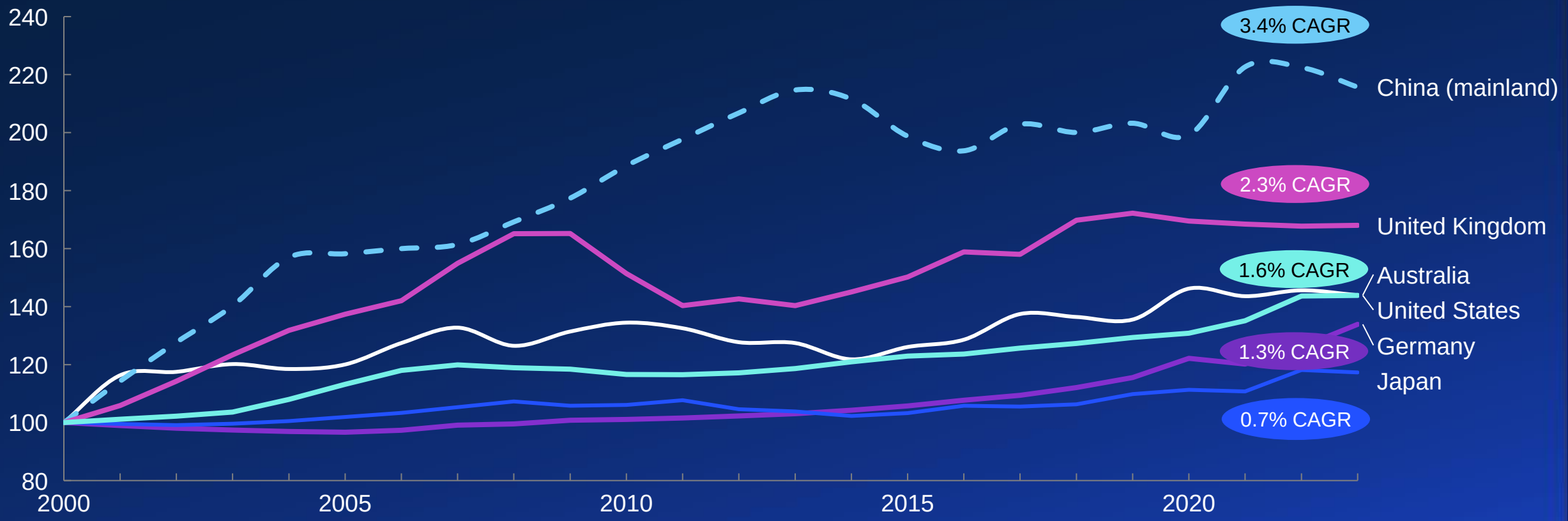
shortfall in construction output by 2040 assuming continued productivity stagnation and sector employment in line with overall workforce growth

1. IHS Markit estimates net of estimated net-zero spend to be redirected from existing construction projections based on McKinsey Global Institute forecast (see footnote 2),
2. McKinsey Global Institute net-zero estimates, assuming 25% net-zero capex directed to construction (and not to machinery and other physical assets), conversion rate from sales to VA for net-zero projected from IHS Markit estimates for construction
3. Projections assuming current output indexed to workforce trends and unchanging productivity, workforce trends based on World Bank projections for population aged 15-64. Estimate calculated according to 10 largest economies in terms of construction (~69% of global output) and generalized across global economy

Source: McKinsey Capital Excellence Practice analysis using sources from IHS Markit, World Bank, United Nations, ILO

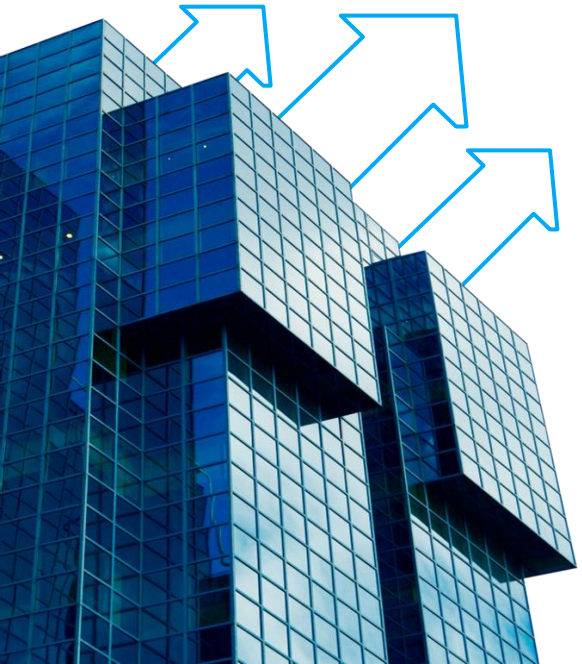
Will a long-run trend of construction price escalation beyond general inflation accelerate?

Construction output prices relative to consumer price inflation; Index 2000 = 100



Source: IHS Markit

It feels like we have made progress – why haven't contruction productivity numbers improved?

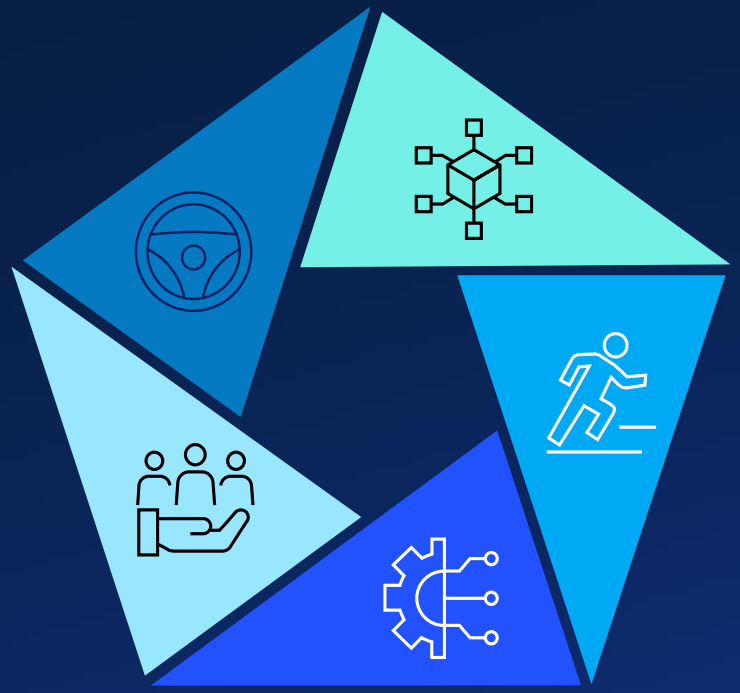


- Technology uptake has been slow and mainly **focused on control rather than productivity**
- The industry **struggles to scale improvements** from one project to the entire portfolio
- The industry has passed on **results of productivity improvements**
- Tender dynamics and low margins **limit investments in productivity efforts**
- Projects have become more complex, exposing **construction companies to more risks**
- Labor market tightness and **workforce churn** have affected skill levels
- **Timely delivery** takes priority over productivity improvements

What will it take to improve productivity?

Steer construction like production
by combining milestone tracking with measuring production rates for critical path activities to enhance steering

Invest in skills
through technology-supported learning, apprenticeships, and project academies



Apply technology
that improves productivity through design to construction

Build long-term supplier relationships
to enhance learning, team stability, and workflow efficiency, **led by owners**

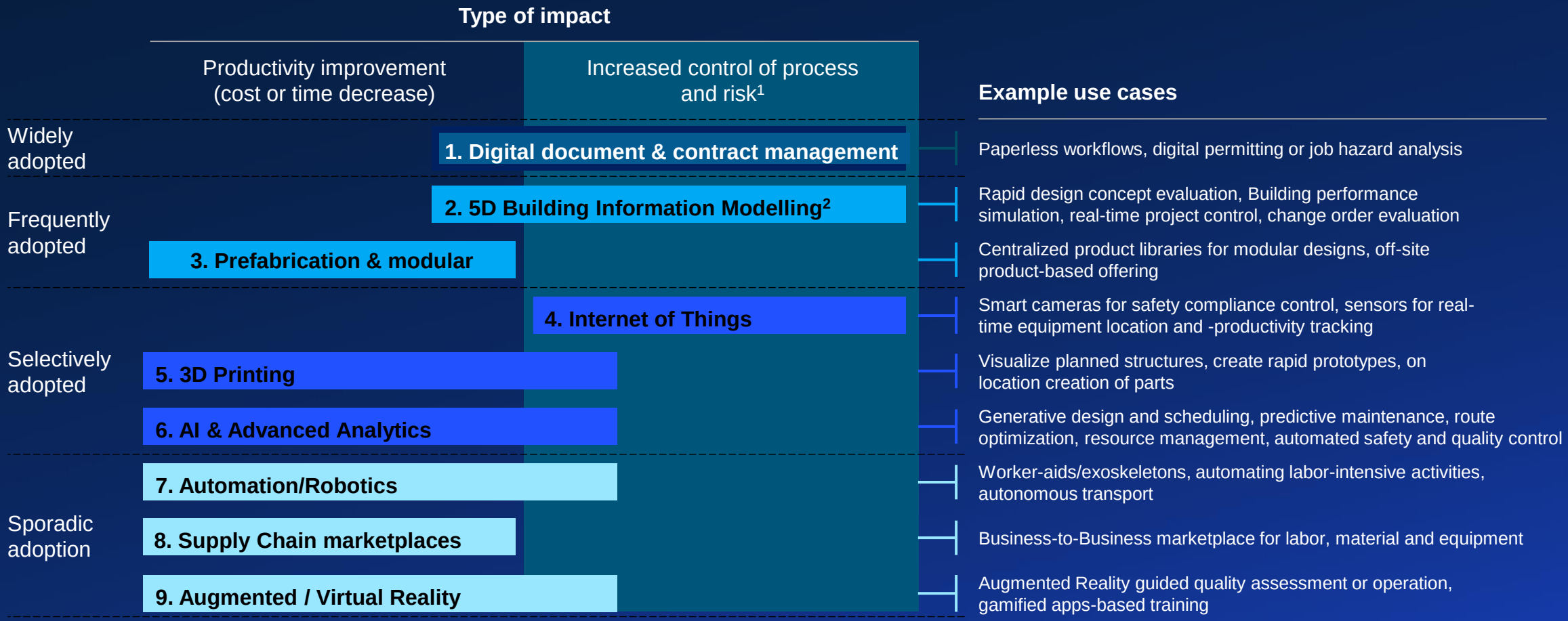
Scale improvement
across project portfolios with tailored change management and diverse capabilities

Source: McKinsey Capital Excellence Practice

Backup

Innovations have often not been adopted at scale or focused on control more than productivity

9 mature innovations in the Construction sector (non-exhaustive)



1. Includes control, monitoring, measurement, modeling, safety assurance
2. BIM is widely used in major firms for the design and construction phases, "true" end to end usage still not applied broadly

Source: From start-up to scale-up: Accelerating growth in construction technology, McKinsey, 2023; Rise of the platform era: The next chapter in construction technology, McKinsey, 2020; McKinsey Analysis; Expert interview