

TODAY

Tomorrow & Beyond

LEVERAGING LEADERSHIP, DIVERSITY AND INNOVATION



ECC Association

Next generation capital operating system

Next generation capital operating system

Forum agenda

00:00 Introductions (10 min)

00:10 Next generation capital operating system:
increasing productivity and profitability (15 min)

00:25 Facilitated panel discussion (35 min)

01:00 Audience Q&A (10 min)

01:10

Our moderator and panelists



Filipe Barbosa
Sr. Partner,
McKinsey & Company



Manuel Junco
Group Vice President
Jacobs



Matt Parsons
Senior Expert
McKinsey & Company



Judd Kuehn
Project Manager Ret.
Chevron



Mike Tecza
Sr. Expert,
McKinsey & Company

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Executive Summary

Context

- Construction sector **productivity has flat-lined or even declined** in most advanced economies for decades
- The reasons for weak **productivity development are broadly understood** (yet not measured), but change is slow at best

Challenges that need to be overcome

- Skills and fragmentation
- Limited adoption of new technology and methods
- Poor owner/contractor alignment
- Uniqueness of projects, standardization and geographical dispersion

Emerging opportunities

- Identify and assess pockets of excellence (e.g. how can these be applied elsewhere)
- Identify disruptive technologies and assess their impact

Forum will leverage McKinsey Global Institute report scheduled for publication around time of conference

Objectives of current construction productivity research



Investigate a wide range of **contributors to lagging productivity** in the construction sector by **identifying pockets of excellence** (country, sector, company) using macro-, segment, and firm-level data and building real-world improvement case examples

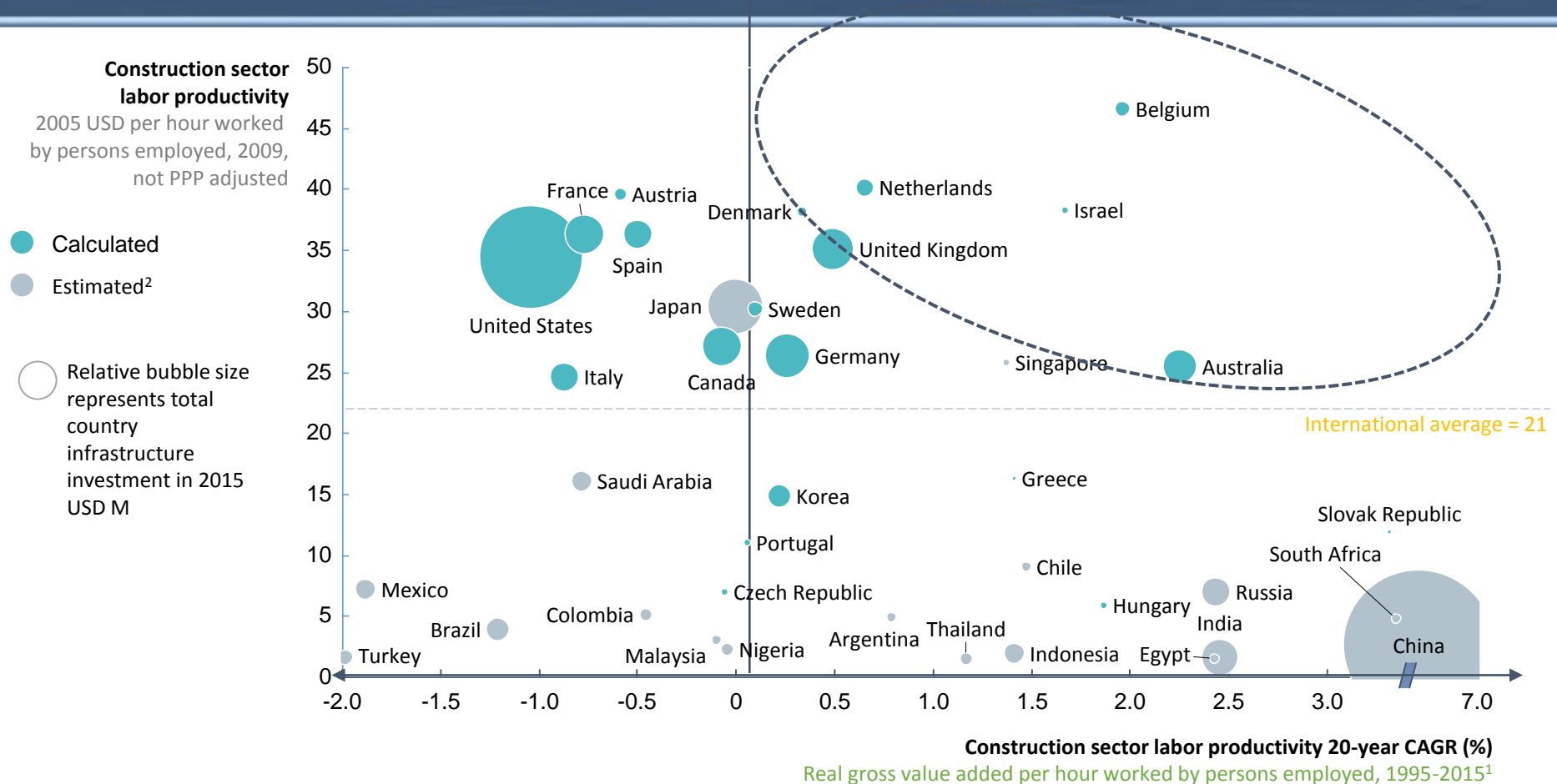


Identify innovations and disruptive technologies and assess their value at stake, changes in the industry structure (including value chain, ops improvements, organizational barriers/opportunities), and structure barriers to adoption through surveys, detailed case studies and value at stake analysis



Inform **recommendations** for private and public sector parties

Globally, construction productivity has lagged other sectors – however the picture is quite different across geographies

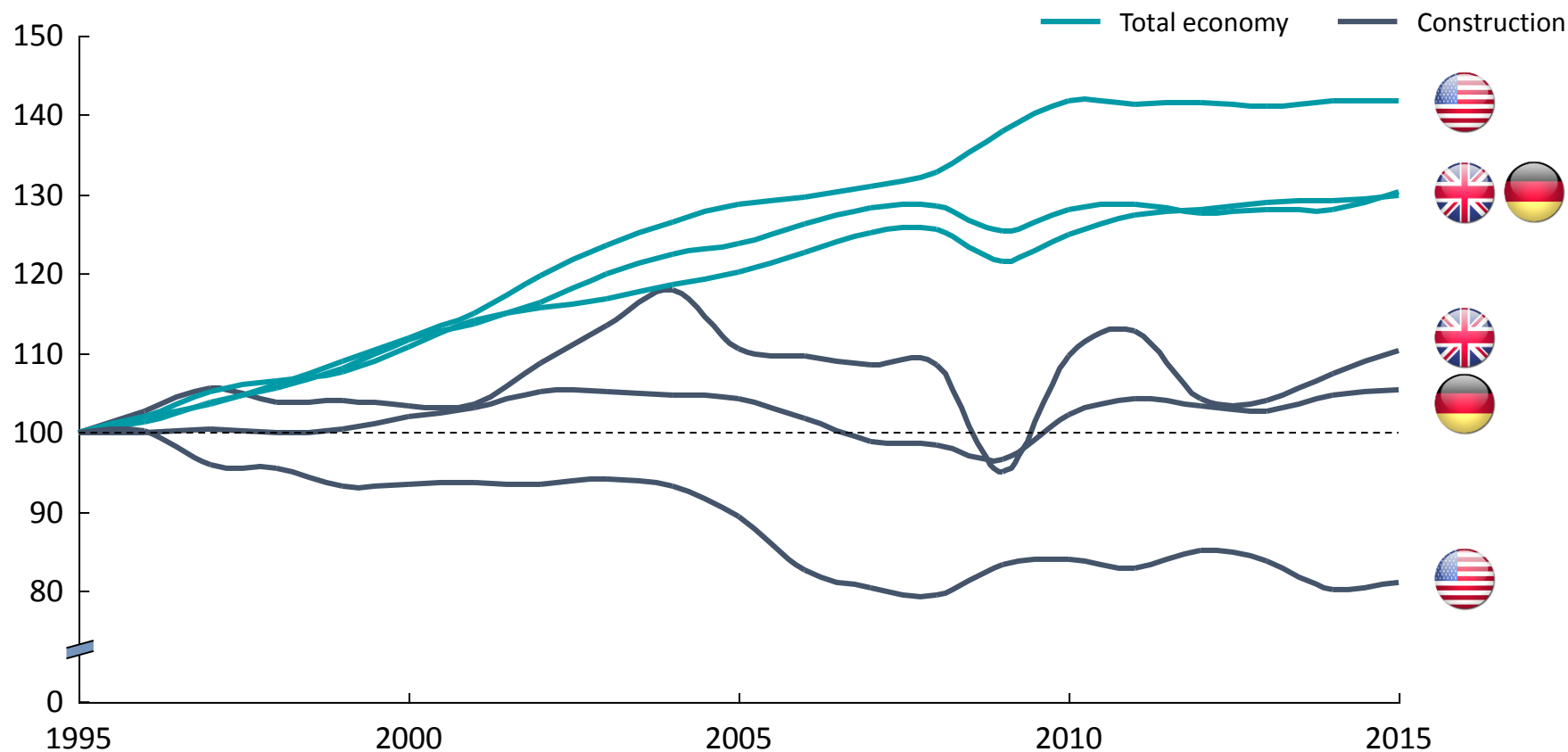


1 Countries with a shorter times series due to data availability: France, Israel, Czech Republic, Malaysia, Russia (1995-2014), Australia, Japan, Argentina, Brazil, Chile, Mexico, South Africa, Nigeria, Ethiopia (1995-2011), Belgium (1995-2014), Turkey (2005-2015), Colombia (1995-2010), Egypt (1995-2012), China (1999-2014), Thailand (2001-2015), Singapore (2001-2014), Saudi Arabia (1999-2015), Indonesia (2000-2014)

2 Only "persons employed" data available – assumed each person worked 35 hours per week, 48 weeks per year

In particular, the U.S. has experienced negative productivity growth off of a high base

Labor productivity (gross value added per hour worked, constant prices¹) Index 100:1995

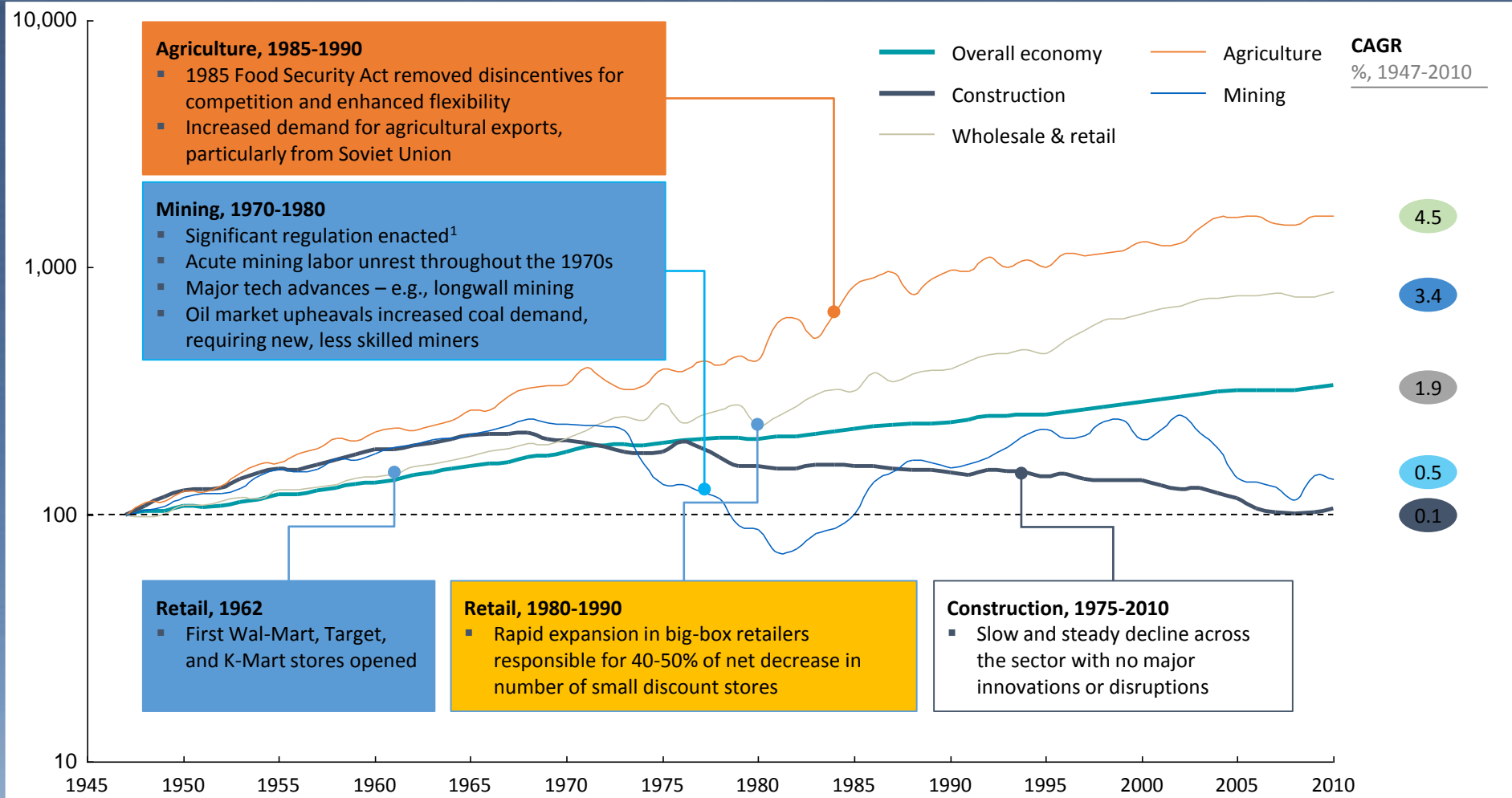


Note: Significant variance of construction productivity depending on choice of source data and deflator, but overall clear trend

SOURCE: ECD STAT – Productivity and ULC by Main Economic Activity (ISIC Rev. 4); US Bureau of Economic Analysis - Value added by industry & Chain-Type Price Indexes for Value Added by Industry, US Bureau of Labor Statistics – Hours and Employment Data, Division of Industry Productivity Studies

What happened in 1965?

Gross value added per hour worked, constant prices
Log scale; Index 1947 = 100



¹ Coal Mine Health and Safety Act of 1969, Clean Air Act of 1970, Surface Mine Control and Reclamation Act of 1977

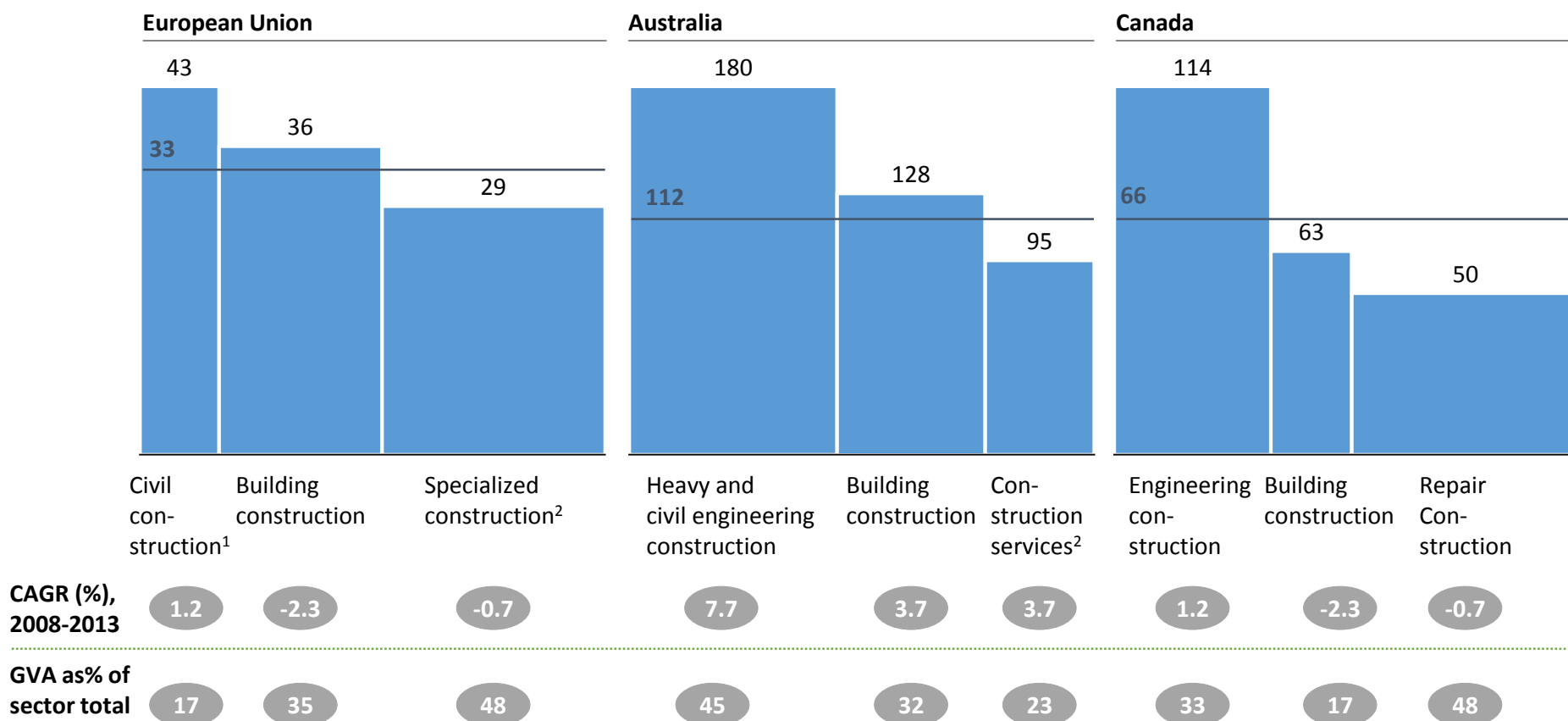
Is part of the story explained at the sector level?

Construction sub-sector labor productivity

Average gross value added per person employed 2008-2013, current prices, thousands of national currency

Construction sector average

x



1 Includes motorways, streets, bridges, tunnels, railways, airfields, harbors, irrigation and sewer systems, industrial facilities, pipelines and electric lines

2 Includes construction trades common to different structures – demolition and site preparation, electrical, plumbing, HVAC, plastering, joinery installation, painting and glazing, floor and wall covering, etc.

What can E&C firms do?



Invest in technical and vocational training programs



Build a development program for project managers



Standardize systems and practices



Create a detailed performance-management system



Articulate a clear set of values and targets



Make project-delivery teams more accountable



Create an integrated data system



Leverage technology effectively

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Panel questions

- What needs to happen in the industry to capitalize on emerging innovations? Is the industry ready for change?
- Where are the innovations needed – people models, training, operating systems, industry structure and contracting relationships, technology?
- Which emerging technologies and pockets of excellence are most appealing to your organization and why?
- Can innovation help bend the historical E&C productivity trend? What would it take?

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Session Participant Bios



Filipe Barbosa

Director, Houston, North America



Core sectors

- Mining
- Steel
- Oil & Gas
- Aluminum
- FMCG

Core topics

- Project Value Optimization
- Capital organization design
- Capital strategy
- Small Capex/Portfolio optimization
- Construction

Pre McKinsey Experience

- Filipe was a lecturer in the School of Mechanical Engineering, University of the Witwatersrand, South Africa

Education

- PhD in Aeronautical Engineering from the University of the Witwatersrand, South Africa

General profile

Filipe's expertise is in the strategy and capital productivity areas. Filipe has served leading Petroleum, Mining, Metals, FMCG, Power & Logistics clients in the capital space (mega project optimisation, capital organisation design and capital strategy and portfolio optimisation)

Example of recent projects

- Serving a large Petroleum and Chemicals company on a 2 year capital productivity transformation (mega project optimisation, capex organisation design and capital portfolio optimisation).
- Serving one of the world's largest mining houses on multiple engagements on capital productivity (optimisation of major greenfield and brownfield mines; capital procurement & design of capital organisation and processes), capital commodity strategy including: global pricing; M&A reviews; integrated energy perspectives and downstream strategies
- Optimising the business and investment case for a major bauxite and alumina project for one of the world's leading Aluminium companies
- Designing capital delivery and optimisation organisation & processes, optimising major brownfield mine expansion and optimising capital procurement at one of the world's leading gold mining companies
- Optimising a major open-pit greenfield iron-ore mine: including customer back value in use (VIU) product optimisation and pit shell, mine plan and mining methodology optimisation
- Conducted major capital project optimisation (CSCR) and designed global capital productivity organisation and processes for a leading global FMCG/brewing company
- Conducted large scale CSCR & optimised total capital portfolio (>200 capital projects) at a leading Steel company
- Serving a large utility on procurement, capital purchasing and clean sheet capital redesign
- Has led multiple strategic and cost reviews for major multinationals in the steel, petroleum and insurance sectors.
- Served a large Petroleum multinational on multiple engagements covering both their top-down strategy for Africa and confidential M&A work

Manuel Junco

Group Vice President Jacobs



Manuel Junco serves as Senior Vice President and General Manager for Refining and Americas of Jacobs Engineering Group Inc. (NYSE: JEC), a technical, professional construction services company. The firm was founded in 1947.

Mr. Junco has 40 years of experience in the oil, gas and chemical industries. He started his career in maintenance and operations at Monsanto Chemicals before joining the EPC industry as a process engineer, progressively moving to field engineer, engineering manager, project director and global operations. He joined Jacobs in 2012 as Vice President – Houston Operations.

As Senior Vice President, Mr. Junco has overall business responsibility for our EPC delivery offices located in the U.S., Canada, and Latin America. These offices service the hydrocarbon business sector.

He holds a degree in Mechanical Engineering from the Georgia Institute of Technology.

Matt Parsons

Partner



- MBA, University of Pennsylvania's Wharton School, Palmer Scholar
- Control Systems Engineer from United States Naval Academy
- Matt is a Partner in McKinsey's Philadelphia Office who leads the Americas Capital Productivity and Infrastructure Practices
- Matt has extensive experience in the Global Energy and Materials Sector, including Electric Power and Natural Gas, Oil and Gas, Chemicals, and Basic Materials

Broader Practice Leadership

- Leader and convener of the Americas Capital Productivity and Infrastructure Practices
- Formerly led and convened McKinsey's Nuclear Power Service Line

Capital Productivity experience

- Has support project recoveries with multiple owners, operators, and EPC firms on distressed large projects ranging in investment level from \$300M to \$20B
- Led a comprehensive capital projects and engineering transformation for a leading global chemicals manufacturer, who spends \$2B a year in capital across a range of projects and business units
- Supporting the development and implementation of a corrective action plan related to the major cost and schedule overrun of a reactor plant new build – the TVA WBN2 project
- Developed a contracting strategy for a European JV seeking to develop a technologically-complex, major offshore natural gas deposit
- Supported the precommissioning, commissioning and ramp-up planning for a \$10B iron ore mine in South America
- Coordinated the systematic de-risking of two multi-billion dollar materials mines in remote geographies confronted with substantial cost and schedule overruns or development challenges
- Conducted due diligence on several EPC firms and guiding the award process and follow-on terms and conditions negotiation for the EPC contract for a \$6B project
- Led confirmatory due diligence for a major Energy and Oil & Gas acquisition in the EPC space
- Helped devise a go to market, development, and execution strategy for an engineering services firm in the nuclear power space
- Led a regulatory risk improvement effort related to utility sector investment in carbon capture and sequestration technologies for fossil generation plants, including technological, commodity, and infrastructure risk assessment

Prior Experience

- Spent ten years in the Nuclear Navy, where he held various responsibilities related to the construction, operations, and maintenance of nuclear powered submarines, including three years forward deployed in Guam as the plant manager of a 165MW reactor plant on USS San Francisco
- Spent two years in the Pentagon on the Chief of Naval Operations Staff in the Planning, Programming, and Budgeting office where he coordinated \$13B of annual capital investment in naval shipbuilding

Jose Luis Blanco

Associate Partner



- **MBA, Stanford** Graduate School of Business
- **MSc / BSc** in Civil Engineering in **Civil Engineering** from Barcelona Tech (UPC)
- Jose is an **Associate Partner in the Philadelphia Office** and helps lead the Engineering & Construction service line in the Infrastructure Practice. He is also an active member of the Electric Power and Natural Gas Practice / Capital Productivity service line
- Jose has **extensive experience in the Engineering & Construction** sector, where he worked for almost 10 years

Broader Practice Leadership

- Leadership of the Engineering & Construction service line for the Infrastructure Practice

Projects Experience

- Supported one of the largest E&C firms in Latam improve their Project Delivery, with specific focus on lean construction and Design to Value in their Engineering function
- Led a **benchmarking effort for ~40 leading E&C firms worldwide**, analyzing their financial and operating metrics (including procurement), as well as their strategic positioning
- Conducted an **infrastructure project operational assessment** for a \$20Bn Conglomerate. Defined impact areas and applied different levers to improve operational efficiency leading to 5% direct and 7% potential savings, mostly from procurement levers
- Supported one of the **largest federal agencies** on a **complete assessment** of their **Capital Program** (Capital allocation, design & construction, leasing & maintenance processes)
- Developed a **capex investment prioritization procedure** for a **leading European utility** leading to a €1Bn cash cost optimization. Conducted large scale project scrubbing sessions that led to improved IRRs and reduced CapEx.
- Led a **confirmatory Due Diligence** for two of the leading E&C firms worldwide with strong footprint in Power and Oil & Gas, studying in detail their global portfolio, risks, footprint and the potential opportunities for them going forward, which included a complete assessment of their procurement function.
- Supported a 2Bn **Merger Integration in the E&C space**, with strong focus on devising and implementing procurement levers for a complement transformation of the procurement function (~50% of overall synergies)
- Supported **diverse PE firms in multiple DDs** in the E&C space over the last two years, including detailed diagnostic of their procurement functions.

Prior Experience

- Prior to McKinsey, Jose Luis worked with Grupo ACS as a **Senior Project Manager** in the **E&C Division** (Dragados)
- As a Senior PM, planned, budgeted and led the execution of multi-million dollar singular projects with full P&L responsibility, including designing, modeling and executing a turnaround in a \$150m project resulting in \$18m EBIT improvement. Responsible for Direct procurement of over ~\$80M, directly negotiating and closing key contracts, leveraging DtV, minimal technical solutions and commercial levers

Mike Tecza

Senior Advisor, Houston, North America



Core sectors

- Oil & Gas construction / development
- Power
- Rail
- Highway
- Mining

Core topics

- Project controls

Pre McKinsey Experience

- **Shaw Group** – Director of Program & Construction Management
- **Bechtel** – Manager of Program Scheduling

Education

- Mechanical Engineering degree from Triangle Institute of Technology in Pennsylvania

General profile

Michael is a McKinsey Advisor in Capital Productivity practice. Michael has over two decades of Program and Construction Management experience both foreign and domestic. During his tenure with Bechtel, he held various leadership positions on foreign assignments in Power, Rail, Highway Infrastructure and Oil and Gas construction / development projects. He has an extensive background in project controls. He ensures all projects under his leadership have the correct program management control tools implemented

Example of recent projects

- He completed an assignment with the Shaw Group as the Georgia Transportation Investment Act (TIA), Program Director. He organized and led the proposal effort during the past year and won the \$1.4b, ten year contract in December of 2012. The winning team that he established and led consisted of (IBM) for Program Data Integration and Pricewaterhouse Coopers (PwC) for Financial Controls along with seven other highly specialized infrastructure firms in Atlanta.
- As a Director of Program & Construction Management for the Shaw Group, Michael actively participated and held leadership positions in the following sectors:
 - Emergency Management sector (Sandy Recovery (NYC Rapid Repairs Program).
 - Mining sector: EPCM Integration Manager advising (Freeport McMoRan \$1.7b mine expansions) both foreign and domestic.
 - Waste Water sector: EPCM integration responsibilities for the construction of (NYCDEP \$1.3b Newtown Creek) secondary treatment facility.
 - Environmental Restoration sector: BP-Deep Water Horizon Oil Spill: (Program Director for the construction of \$260m oil containment berms).
 - Infrastructure sector: Director of Project Controls / Business Manager: (\$1.3b Inner Harbor Navigation Canal (IHNC). The largest design build contract ever awarded by the USACE.

John Levene, P.E.

Engagement Manager



- John Levene is an Engagement Manager in the Philadelphia Office of McKinsey and Company where he is a member of the Capital Productivity Practice
- Mr. Levene has experience working on large capital programs and engineering & construction corporate strategy in oil & gas, chemicals, utilities and infrastructure with both public and private entities
- He has functional expertise in contracting strategy, portfolio management / optimization, risk mitigation and pricing, fabrication and modularization, constrained labor market management, capital program acceleration

Projects Experience

- Developed contractual risk assessment, pricing, and mitigation plans for a \$60B nuclear power facility refurbishment and PPA
- Helped a major utility develop an efficient capital project portfolio execution and contracting strategy in a constrained, unionized labor market across \$1B+ of annual spend
- Led a collaborative effort to revamp a major utility's capital project execution infrastructure drastically reducing change order volumes and contract leakage while optimizing project overheads
- Assisted regulated utility with development of multi-tiered energy efficiency credit program, implementation plan and contracting strategy
- Optimised drill rig manufacturing, staffing and placement for a major oil field driller during both market upturn and recent downturn (accelerated and pared back program)
- Helped streamline delivery of \$3.5B in government aid to natural disaster victims
- Led the development of a five year growth strategy for a major US E&C firm
- Developed 5 year growth strategy for a \$1B+/year scaffold, insulation and paint company across both commercial and industrial US segments

Prior Experience

- Prior to joining McKinsey, Mr. Levene acted as Interim Program Director for a \$750 million LEAN scaffolding program along the U.S. Gulf Coast and as the Global Lead for Construction Commercial and Market Strategy at Fluor (FLR).
- While at Fluor, Mr. Levene focused on optimizing execution and commercial success of Fluor's U.S. Gulf Coast construction portfolio. Additionally, he developed and launched multiple standalone construction business entities; scaffolding, commissioning & turnover, orbital welding, and onsite concrete production. He also worked extensively to reduce Fluor's global labor market risk via global fabrication and modularization strategy development, driving innovation in procurement and execution.
- Prior to these roles, Mr. Levene was in the Global Estimating and Controls Group of Fluor's Energy and Chemicals business unit. Prior to Fluor, Mr. Levene worked at Moretrench American Corporation leading industrial and high-end geotechnical projects in roles ranging from foreman / superintendent to project engineering and manager.

Appendix: Previous sessions Feedback

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SOURCE: Source

Feedback from 2015 ECC Forums

"Great opportunity for me to network with key customers (EPC's, Contractors & Users) to discuss current and prevalent topics. Opportunity to hear about current concerns and challenges facing the EPC and User community. Opportunity to hear and learn about outside forces that impact large North American project"

"Thought provoking and inspired me to challenge the standard model for executing capital projects"

"Some of these topics could have been extremely valuable had they been set up slightly differently. Instead of a mediator and panel, perhaps have a seasoned speaker that is an expert in the field of your choosing and then have industry executives weigh in their thoughts on certain key points. The information presented was very good, but some of the panelist lost the interest of the audience unless someone stepped in to get the attention back. An effective presenter is key for the short timeframes allowed to keep them moving and interesting"

"Optimized Owner Contractor Risk Sharing - I enjoyed that Q&A was intertwined throughout the session, rather than only at the end"

"There needs to be more meat in these presentations. They were too soft and too general"

"The "xxx" break out session was not that great. It was more less a series of questions that the audience would give their take on the questions. I didn't learn anything that I already knew on this topic."

"The risk assessment workshop was too much confusing information in too short a period, not value at all. The risk sharing session was repetitive of past sessions, nothing new. Executive Leadership had some new interesting takes"