

Driving Capital Projects to Best-in-Class Execution

Energy Construction Forum
March 2015



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Outline

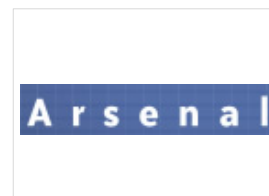
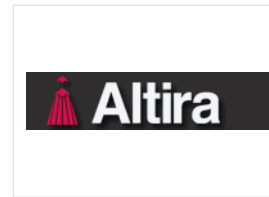
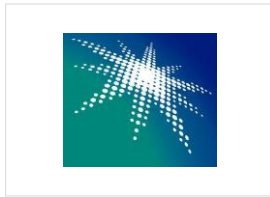
- ▶ **About ADI Analytics**

- ▶ Driving Capital Projects to Best-in-Class Execution

ADI Analytics is a boutique consulting firm serving energy and chemical companies with passion, rigor, and expertise

	Markets	Technology	Operations	Functions
Oil & Gas	 Exploration	 Production	 Refining	 Distribution
Power & Mining	 Coal	 Generation	 Transmission	 Carbon
Renewables & Cleantech	 Biomass	 Solar	 Wind	 Geothermal
Chemical & Industrial	 Plastics	 Materials	 Auto	 Manufacturing

Fortune 500 and mid-sized companies, start-ups, investors, and governments have hired us to shape decisions globally



Outline

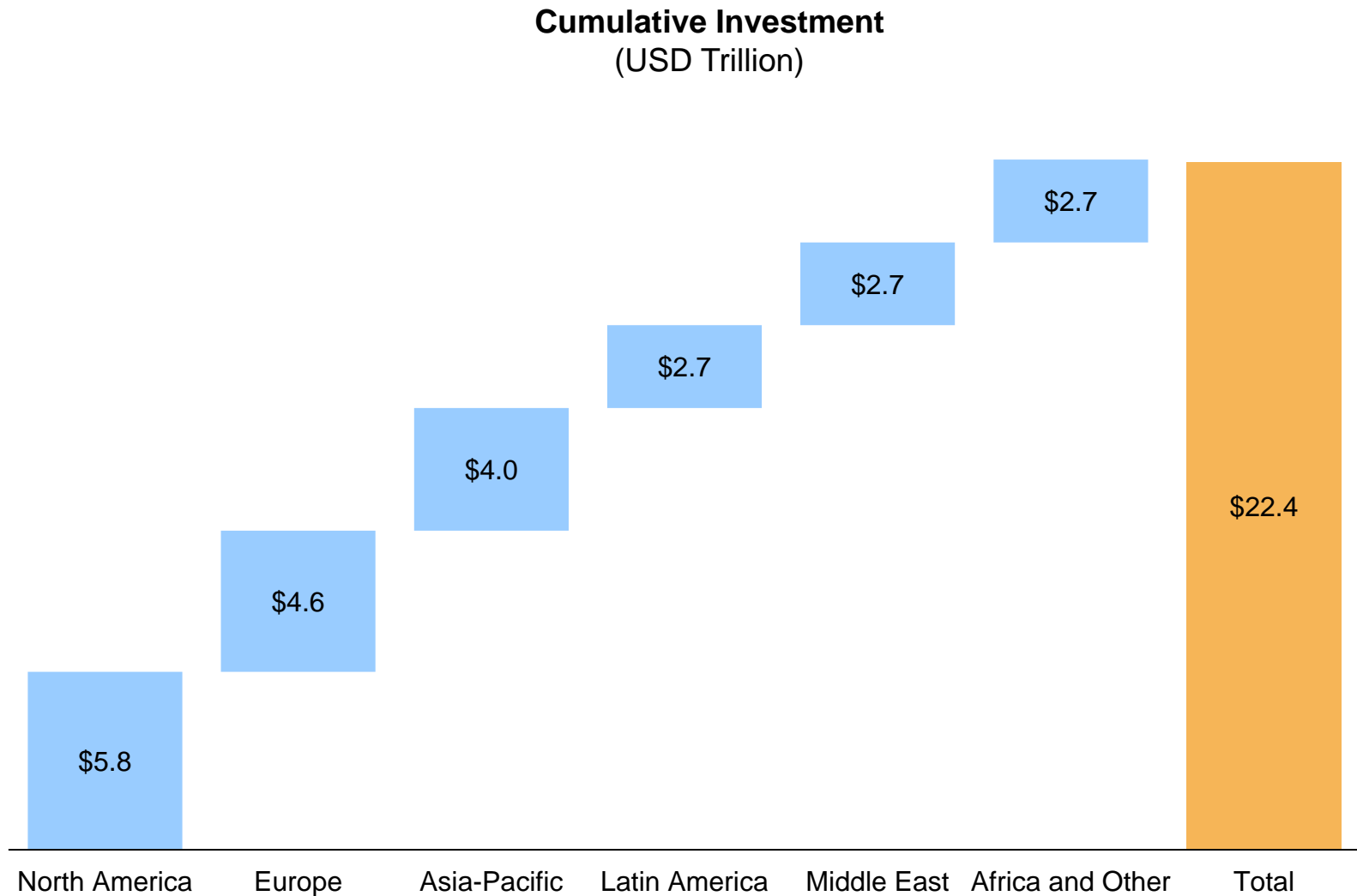
▶ About ADI Analytics

▶ **Driving Capital Projects to Best-in-Class Execution**

Key messages

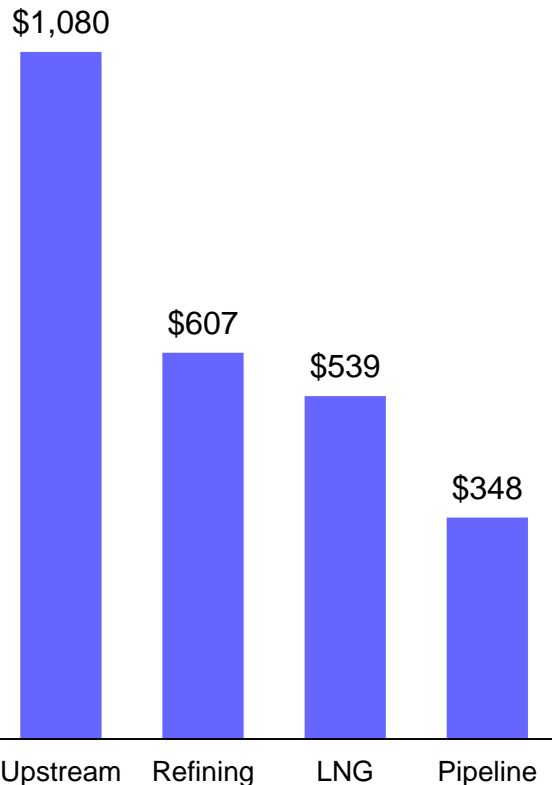
- 1 Improving project execution is critical given the oil and gas industry's scale of investment in capital projects and prior history with cost and schedule issues.

Global investment in oil and gas projects over the next two decades is anticipated to be in the trillions of dollars

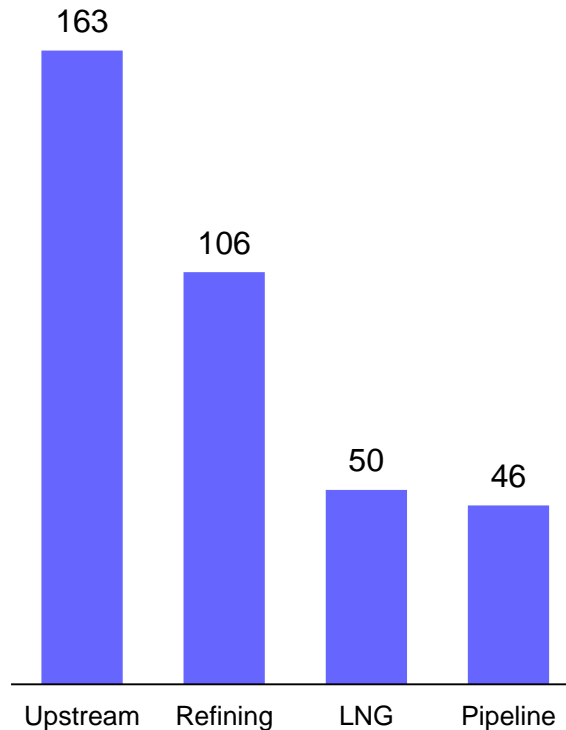


Upstream dominates capital investment but spend is not insignificant across other oil and gas value chain segments

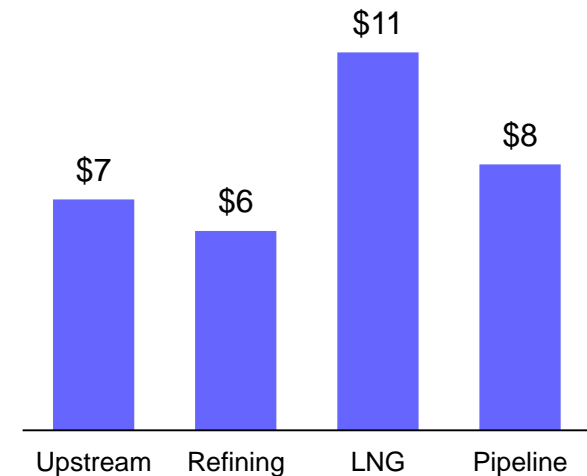
Total Investment
(USD Billion)



Number of Projects

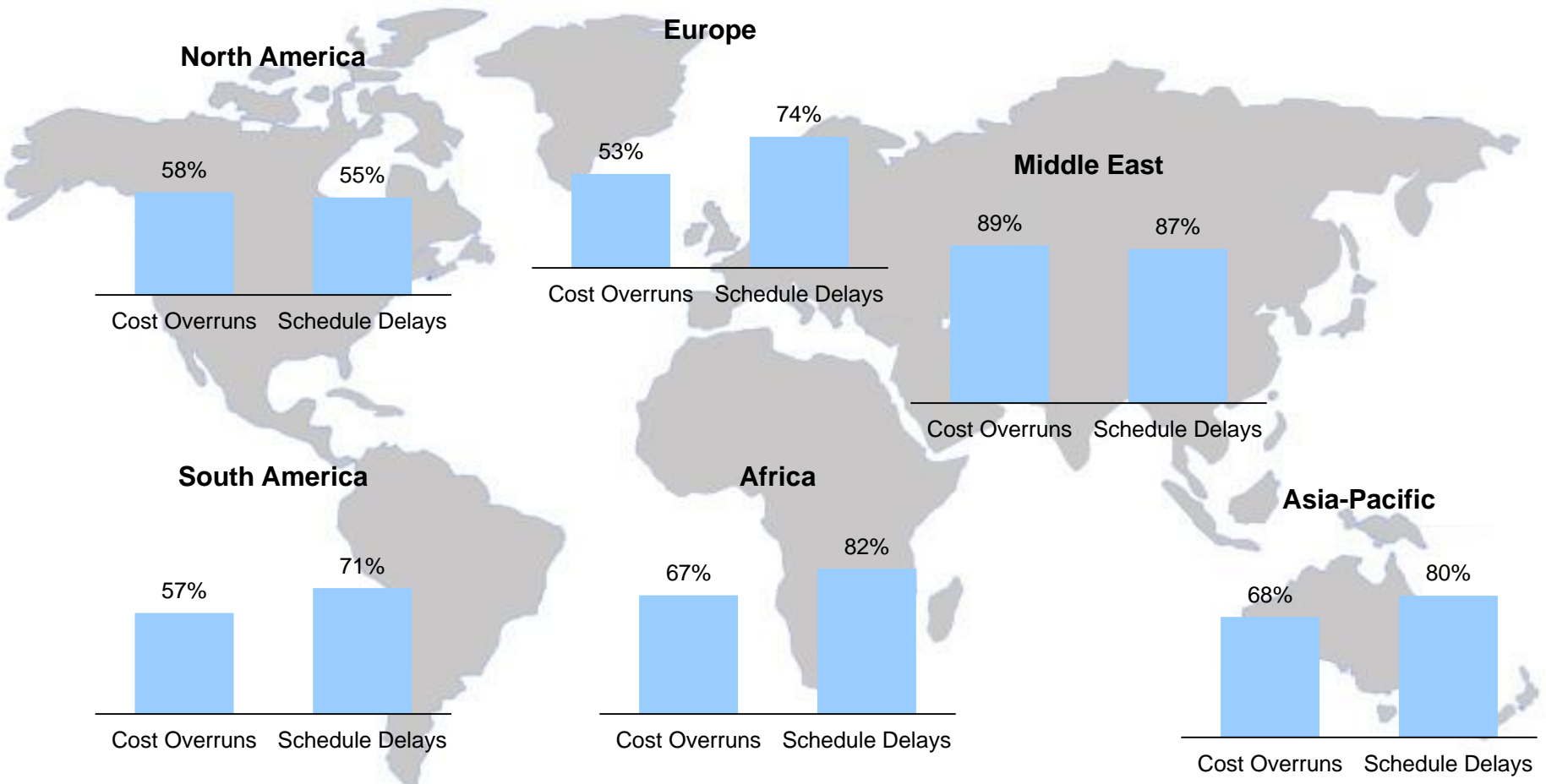


Average Project Size
(USD Billion)



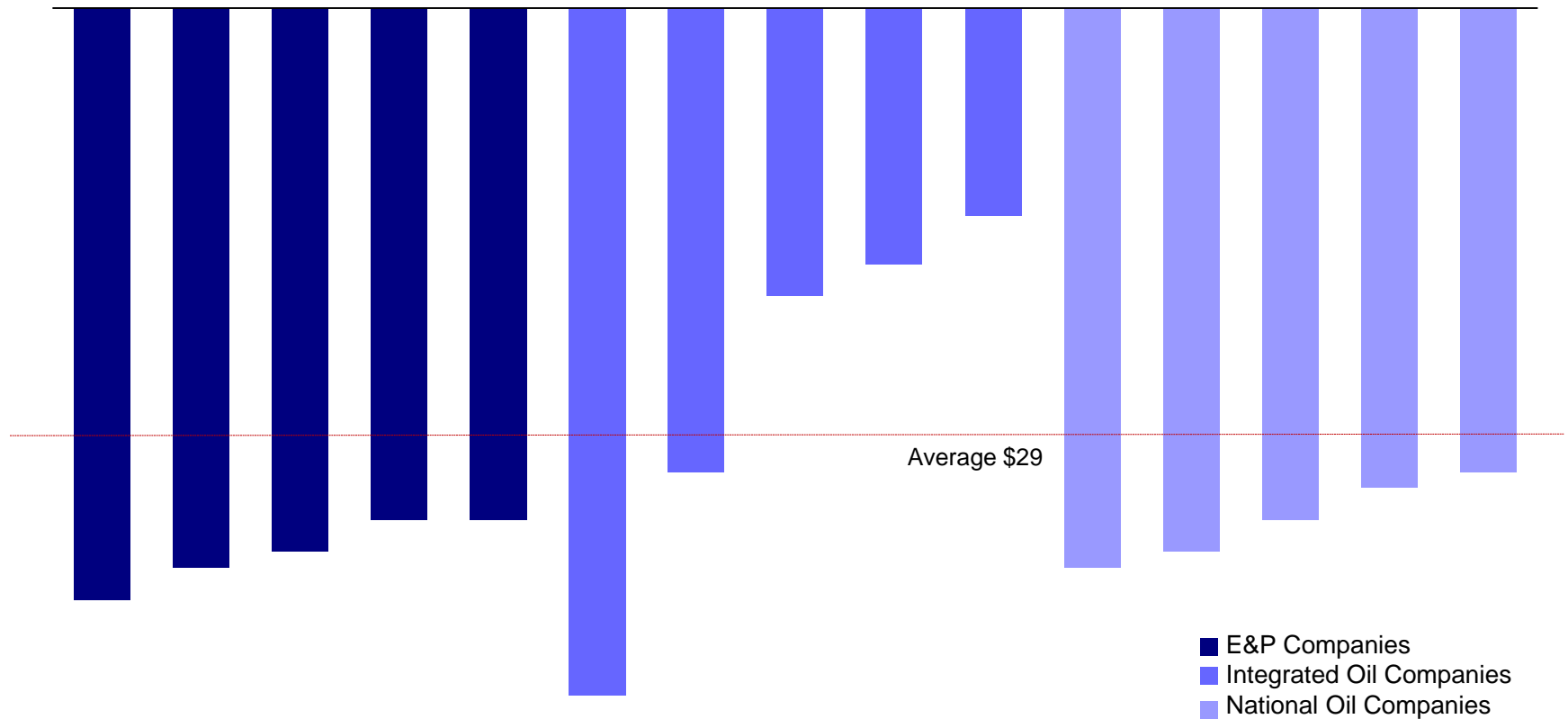
A significant share of this spend will face cost and schedule issues based on historical data and across the globe

Project Delays by Region
(Percentage of Projects)



Delays can have significant impact on returns given commodity cycles as seen by the current slate of projects

Difference in Oil Price Between FID and First Oil
(USD Per Barrel)

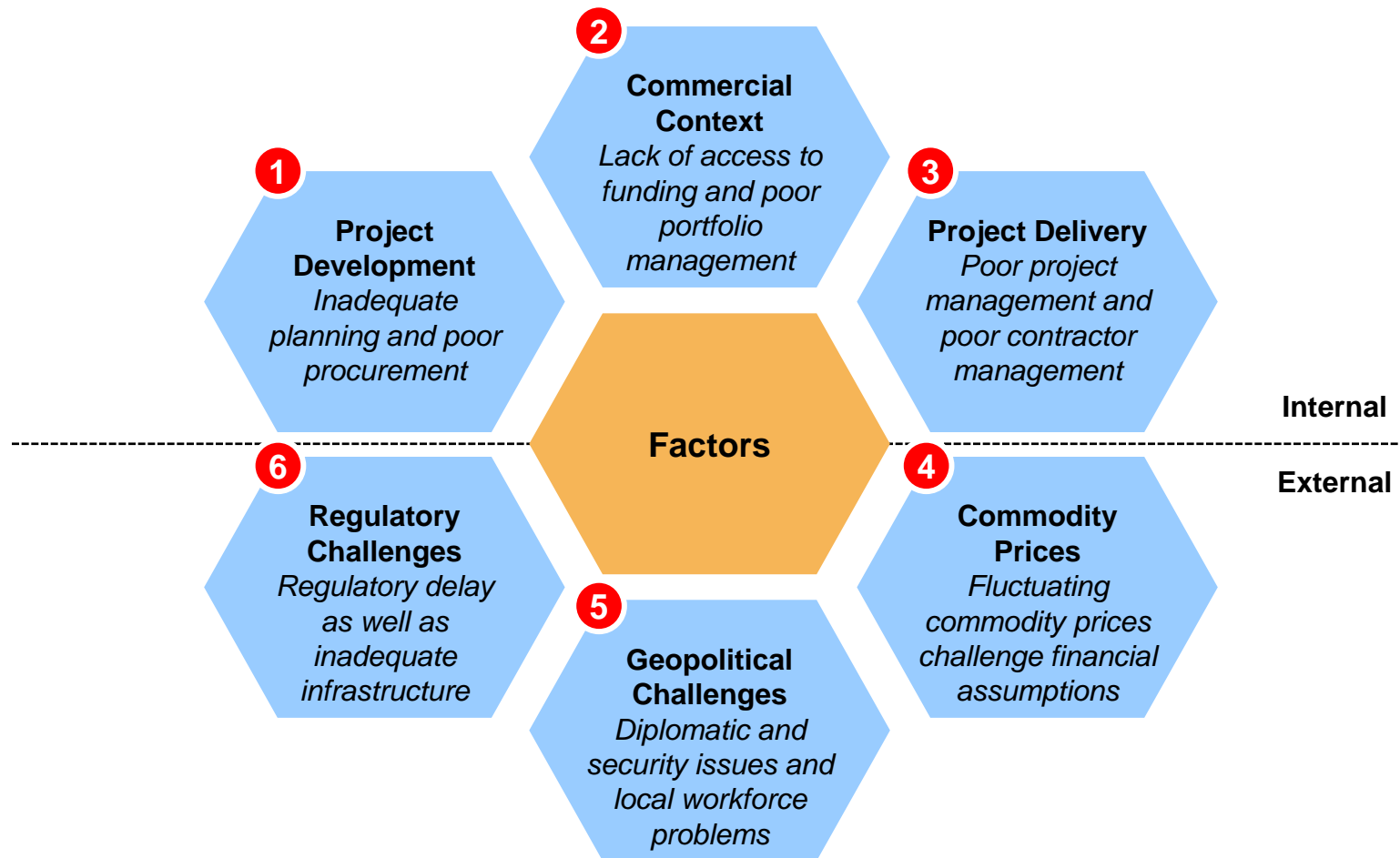


Key messages

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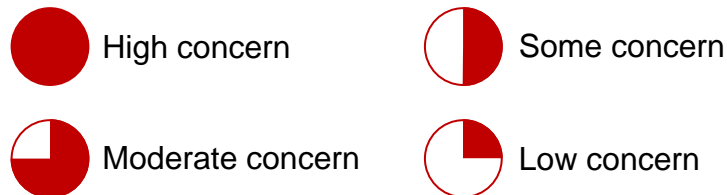
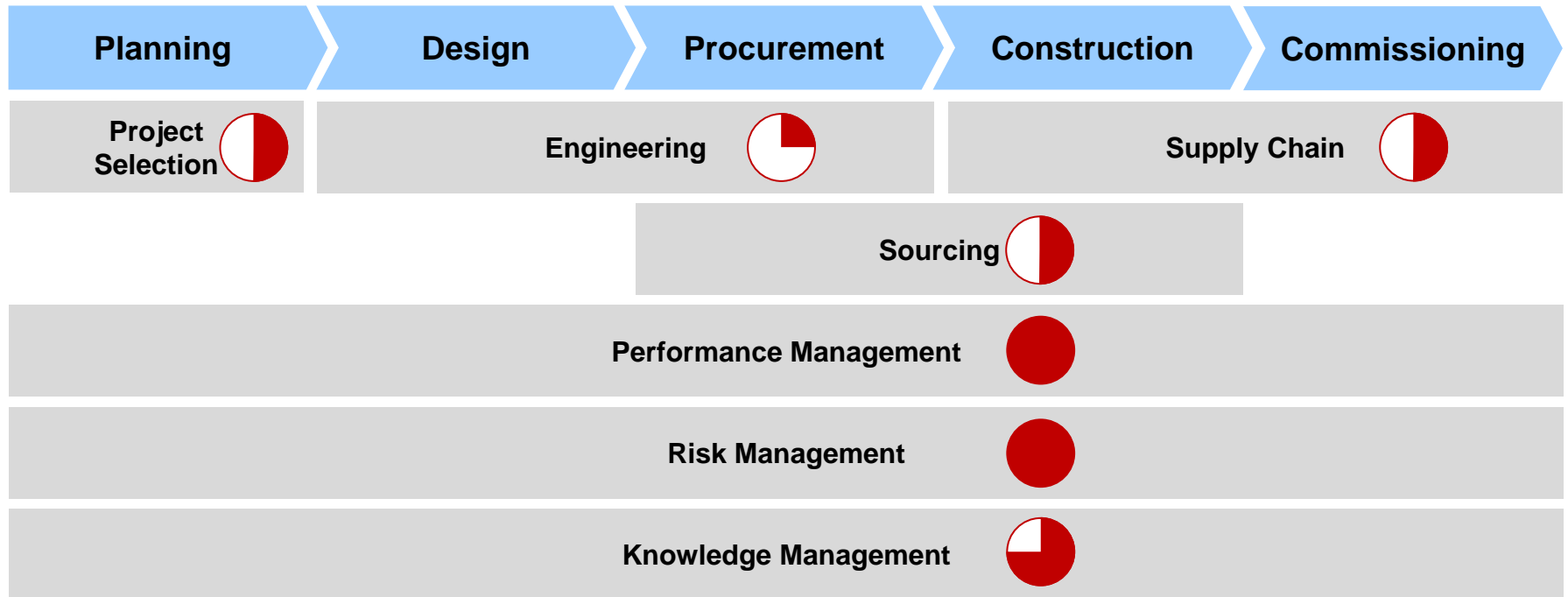
2 Various internal and external factors impact capital projects with issues and concerns across the execution value chain.

Several factors -- both internal and external -- affect cost overruns and schedule delays in large capital projects



Capital projects suffer cost and schedule overruns due to issues and concerns across the execution value chain

Capital Project Execution Value Chain and Operator Concerns by Segment



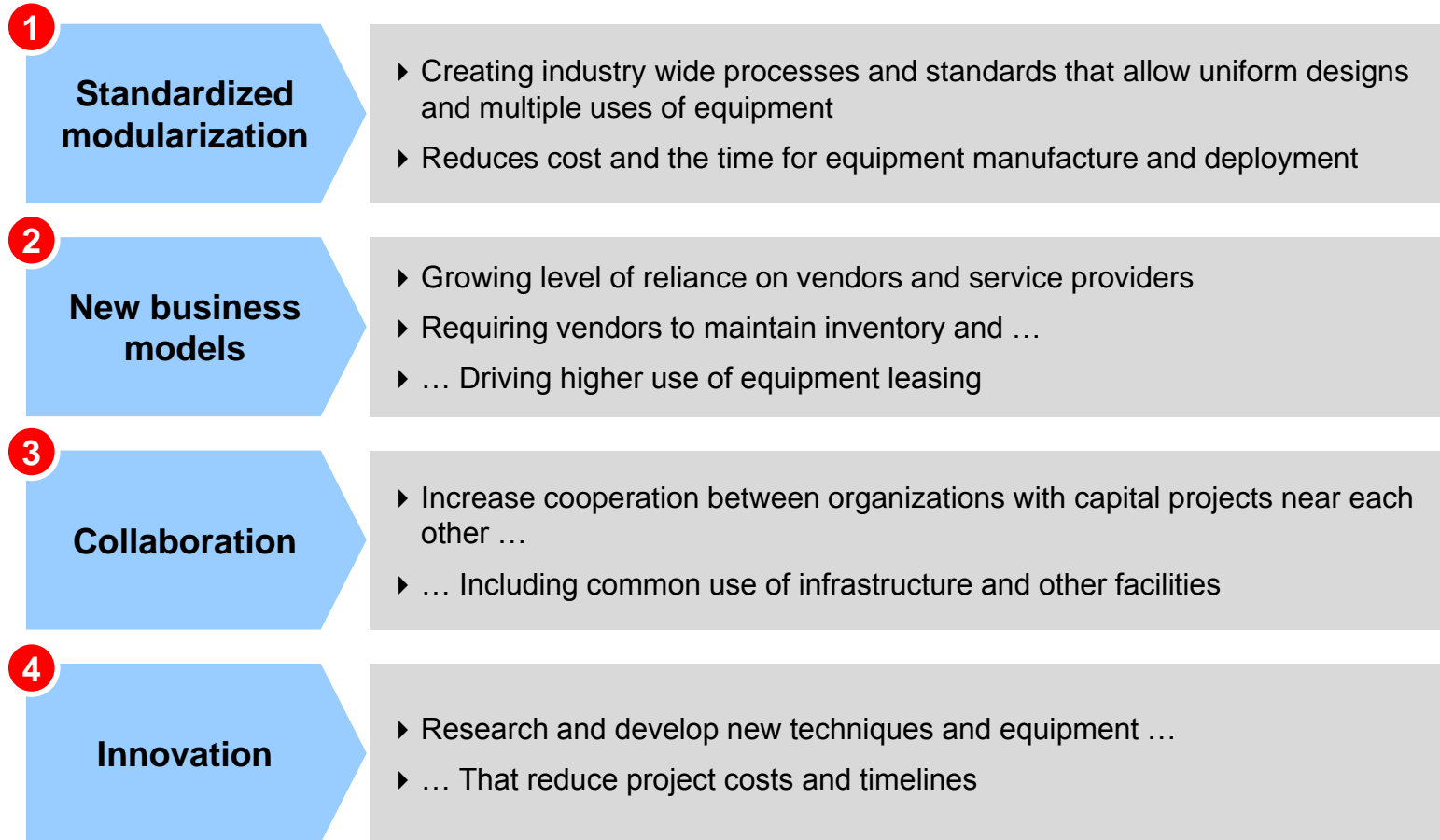
Key messages

1 Improving project execution is critical given the oil and gas industry's scale of investment in capital projects and prior history with cost and schedule issues.

2 Various internal and external factors impact capital projects with issues and concerns across the execution value chain.

3 Oil and gas operators can cut risks of cost and schedule overruns and, in fact, accelerate projects through the use of four key levers.

Oil and gas operators can cut cost and schedule risks and, in fact, accelerate projects through the use of four key levers



1

Standardization and modularization can enable scale and cost reduction allowing operators to focus on critical issues

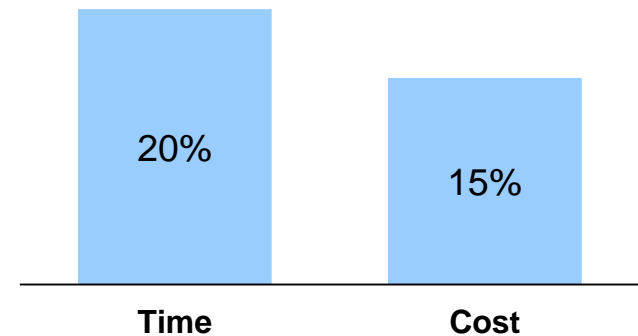
Key Benefits

- ▶ Use common standards and equipment
- ▶ Increase understanding of failure modes
- ▶ Stop reinventing the wheel and focus on critical problems
- ▶ Build knowledge base on equipment and its applicability in various situations

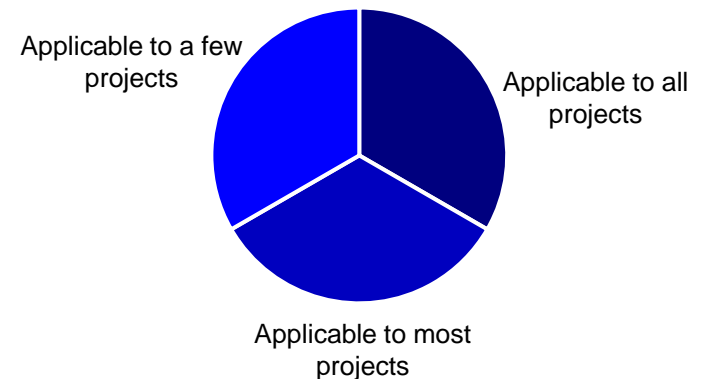
Examples

- ▶ NGL processing plants
- ▶ Oil and gas production facilities
- ▶ Compressor trains in LNG plants
- ▶ Helicopter pads on landing platforms
- ▶ Flare gas recovery units in refineries
- ▶ Oil and gas production modules on FPSOs

Potential Time Impact



Potential Applications



New business models such as leveraging suppliers' inventory and growing equipment leasing can accelerate projects

Growing use of inventory

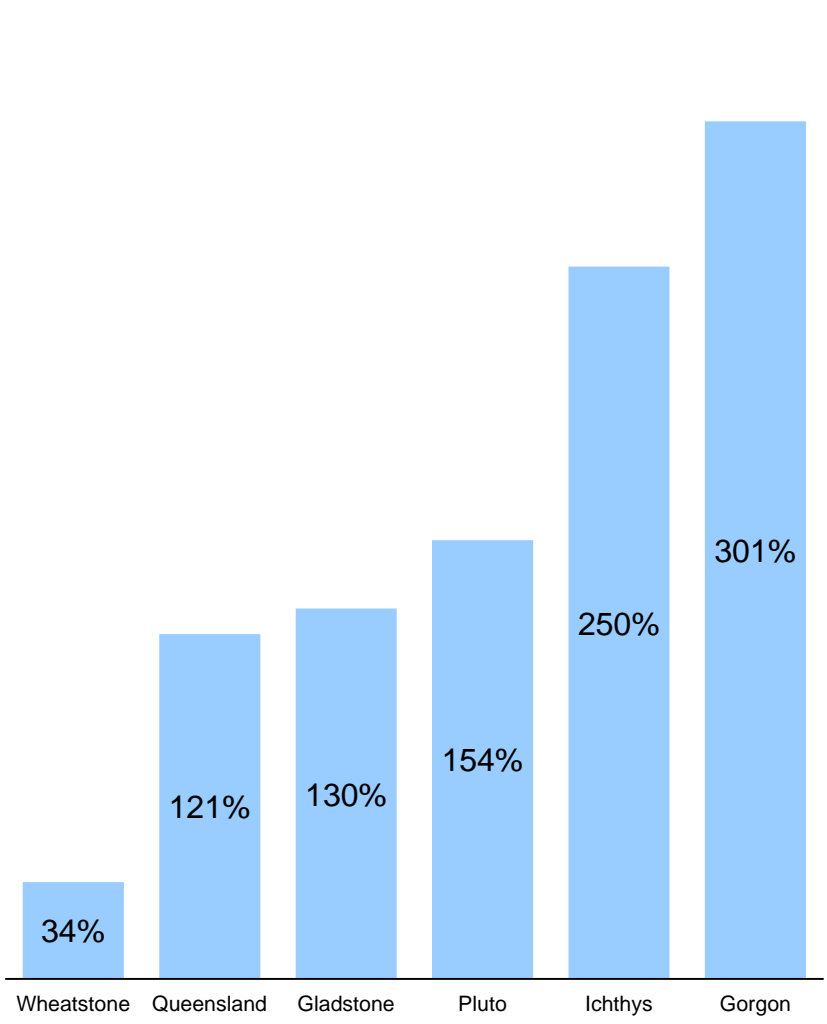
- Operators are worried that production facility delays and costs, when aggregated, could impact pace and economics of their unconventional assets
- Near-term responses have included bulk sourcing, inventory maintenance, and other supplier and supply chain management strategies
- Case study: Leading Oil & Gas Major
 - Increasingly using standard production equipment and a central office to track assets across all shale plays ...
 - ... Initially in the U.S. and later overseas
 - Modeled on LEGO's building blocks

Increasing level of equipment leasing

- Most production equipment is currently purchased and owned by operators
- However, a few select systems, e.g., wellhead compressors and some amine units, are leased by operators
- Several factors are critical in pushing operators to lease equipment
 - Equipment complexity
 - Ability to respond to varying wellhead production volumes and composition
 - High capital costs and operating resource needs / skills
 - Need for high reliability and uptime

Collaboration can lead to better management of capital projects in certain regions, e.g., LNG projects in Australia

Australian LNG Project Cost Increases



Key Examples

Develop joint standards

- ▶ Collaborate to qualify suppliers and standardize contracts to cut time
- ▶ Develop standard specifications of common, non-critical equipment
- ▶ Collaborate on common policies, e.g., for health, safety, and environment

Aggregate and smoothen demand

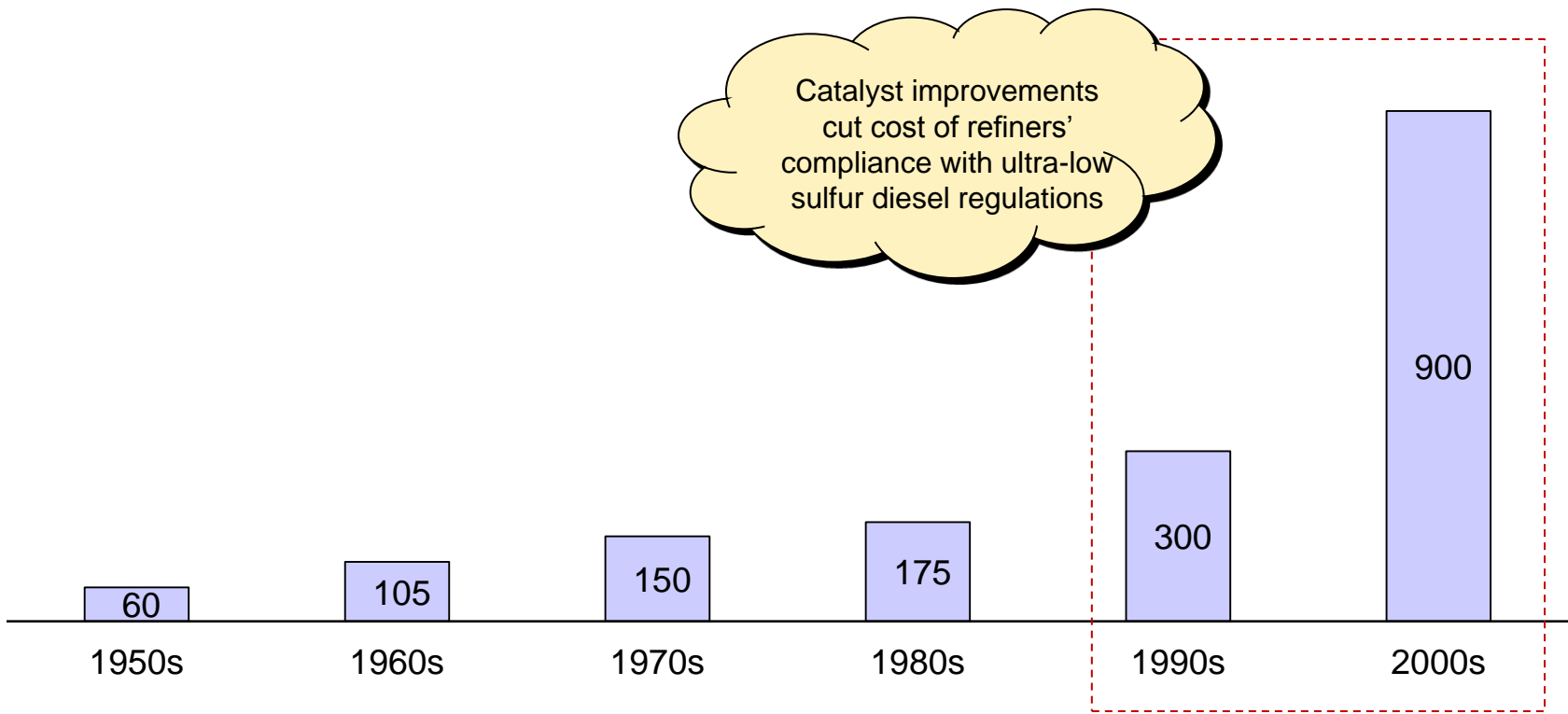
- ▶ Pace the timing of the construction schedule ...
- ▶ ... Lower equipment, deployment, and commissioning costs and ...
- ▶ ... Consider aggregating demand

Share infrastructure

- ▶ Leverage brownfield sites
- ▶ Develop common infrastructure, e.g., ports, together

Finally, innovation can help with cost and schedule issues albeit on a longer time scale and over multiple projects

Hydrotreating Catalyst Activity (Relative Volume Basis)



Key messages

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3 Oil and gas operators can cut risks of cost and schedule overruns and, in fact, accelerate projects through the use of four key levers.



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