Riding the Wave
CAPITALIZING ON THE VELOCITY OF CHANGE

44TH ANNUAL ECC CONFERENCE
Overview

• Global Megatrends – the world is changing

• Projects will be impacted…and look different

• More complexity, new risks

• Implications and success factors
Global marketplace is transforming

**Globalization**
- Demographics
- Technology
- Natural resources
- Regulation & activism

**Impact on energy**
- New types of fuels
- New geographies
- Resource nationalism
- Competition for resources

**The new consumer**

Source: A.T. Kearney
Capital projects are changing

Spending is increasing – for example E&P

Forecasted CAGR: 9.8%

Increased complexity increases risk profiles

- Complexity:
  - Technical
  - Size
  - Ownership
  - Regulatory

- Risk:
  - Feedstock
  - Execution
  - Market

Risks vary along the value chain

Source: A.T. Kearney research
Stakeholders have varying views on risks – example E&P

- Difference in capabilities and objectives drive differences in risk tolerance - drive potential conflicting decision (e.g. selection of suppliers, permitting delays, asset strategy)
- Difference in priorities can jeopardize the project success and expected returns

Source: A.T. Kearney research
Project execution is lacking – the impact is significant

- **Schedule**: % of project behind schedule
  - 0-10%: 44%
  - 11-20%: 19%
  - >20%: 12%

- **Budget**: % of project over budget
  - 0-10%: 49%
  - 11-20%: 14%
  - >20%: 0%

% of projects behind schedule >10%, by project type:
- New construction: 57%
- Facility upgrade: 54%
- Facility maintenance: 39%

% of projects over budget >10%, by project type:
- New construction: 69%
- Facility upgrade: 64%
- Facility maintenance: 50%

On average at least ~23% of projects fail to meet the required return threshold

## Root causes are usually poorly understood

<table>
<thead>
<tr>
<th>Statement</th>
<th>Counterpart</th>
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<tbody>
<tr>
<td>&gt;95% of senior managers believe they <em>know what it takes to deliver capital projects successfully</em></td>
<td>... and yet 40% of projects are behind schedule</td>
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<tr>
<td>Nearly 70% of senior managers believe their organization <em>can accurately forecast resource requirements</em></td>
<td>... and yet over 71% of respondents indicate resource shortfall as a key concern</td>
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<td>Nearly 70% of senior managers believe their organization <em>pushes for standardization across the portfolio</em></td>
<td>... and yet only 29% use Standard Design as the predominant design approach</td>
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<td>60% of senior managers are confident that their organization can <em>manage budget deviations &amp; deliver projects on time</em></td>
<td>... and yet 61% of projects are over budget</td>
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<tr>
<td>On average, ~70% of senior managers are comfortable with their <em>risk identification/ assessment/ management process</em></td>
<td>... and yet only 19% of companies are rated in Stage 4 (Best in Class) in Risk Mgt.</td>
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<td>92% of senior managers believe their <em>capital strategy is aligned to business strategy</em></td>
<td>... and yet &gt;35% of companies indicate that this alignment is not ultimately adhered to</td>
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Source: A.T. Kearney research
The better practices are well known

A.T. Kearney’s House of Capital Excellence – Leading Trends

- Corporate strategy is driving capex spend for leaders
- Early involvement of procurement and suppliers for the entire portfolio of projects is a best practice
- Leaders are driving discipline in execution through rigorous design change process & performance tracking
- Project owners are pursuing methods beyond recruiting and employing formal knowledge management procedures
- Leaders are centralizing their project organizations with key project staff reporting to a central body
- Leaders involve operations and maintenance teams early in the project lifecycle
- Use of hedging and other instruments is increasing for Raw Material risk management
- Leaders customize returns threshold to reflect project specific risks and strategic context
- Leaders standardize in the base case and adopt a portfolio approach to project strategy
- Leaders use rigorous FEL to mature design and cost estimates and also identify unresolved issues

The differentiating trends

- Manage project portfolio to leverage commonality
- Manage emerging challenges
- Adopt advanced risk management approaches
Portfolio approach

Knowledge Management
- Improved cost estimation
- Lessons learned capture and dissemination
- Price benchmarking – labor and material
- Continuous improvement

Complexity Reduction
- Re-use of proven designs
- Common subsystems and components
- Prescriptive designs to contractors
- Design for lifecycle approaches

Supply Chain
- Commodity exposure reduction
- Longer-term contracts
- Volume leverage
- Tailored, risk-based contracting strategies

Resource Management
- Triage of engineering work – aligning top talent with most complex problems
- Reducing low value-add activities
- Leveraging ‘extended enterprise’ – outsourcing and/or offshoring
- Talent recruitment and development

Future View: Portfolio Capability
- Proactive development of resource strategies – labor and purchased materials
- End-to-end business focus to project acquisition, implementation and operation
- Continuous drive toward complexity reduction – engineering, maintenance

Source: A.T. Kearney research
Example – complexity reduction

Project Development Approach
(% of respondents who rate the following as the dominant approach)

- **Leaders**
  - Best in Class: 75%
  - Develop multiple scenarios: 25%
  - All Others Respondents (excluding leaders)
    - Project schedule: 21%
    - Maintenance cost: 17%
    - Overall project cost: 10%

% Savings achieved through leveraging Commonality across projects

- Project schedule: 20%
- Maintenance cost: 30%
- Overall project cost: 15%

Intangible benefits include “harmonization of suppliers” and “learning curve benefits”

Source: A.T. Kearney research
A new way of managing risks

- Cross functional risk teams – vs. siloed management of risk
- Supplier / contractors involvement and alignment – vs. arms length relationship
- Proactive JV partner alignment – vs. potential conflicting position
- Continuous risk management during project – vs. administrative exercise
Cross functional example: Technology introduction

**Traditional (sequential)**

- Only qualified technology used – often obsolete
- Conservative approach based on hand over from technology to project

**Advanced (parallel)**

- Technology and project work concurrently
- Risk managed by maintaining several options to accommodate future advances
Supplier integration example: A new approach to operational safety

- Look backs
- Standards and regulations
- Prescriptive guidance
- Compliance driven

- What if’s analysis
- Contingency planning
- Risk management

Project risks

Human space flights
Armed forces
Others

Emphasis on team’s behavior at the front line

- Clear collaboration mechanism
  - Alignment of incentives
  - Decision structure clarified
  - Control limits are various scenarios
  - Drills to test team’s response
- Different behavior
  - Trusts in the team’s response
  - Robustness of the decision making process
Takeaways

• Project are becoming more complex and risky

• Impact of poor execution is increasing

• Portfolio approach and risk management = key differentiators

• Leveraging commonality and managing risk collaboratively improve asset performance over the long term
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