Forum Safran 2022

Megatrends that influence execution of megaprojects

November 2022

pwc

Today's topics

- Introduction to PwC global and local capabilities
- Continued uncertainty - Introduction to megatrends from PwC surveys
- From global to local perspective
- Manage and prepare the organization for uncertain times
- The following five priorities should help deliver sustained outcomes in uncertainty
- Thank you and closing questions

PwC have megaproject teams in 70 countries who combine knowledge of local markets with deep sector expertise

Megaprojects & domain expertise is a community of complementary capabilities within our global firm network that helps clients finance, realise, operate, acquire, dispose and decommission essential infrastructure and major capital projects.

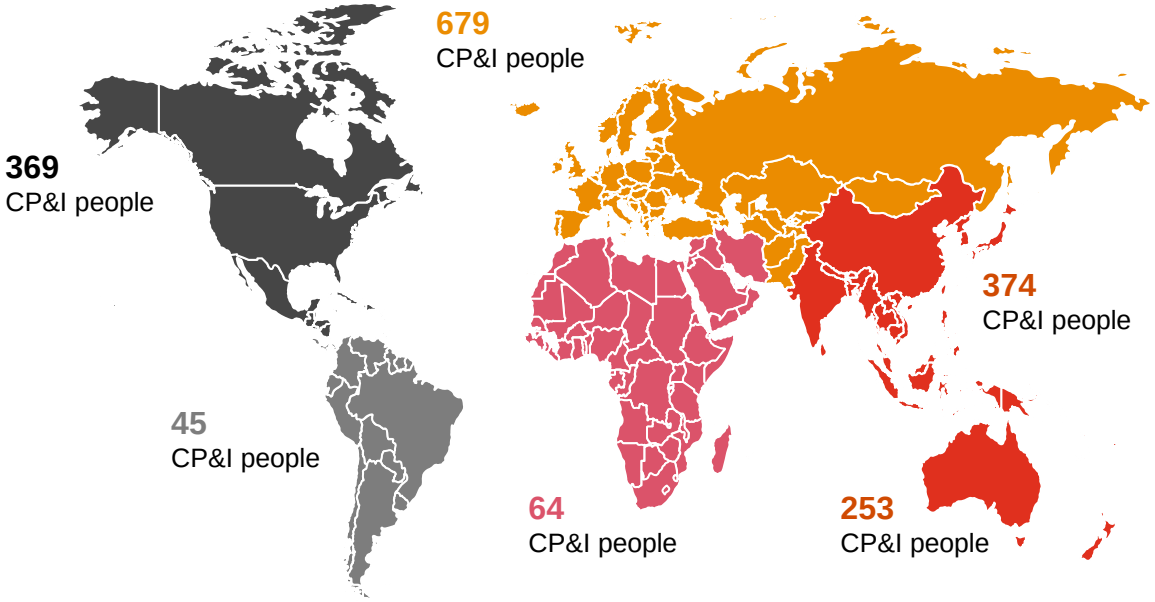
What connects all of these capabilities is the project lifecycle, which spans from strategy & planning through to the ultimate decommissioning. We also help clients who have multiple capital programmes or infrastructure assets to transform themselves.

Infrastructure investors generally operate internationally; and governments are committed to international development through International Finance Institutions – requiring infrastructure advisors to increasingly have global expertise and presence. PwC is well placed as our global network consists of more than 1,700 finance, engineering, technology, and sector expert professionals across the network:

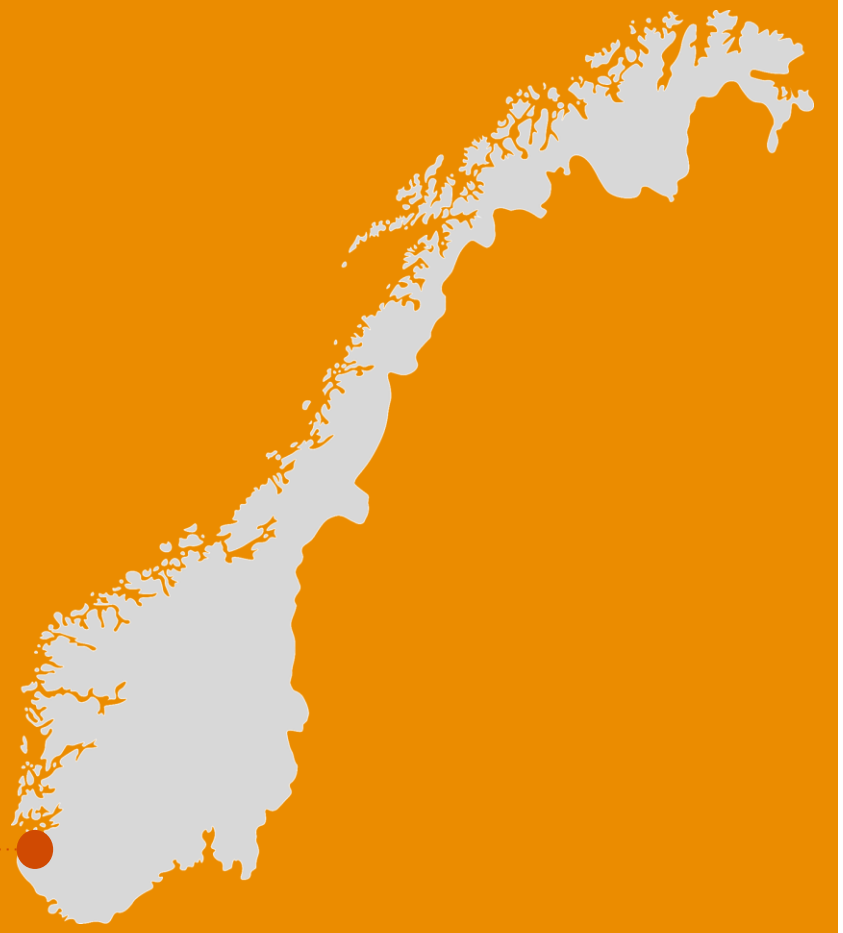
300
CP&I have advised on over 300 projects successful financed with limited or non-recourse funding

2,900
CP&I have advised on over 2,900 capital project & infrastructure projects over the last 10 years

Latin America
North and Central America
Europe
Asia-Pacific
Middle East and Africa



Local presence with strong references nationally and internationally



Stavanger is one of PwC's key Energy Centres globally

PwC Stavanger is central and is an important player for the EMEA region. Here we play an important role in projects for the O&G sector in Europe, the Middle East and Africa. This gives us a solid insight and experience and is a position we are very proud of.

We believe our industry expertise, combined with experience from other industries, will benefit our customers and enable us to support you in a very good way.

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OMV

КазМунайГаз

TOTAL

NEPTUNE ENERGY

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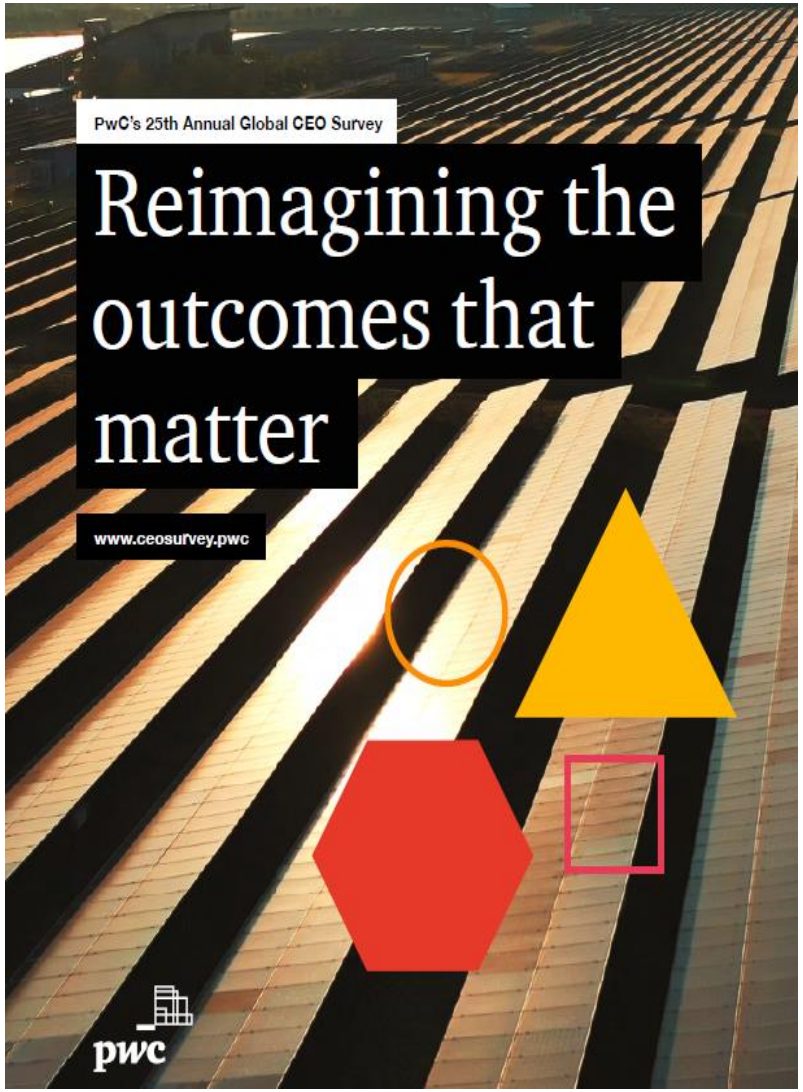
Manage and prepare the organization for uncertain times

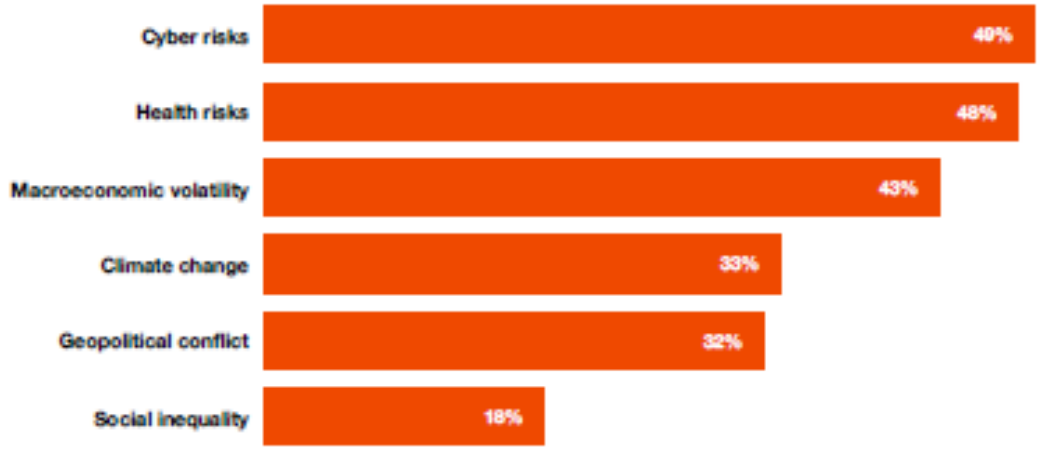
Preparing for uncertainty - Introduction to megatrends from the PwC 2022 CEO survey



CEOs rank cyber risks as the top threat to growth, with health risks close behind

Question: How concerned are you about the following global threats negatively impacting your company over the next 12 months?

(Showing only 'very concerned' and 'extremely concerned' responses)



Source: PwC 25th Annual Global CEO Survey

Is this survey relevant to companies operating in our region?

War-time and Macroeconomic Volatility

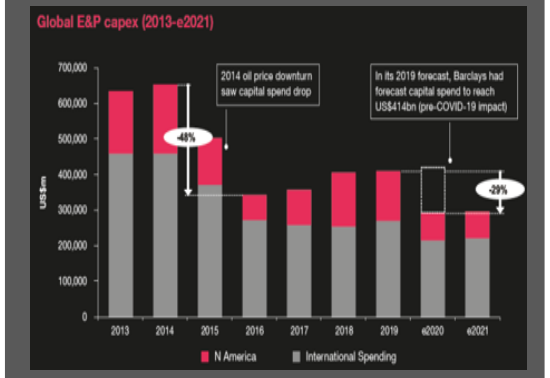
The worldwide supply chain continues to be significant affected by challenges relating to the COVID pandemic and war-time including increasing cost, delays and disruption. Many CEO's now identify supply chain turmoil as the greatest threat to their companies' growth and results

Here are five ways the supply chain has changed due to COVID-19 and ware-time

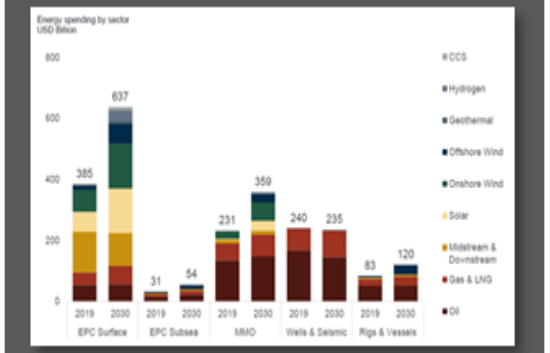
- Supply chain and logistics are now key focus of the C-suite
- Business continuity more important than costs
- Buyer-supplier relations have been altered
- Supply chain workarounds and variation orders are now standard
- The inventory strategy and supply chain models has been changed

PwC have identified four drivers that can impact and change local frame conditions and risk picture

Suppliers margins still under pressure

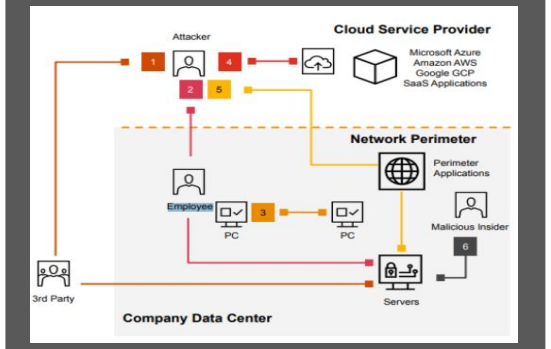


Diversification out of oil and gas and the green shift



Stimulus-driven activity

Digitalization of operations



From global to local in a megaproject perspective

So, are there any other challenges?

Megaprojects have historically a poor track record, and regularly experience cost overrun and schedule delay.

86% fail to meet key objectives

Challenges

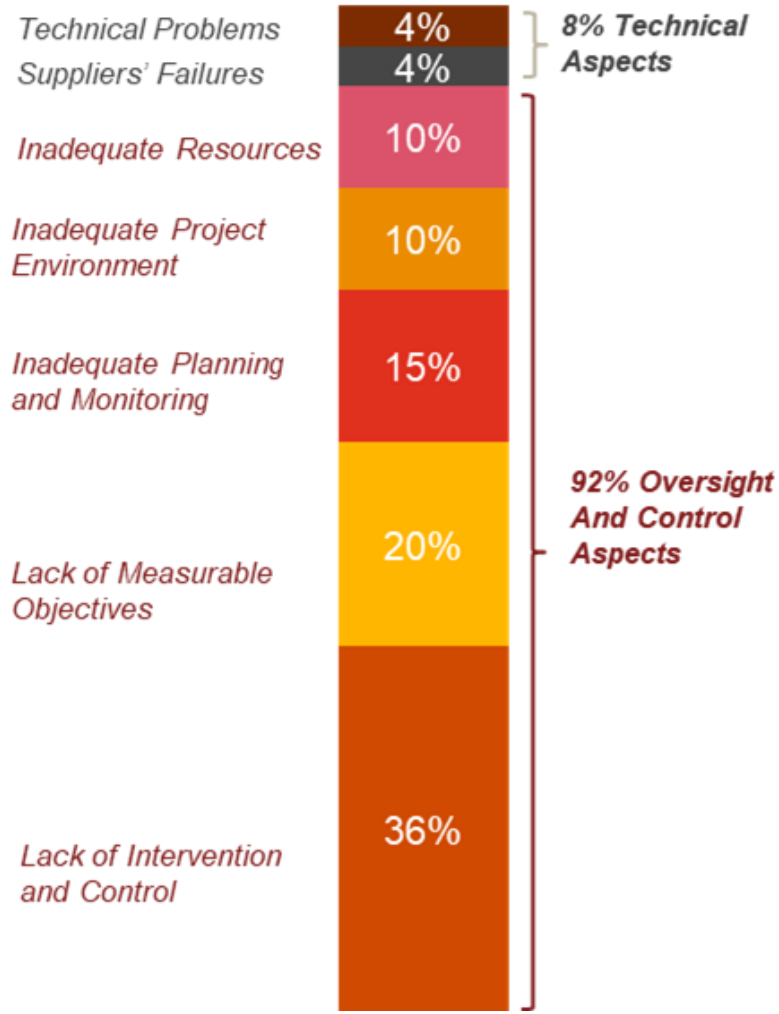
80% *of projects are being effected by technology advances*

45% *of projects delayed by 6 months or more*

37% *cite contractual disputes as a key challenge*

71% *of projects are over budget*

Causes

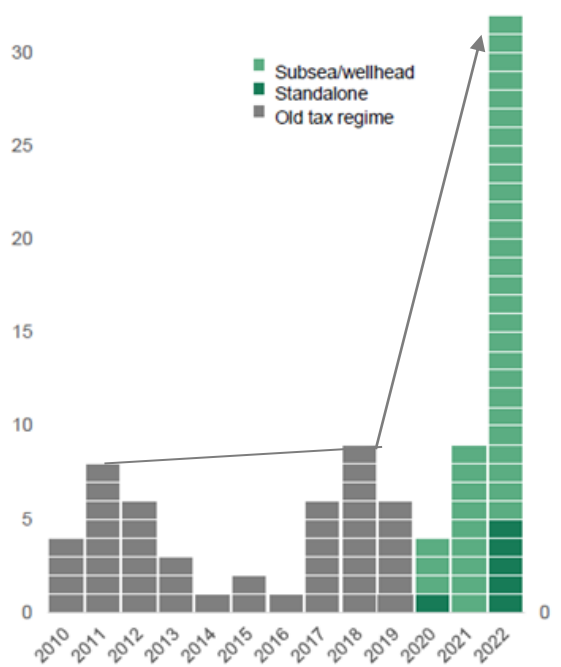


Due to governmental incentives the NCS will initiate 3 times as many field development projects

With the known shortage of competency and capacity due to the ongoing transformation of the energy industry - have the governmental stimulus packages provided significant higher risk factors towards project failure?

Sources:
Rystad data

Historical and potential NCS sanctioning activity with the new fiscal regime, PDO year 2010-2022



Name	PDO-year	Name	PDO-year	Name	PDO-year
Balder Future *Vår Energi*	2020**	Wisting *Equinor*	2022	Grevling/Vette *OKEA*	2022
Hod Dev (IOR) *Aker BP*	2020	Brasse *DNO*	2022	Garantiana *Equinor*	2022
Breidablikk *Equinor*	2020	Shrek *Aker BP*	2022	Akkar *Equinor*	2022
Gråsel *Aker BP*	2020	Trine & Trell *Aker BP*	2022	Solveig ph. 2 *Lundin*	2022
Lavrans *Equinor*	2021	Cape Vulture *Equinor*	2022	Lille Prinsen *Lundin*	2022
Kobra East/Gekko *Aker BP*	2021	Alve North *Aker BP*	2022	Alke South *Vår Energi*	2022
Tommeliten Alpha *ConocoPhilips*	2021	Rolvsnes *Lundin*	2022	Dugong *Neptune Energy*	2022
Hasselmus *OKEA*	2021	Peon *Equinor*	2022	Fogelberg *Spirit Energy*	2022
Frosk *Aker BP*	2021	Linnorm *Shell*	2022	Bergknapp *Wintershall DEA*	2022
Ormen Lange (S) *Shell*	2021	Ørn *Aker BP*	2022	Echino South *Equinor*	2022
Lysing *Equinor*	2021	Halten East *Equinor*	2022	King/Prince *Vår Energi*	2022
Sigrun East *Equinor*	2021	Snøhvit Future 2 *Equinor*	2022	Hades/Iris *OMV*	2022
Smørbukk North *Equinor*	2021	Telesto *Equinor*	2022	Lomre *Equinor*	2022
NOAKA *Equinor/ Aker BP*	2022	Asterix *Equinor*	2022		
Idun North *Aker BP*	2022	Iving *MOL*	2022		
Eldfisk North *ConocoPhilips*	2022	Aurora *OKEA*	2022		

With 40+ projects coming up there will be bottlenecks that increase risk

The challenge is that “megaprojects” are especially vulnerable and affected from global and local influencers

Megaprojects are very large capital investments, typically costing in excess of NOK 1 billion

They attract a high level of public attention or political interest because of substantial impact on local and widespread community, environment, and influence long-term budgeting

Characteristics

- Highly engineered
- Dispersed supply chain
- Complex logistical considerations
- First of a kind technology
- Sensitivity to commodity pricing
- High level of public interest
- Complex contracting strategies
- Complex stakeholder relationships
- Complex cost, schedule, and quality considerations

Challenges

- Unique and interlinked enterprise-level risk
- Failure could mean business failure
- Captures the attention of the local community
- Inability to deliver erodes business confidence and impacts future growth
- Failure can be very public and very embarrassing
- Demonstrated and material impact on share

Lesson learned from PwC supporting megaprojects

Governance & setup

- Imbalance between execution, oversight, and assurance functions
- Lack of integrated project team and/or consistent leadership
- Lack of user involvement during project reviews
- Financial stability of delivery team
- **Need to have ability to scale up to meet increased or changed resource demands**
- **Assess vendor ability to scale up to meet increased resource demand**
- **Verify reliance on external vendor experience vs establishing internal capabilities**

Planning & Controls

- Failure to properly allocate risks and rewards (risk appetite)
- **Over-reliance on contract's ability to mitigate risk**
- Incomplete/ambiguous business objectives/requirements
- Uncertainty and assumptions due to underdeveloped project planning
- **Optimism bias and lack of scenarios towards capital costs and schedule**
- Lack of well-documented policies and procedures
- Overly aggressive schedules and budgets
- **Poor planning around logistics of labor and materials**

Technology & Digital

- Lack of integrated project management systems
- **Lack of scenario and data driven approach**
- Project data held in off-line, ad hoc tools
- Manual reconciliation of data in project vs. corporate systems
- Manual documentation and manipulation of data to produce project reporting
- "**Lagging" vs. real-time vendor progress reporting**
- Different "sources of truth" for documentation of changes and approvals
- Lack of adoption of new processes due to limited stakeholder involvement

Any advice?

Be proactive and forward looking

Increase investment in critical data and insight to proactively respond to changed, new and emerging risks

Recent events and uncertainties have underscored the need for organisations to be more **proactive** in scanning the horizon for risks, including everything from local challenges, industry regulations to systemic global disruptions.

Based on our experience a range of new **interlinked threats** is now emerging, many of which have no precedent, so we can't use past events to tell us what comes next. Instead, you need to think about what you've learned in the past about handling major disruption and use this to prepare a flexible response to future threats..

Advice for the Project leadership:

The following four priorities should help deliver sustained outcomes and build resilience toward uncertainty

Build and validate 22-26 scenarios

Boards and top management should evaluate and update the scenarios for the next 3-5 years and use the internal and external scenarios as foundation for capability plans, project delivery and collaborative/sourcing opportunities

Recalibrate capability plans

Based on scenarios and the activity and contractor landscape the C-suite need to recalibrate capability plans to underpin the scenarios and mitigate risk of supplier shortfall and churn affecting organisation, planned and ongoing megaprojects

Explore collaboration opportunities

Actively explore collaborative and JV options to secure shared access to capabilities and resources to overcome potential shortfalls in capabilities and resources.

Some scenarios will require co-innovation models which will likely be completely new, but the industry has a history of innovating in the face of adversity.

Rethink sourcing opportunities

Based on scenarios actively calibrate supplier collaboration/relationships and supplier delivery of strategic resources for operations and forthcoming projects

Optimize Business Management Systems

The management systems describe the way you work and operates and hence an important barrier - make sure that the management system are up-to date and act as an barrier.

A solid BMS increases resilience, allowing for easier onboarding of new resources and acts as a baseline for future operating model adjustments.

Thank you!

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Appendix - some ways to reduce risks for projects

PwC

November 2022

Ikke med i foredraget

PwC view of Megaprojects Excellence

Integrated, scaled, prioritized

Planning and prioritize programs to ensure **strategic objectives** of the development **portfolio** will be met.

Portfolio management, optimization and governance

Assess **project performance** against specified standards and **monitor project status, risks** and mitigation effectiveness.

Performance insight through **advanced analytics** and reporting

Integrated Project and corporate **Technology**

Implement and effectively **utilize technology** to manage and monitor projects status, **performance and outcomes**.

Capital Project Excellence

Integrated components

Balance the project delivery organization, **resources, skills and competencies** to meet governance, oversight and execution mandates.

Project and Team **Organizational Effectiveness**

Project **Execution Strategy** and Planning

Develop a series of **coordinated plans** setting out the principles of how each project will be delivered and **interfaces managed**.

Project controls, risk mitigation and governance

Create a project **controls and governance framework** including processes, standards, and templates required for full cycle project delivery.

Portfolio Management, Optimization & Governance

GOAL	Ensure program planning and prioritization is aligned to strategic objectives at the outset, and all programs within the portfolio are delivered within a robust governance and controls environment.
STRATEGIES	Megaproject focus: Objective governance and oversight structure, Disciplined stage gate process

Enablers

Strategic alignment: Project selection and prioritization based upon criteria, constraints, and long terms strategy. Robust control through disciplined stage gate and funding mechanisms.

Decision making authority: Defined roles, accountability, and interfaces in the decision making process.

Governance framework: Overarching organizational, process and procedural requirements to be applied throughout the lifecycle of projects across the portfolio.

Impact

Robust plan and strategy

Consistent, and integrated approach across all programs to manage risk and ensure strategic objectives are met.

Capital efficiency

Direct and indirect financial, and non-financial outcomes identified, optimized, and tracked throughout the project life.

Example

PwC was engaged by a public sector client to review the current state of its portfolio, and alignment to the strategic objectives. Our work helped the client focus its priorities on a five-yearly planning period and enabled it to report to central government on the achievability of all programs.

Project Governance Structure

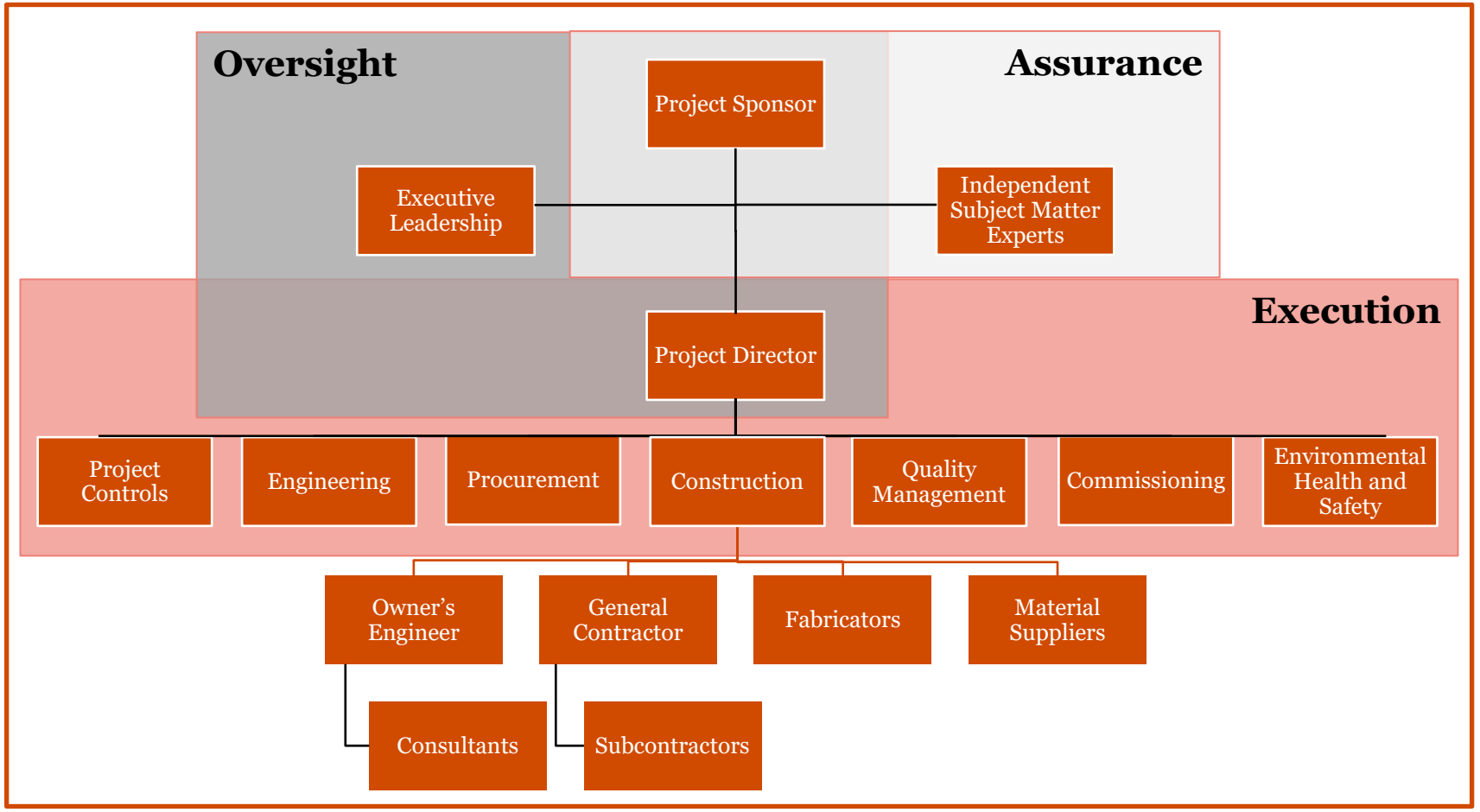
Governance requires clearly defined roles for:

- Execution
- Oversight
- Assurance

Objectives:

- Transparency
- Accountability
- Audit Trail

Indicative Example



Project and Team Organizational Effectiveness

GOAL	Balance the project delivery organization, resources, skills and competencies to meet governance, oversight and execution mandates.
STRATEGIES	Megaproject focus: Roles and responsibilities, Internal capabilities, Resource forecasting, Stakeholder management

Enablers

Right sizing: Team designed and sized to meet project, program, portfolio demands; while also utilizing technology to optimize resources and increase efficiency.

Structure: Clear responsibilities, accountability and goals associated with each role, but flexibility in the deployment and staffing of roles at different stages of the project.

Skills development: Strategy and materials for onboarding, training, ongoing coaching and development at all levels, for both permanent and contract employees

Impact

Fit for purpose

Team has the ability to adapt to specific needs as they evolve through the lifecycle.

Unified approach

Integrated responsibilities, common goals and intelligent use of technology ensure all members of the team are working as one..

Example

We assisted a Fortune 500 company in the design and setup of the organization for a multi billion new build Global HQ campus. Taking into consideration the planned procurement strategy for the project, we developed the roles and associated RACI responsibilities required to deliver the project, and designed procedures for communication and decision making workflows.

Project Execution Strategy & Planning

GOAL:	Build and maintain a coordinated execution plan and contracting strategy, which mitigates Owner risk, and provides a framework for the management of critical interfaces.
FOCUS AREAS	Megaproject focus: Contract strategy, Risk allocation and monitoring, Integrated planning

Enablers

Integrated planning: Structured workshops with all stakeholders throughout the project to identify, evaluate and document all interfaces (intra-project, and between projects and programs).

Definition: Clear definition of scope, scope boundaries, deliverable / completion dates and responsibility matrices.

Risk allocation: Determination of the most appropriate, and best able party to manage identified risks. Risk allocation aligned to Owner's risk appetite.

Contracting strategy: Forms of contact, payment mechanisms, savings schemes selected to realize planning, scope, and risk allocation decisions.

Impact

Interfaces minimized

Complex interfaces are eliminated by work packaging and contracting decisions where possible, or carefully planned and controlled if not.

Mitigation of risk

Risk ownership is clear to all, allowing effective tracking and response by the assigned party, rather than risks laying silent until issues arise.

Example

We were engaged by a global health services entity to support the prioritization and planning of a national US facilities optimization project. The program impact more than 100 existing sites, four different business units, and a mix of office, clinical facilities, and warehousing. We conducted workshops to understand constraints, interfaces and requirements at all levels, to develop a program wide plan and approach.

Project Controls, Risk Mitigation & Governance

GOAL:	Design and implement a framework of policies, processes and tools, built around specific project and stakeholder requirements to control cost, schedule, quality and risk.
FOCUS AREAS	Megaproject focus: Independent cost and schedule validation, Quantitative contingency analysis, Supply chain

Enablers

Transparency: Framework of processes and procedures cutting across all aspects of the control environment, and aligned with the needs of each project stage.

Accountability: All parties well informed on accountability for project controls, as dictated by the chosen contracting strategy.

Meaningful audit trail: Information needed to ensure that project stakeholders are performing in their required roles.

Active risk management: Foresight and analysis of risks and opportunities to drive proactive decision making, mitigation and/or response.

Impact

No surprises

Transparent early identification and warning of cost, schedule, quality, risk, and health and safety status, risks and issues.

Effective governance

Full control of decision and approvals points. Accountability understood and documents maintained.

Example

We supported a technology company with the design and standup of the governance and controls framework for a program of facilities expansion projects. Multiple GC packages resulted in thousands of unresolved claims between parties. The robust controls we established at the outset enabled the Client to effectively interrogate and substantiate a position on all claims, and allow a more timely and cost effective close out.

Project Insight Through Advanced Analytics & Reporting

GOAL:	Establish and assess projects against a robust baseline, and use data analytics and augmented reality to identify trends and likely future outcomes.
FOCUS AREAS	Megaproject focus: Automated vs. manual processes, Leading vs. lagging performance indicators, Digital enablers

Enablers

Performance baseline: Sound baseline for cost, schedule, and quality, aligned to organizational and contract strategy, and reporting requirements.

Project data: Wide array of high quality, timely project data, allowing real time monitoring, analytics, trending and response.

Innovative technologies: Drones, laser scanning, RFID tagging, smart glasses, IoT sensors etc. for data capture, and dynamic dashboards for reporting (e.g. tableau, Power BI, Qlik)

Impact

Foresight
Powerful insight and trending through big data and AI predictive analytics

Stakeholder confidence
Consistent real time analytics and reporting, providing a single source of the truth across all projects and programs in the portfolio.

Performance trending
Leading indicators, enabling proactive decision making, risk reduction, and cost avoidance.

Example

PwC was engaged by a US public utility to monitor the construction of a new build power station. The team identified specific work activities of concern, and established a performance measurement and reporting regime to monitor weekly trends, provide a real time completion forecast, and identify inefficiencies in the construction process.

Integrated Project & Corporate Technology

GOAL:	Implement and effectively utilize technology to manage and monitor projects status, performance and outcomes; while boosting organizational efficiency and collaboration.
FOCUS AREAS	Megaproject focus: Integrated project system landscape, Automated vendor interfaces, Mobility enhancements

Enablers

Technology fit: Project needs and stakeholder requirements fully assessed and met through a suite of integrated tools.

Process driven: Tools configured to project specific process and reporting requirements, vs. driven by the technology itself.

Project – enterprise integration: Seamless communication between project level and enterprise systems removing the need for manual processes.

Impact

Elimination of manual processes

Automated workflows, streamlined inputs, and data analytics allow the project team to spend less time processing data, and more time using it.

Insight anytime, anywhere

Reporting can be accessed in the office and in the field, presented in a dynamic way to allow real time analysis.

Example

PwC assisted a major energy company with the selection, design, and implementation of a suite of project technology solutions for cost, schedule, risk management and document control. We gathered detailed requirements from all business functions at the outset, and designed processes and procedures for the various software solutions to be built around. Post implementation we provided ongoing training and coaching.

Thank you!

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