Workshop on
Upstream Oil and Gas Project Management

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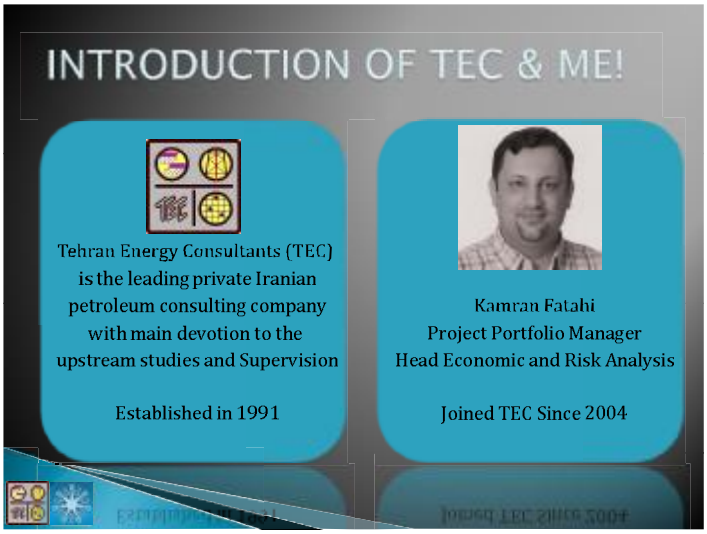
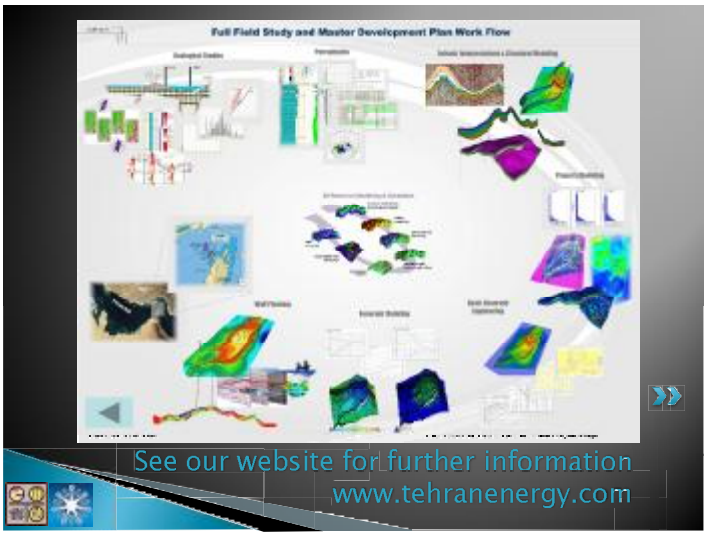
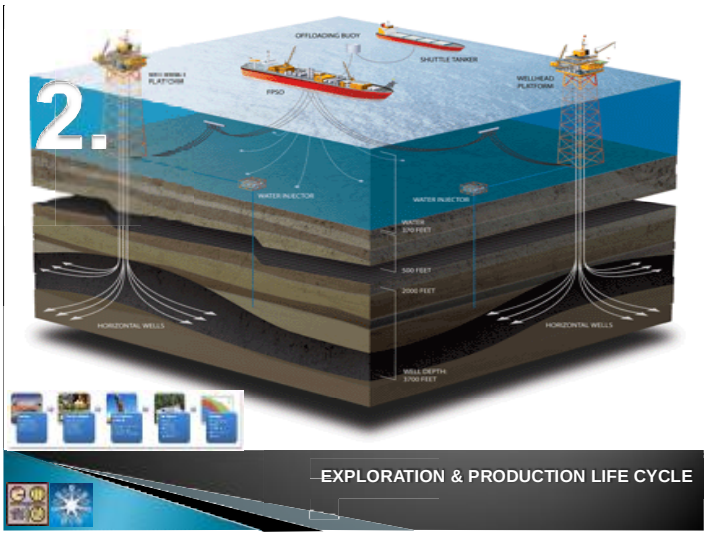
Presentation Structure

1. INTRODUCTION (TEC & ME!)
2. EXPLORATION & PRODUCTION LIFE CYCLE
3. E&P MEGA PROJECTS ASPECTS
4. SHELL CASE STUDY IN AN IRAQI FIELD
5. PROJECT MANAGEMENT CHALLENGES





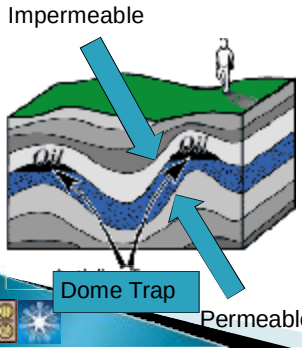


INTRODUCTION - YOU !

It's your turn!

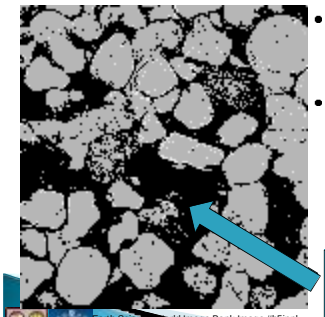
- Your name
- Your role and who you work for
- Experience in Projects

Exploration and Production (1): Oil Traps



- Some rocks are permeable and allow oil and gas to freely pass through them
- Other rocks are impermeable and block the upward passage of oil and gas
- Where oil and gas rises up into a dome (or anticline) capped by impermeable rocks it can't escape. This is one type of an Oil Trap.

Exploration and Production (2): Reservoir Rocks



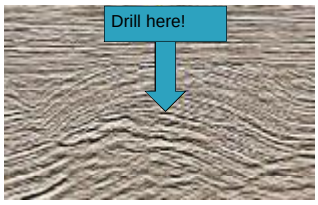
Earth Science World Image Bank Image #h5innl

- The permeable strata in an oil trap is known as the Reservoir Rock
- Reservoir rocks have lots of interconnected holes called pores. These absorb the oil and gas like a sponge

As oil migrates it fills up the pores, (oil-filled pores shown in black)

Exploration and Production (3): Seismic Surveys

Earth Science World Image Bank Image #h5inor



Earth Science World Image Bank Image #h5inpj

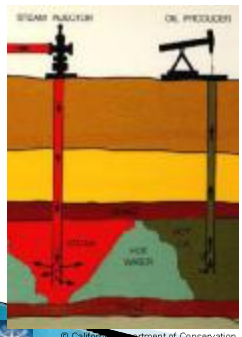
- Seismic surveys are used to locate likely rock structures underground in which oil and gas might be found
- Shock waves are fired into the ground. These bounce off layers of rock and reveal any structural domes that might contain oil

Exploration and Production (4): Drilling the well

en.wikipedia.org/wiki/Image:Oil_platform.jpg

- Once an oil or gas prospect has been identified, a hole is drilled to assess the potential
- The cost of drilling is very great. On an offshore rig, it may cost $10,000 for each metre drilled.
- A company incurs vast losses for every "dry hole" drilled

Exploration and Production (5): Enhanced Recovery

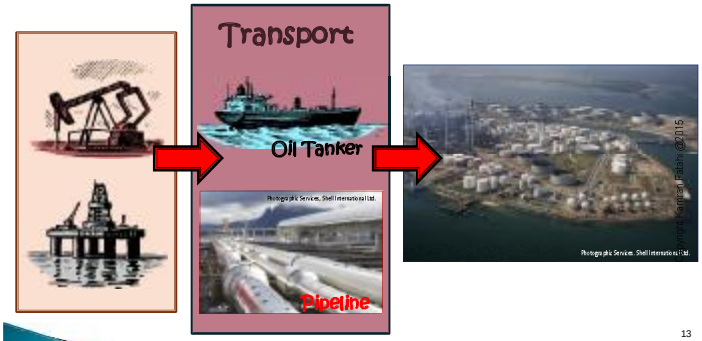


© California Department of Conservation

- Although oil and gas are less dense than water and naturally rise up a well to the surface, in reality only 40-50% of the total will do so.
- To enhance recovery, a hole is drilled adjacent to the well and steam is pumped down. The hot water helps to push the oil out of the rock and up into the well.

Production

- Transport



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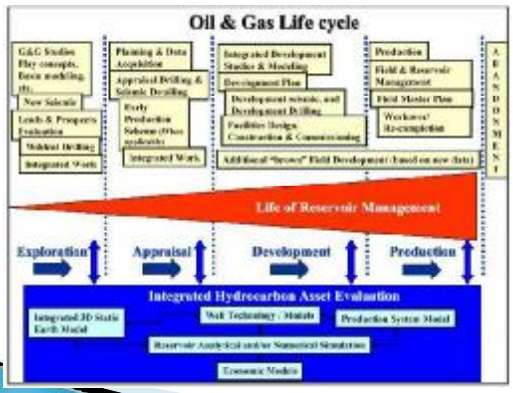
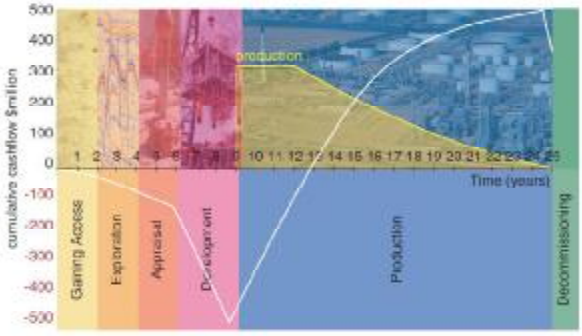
Oil and Gas Life Cycle



The Field life cycle and typical cumulative cash flow



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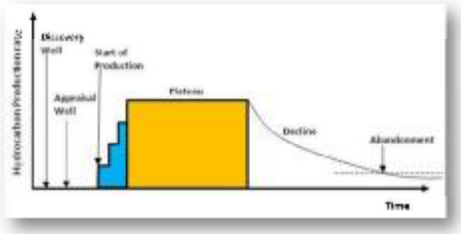
Main E&P Activities

Production Profile



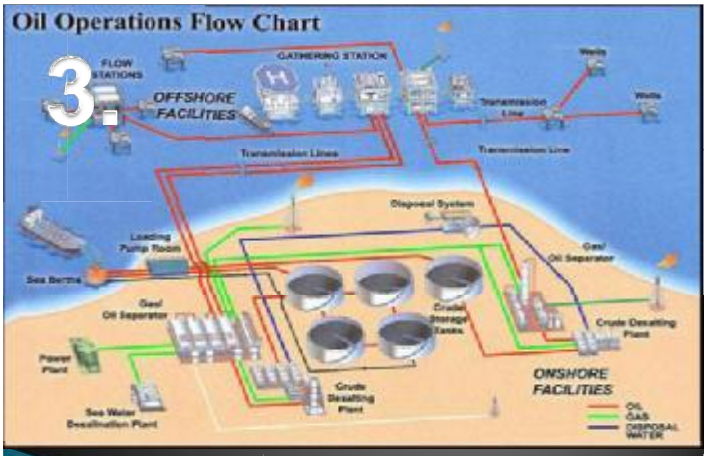
Industrial Mega Projects Data

TABLE 1—CURRENT MEGAPROJECT DATABASE

Industrial Sector	Number	Percent of Sample
Oil and gas production	130	41
Petroleum processing and refining	66	21
Minerals and metals	47	15
Chemicals	31	10
Liquefied natural gas (LNG)	24	8
Power generation	8	3
Pipelines	7	2
Other	5	2
Totals	318	100*

*Does not add because of round-off error.

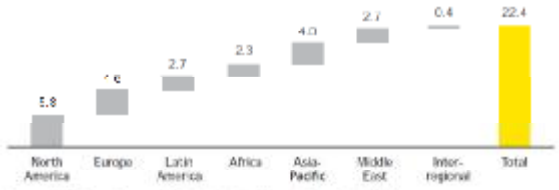
Oil Operations Flow Chart



E&P MEGA PROJECTS ASPECTS

Oil and Gas Mega Projects Investments

Figure 1: Regional cumulative oil and gas investment between 2014 and 2035 (US$t)



Source: World Energy Investment Outlook, International Energy Agency, June 2014.

Oil and Gas Mega Projects Investments

- In its Outlook, the IEA expects oil and gas spending to increase sharply, increasing by almost 50% from its average of US$678b per year over the 2000–2013 period.
- Industry spending will continue to be dominated by spending in the upstream segment — accounting for about 77% of total industry spending.
- Midstream or transportation-related spending, in particular for pipelines and storage, will account for about 13% of total spending, with cumulative natural gas transportation spending of about US$1.9t and
- oil transport spending of about US$1t over the 2014–2035 period.
- Downstream spending will account for the remaining gas (LNG) projects of about US$0.7t.
- In total, oil-related spending will account for about 61% of total spending, with the remaining 39% made up of natural gas-related spending

Evaluating the performance of megaprojects

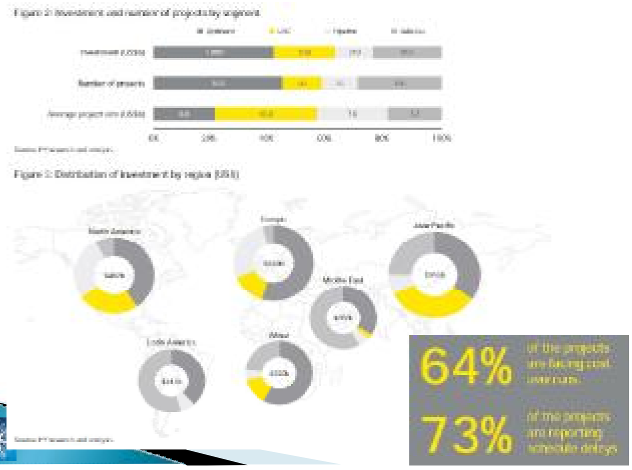
TABLE 4—COMPARING E&P AND NON-E&P MEGAPROJECT OUTCOMES

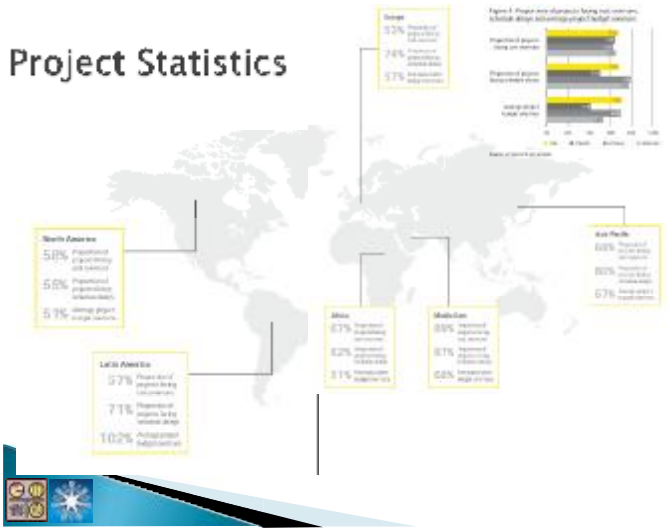
Measure of Merit	Upstream Megaprojects	Other Megaprojects
Cost overrun (%)*	23	10
Cost competitiveness % of industry average capex**	127	1.11
Slip in execution schedules (%)†	22	15
Severe and continuing production shortfalls††	45	32

* [illegible]
** [illegible]
† [illegible]
†† [illegible]

- As seen in above Table, the typical oil and gas megaproject was very expensive, and a great deal more expensive than planned.
- It was also nearly a year late.
- Worst of all, it was frequently quite disappointing in terms of production. The failure to produce is by far the most economically damaging result.

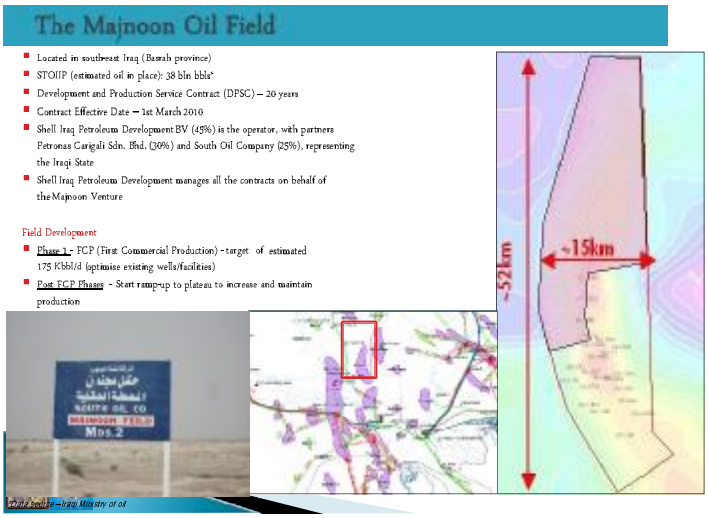
Evaluating the performance of megaprojects




Project Statistics


Shell Oil & Gas Activities in Iraq
Mounir Bouaziz
Vice President
Middle East & N. Africa
Shell Iraq Petroleum Development BV


4.
Shell
SHELL CASE STUDY IN AN IRAQI FIELD


The Majnoon Oil Field
Located in southeast Iraq (Basrah province)
STOIIP (estimated oil in place): 38 bln bbls*
Development and Production Service Contract (DPSC) – 20 years
Contract Effective Date – 1st March 2010
Shell Iraq Petroleum Development BV (45%) is the operator, with partners Petronas Carigali Sdn. Bhd. (30%) and South Oil Company (25%), representing the Iraqi State
Shell Iraq Petroleum Development manages all the contracts on behalf of the Majnoon Venture
Field Development
Phase 1 - FCP (First Commercial Production) - target of estimated 175 Kbbl/d (optimise existing wells/facilities)
Post FCP Phase - Start ramp-up to plateau to increase and maintain production
~52km
~15km
MAJNOON FIELD
Mds.2

Majnoon - Latest Project Developments

- Drilling programme targeting new 15–20 wells ongoing – two drilling rigs in place, a third rig on its way.
- Several production shut-down programmes as part of facility maintenance and inspection.
- In addition to the Majnoon Pioneer Camp, other 9 camps (contractors) are being built. 1800 workers in the field and an estimated 1300 jobs provided to local community members to date.
- Jetty construction has concluded. This will allow the transportation of Early Production System (EPS) equipment through the Shatt'Al Arab water-way, thus minimizing road transportation.
- Several Social Investment projects (SI) delivered within the areas of Education, Health and Capacity building.

Majnoon Camp and Infrastructure

Overview of Pioneering Camp

Recreational facilities in Pioneering Camp

- No existing facilities in Majnoon - all infrastructure to be built by Project
- Planned capacity of 6501 beds after expansion of Pioneer Camp and Zaitoon Camp
- Further 2000+ beds in multiple Contractor Camps

Supporting Infrastructure:
- Security posts and checkpoints
- Waste management
- Temporary facilities (warehouses etc.)
- Training Facility

Local Infrastructure Upgrades:
- Al Dayr Road (1km + 2 intersections)
- Al Nashwa Road (12km)
- Various minor community projects

MFD: Explosive Remnants of War (ERW) Clearing

ERW Team - Performing to World class Standards

Metal contamination

- Around 100.000 m2 cleared per day
- To date more than 9.000.000 m2 cleared
- Over 250 staff from 4 different contractors
- Well over14000 items removed and made safe
- Largest item 500 kg explosive

Collection of ERW

Brownfield Photos

Accumulator and Flash drum PSV platform

Metering Skid Foundation Pedestal

DS1 - Bypass line installation and welding

DS1 Instrument Air Receiver installation

Greenfield Photos

Piling for Train 1 skids

Piperack Module 21 lifted by 600T crane and fitted with Module 23

Produced water tank foundation

Crude Oil buffer tank foundation

Well Operations

MJ-E22a-02, core 3. Top of core at surface –

Rescue at height Emergency Response exercise (stretcher)

The first class of well trainees start with SIPD March 2012

MJ-E22a-01 The first newly drilled & completed SIPD well

Civil Works and Repairs

MJ-19 being prepared for the arrival of the workover rig

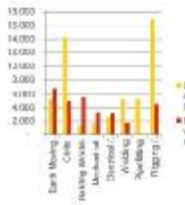
Pile driving unit on location at MJ-E22 drilling pad

Pouring concrete between cellars at MJ-E20 drilling pad

Failed equipment changed on existing wells to restore integrity

LOCAL STAKEHOLDERS AND CSR

Focus on Iraq Local Content



Local Content Initiatives:

- Develop resourced plan to assist local training centers/schools in upgrading of curriculums / facilities/capacity.
- Implementation of local accreditation system.
- Develop "Shell" Training Center in Basrah Region.
- Development of new programs, including construction trade specific, English language, HSSE, Train the Trainer etc...
- Planned endowment fund via Shell Foundation and UNDP for business development center for environmental and community projects in Basrah.

Hiring Procedures and Local Committee in place; approximately 1300 workers already recruited from Majnoon field Communities

Social Performance in Iraq

Awareness campaign at schools in Al Nashwa and Al Dayr communities as part of the health prevention program

Road safety awareness campaign at schools in Al Nashwa and Al Dayr communities (37 schools)- Completed

Scholarships for young unemployed

Dredging of the canal in the Halechee village

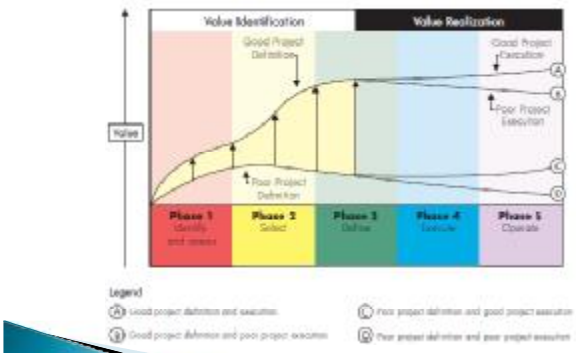
Distribution of food parcels during Ramadan - Completed.

Equipment and training in Al Nashwa clinic (ultra sound and ECG) - Completed

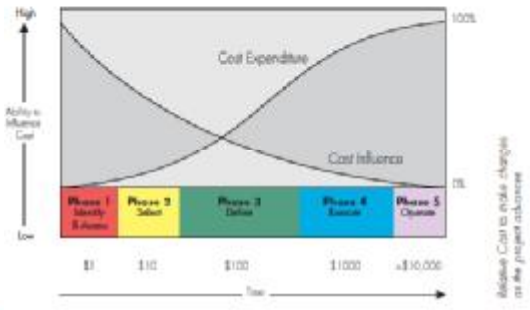
Understanding the Poorer Outcomes in E&P Projects

- There are three major factors that, taken together, explain the poorer outcomes of upstream megaprojects.
- All three are manifestations of the industry's struggle to effectively integrate the functions that are needed to produce excellent upstream projects.
- The three factors are:
  - Front-End loading (FEL)
  - The Effects of Turnover in Project Leadership
  - The Drive for Speed

Influence of Front End Loading on Project Outcomes



Front End Loading



Contracting Strategy Matrix

Determining the preferred contracting strategy involves many aspects:

- contractor availability and compatibility
- host government position and influence
- Company's own resource availability CHR and activity assets
- market forces
- local content issues

In developing the Contract Matrix the following critical success factors need to be considered/covered:

- retention of single point responsibility for managing each contract (and contractor or partner)
- the availability of suitably qualified contractors and suppliers, with acceptable quality and HSE management systems
- the ability to integrate contractors effectively into the project

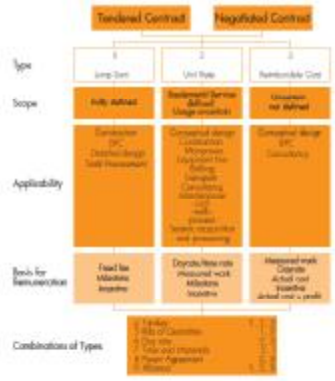
Commercial Strategy

Commercial Strategy includes:

- how the contractor should be remunerated by the Company
- how payment and cost control will be established
- how negotiations should be handled

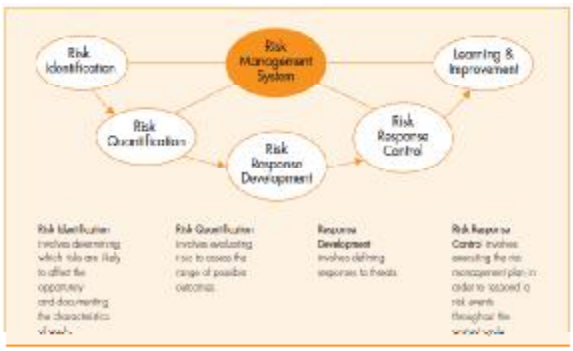
The three basic methods of contractor remuneration used in EP are:

- Lump sum
- Unit rate
- Reimbursable cost

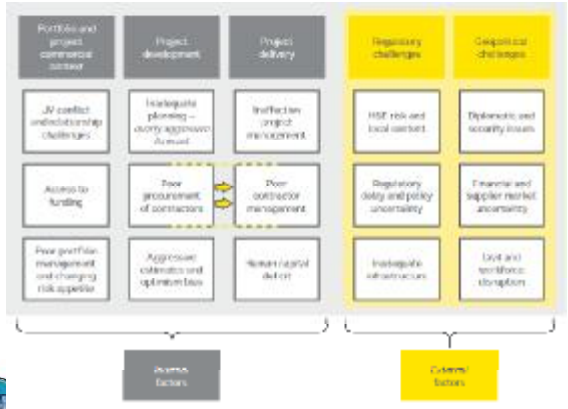


Categories of risks

Risk Management



Root causes of cost overruns and delays



Portfolio and project commercial context

The commercial context in which projects are developed is:

- critical to project success, often determining:
- Skills and resources available
- Cost of capital
- Partners involved
- Total risk taken on by each stakeholder

Key challenges:

- Joint ventures (JVs)
- Access to funding
- Portfolio management and project selection

Project delivery

- The delivery of megaprojects is an expensive, highly complex task that entails the combination of leading-edge technology, operation in new geographies and multiparty governance.
- The sheer size and scale of current and proposed projects present challenges for the project team and owner organizations throughout the project life cycle, especially in delivery, where capital expenditure and schedule demands are at their greatest.
- Key challenges:
  - Ineffective project management
  - Poor contract management
  - Human capital deficit

Project development

In line with the adage "Failing to plan is planning to fail," experience shows that a lack of appropriate front-end loading and an unhealthy focus on project sanctioning often results in the setting of unrealistic, overly aggressive goals which become serious delivery issues as projects move beyond FID into delivery.

- Key challenges:
  - Inadequate planning
  - Procurement of materials and delivery contractors
  - Aggressive estimates and optimism bias

Regulatory challenges

- Increasing focus on the environmental impact of projects, greater regulatory requirements and continued policy uncertainty all impact project performance.
- These regulatory demands are likely to continue to increase.
- Key challenges:
  - Health, safety and environment (HSE) and local content
  - Regulatory delay and policy uncertainty
  - Inadequate infrastructure

Geopolitical challenges

- External factors and political forces also influence the progress of megaprojects.
- Given the value of the investments at stake, the impact of any major change in these forces can be severe on the overall project economics, meaning that in some instances companies may consider delaying or even canceling projects.
- Key challenges:
  - Diplomatic and security issues
  - Financial and supplier market uncertainty
  - Civil and workforce disruption

Conclusion

- It's critical to determine how controllable these factors are and the extent to which they could result in cost and time overruns.
- Clearly the external environment and regulatory–and policy related are less controllable or predictable than project management issues, stakeholder conflicts and resource constraints.
- These issues aren't so easily controlled or able to be forecast, the industry can do far more to mitigate and prepare for them so that their effects can be more adequately managed within the project environment.