

Project Controls Expo – 22nd Nov 2018

Melbourne Cricket Ground, Melbourne

A Perspective on Major Projects

About the Speaker



Les Guthrie

- 40+ years of international experience in project delivery and leadership within the Oil & Gas, Mining and Infrastructure sectors, as
- Roles as both owner & contractor
- BHP Billiton, BG Group, Aker Kvaerner, Fluor, Rio Tinto

Agenda

- Introduction
- Global Trends in Major Projects
- Projects Today
- Some Common Causes of Project Failure
- Conclusions and Observations

Introduction - What is a project?

**Within the context of your
organisation what is a project?**

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organisation what is a project?**

**A vehicle for the delivery of a service or a product - which supports
or enhances the objectives of the organisation.**

Introduction - What is a project?

What is a project?

“a collaborative enterprise, involving research or design, that is carefully planned to achieve a particular aim” (**Oxford English dictionary**)

“temporary rather than permanent social systems or work systems that are constituted by teams within or across organizations to accomplish particular tasks under time constraints” (**Stephen Manning**)

“A temporary endeavour undertaken to create a unique product, service or result” (**PMI Body of Knowledge**)

Introduction - What is a project?

Some immutable elements of projects:-

- ❑ **Finite** - projects are defined as having a **beginning** and an **end**
- ❑ **Constraints** - this is most usually accepted to be **time** but may also be place or finance or resources, etc.
- ❑ **Resources** - projects employ resources, which can be time, money, raw materials, equipment, intellectual property, etc.

Introduction - What is a project?



The Great Pyramid of Giza

- ❑ Completed around 2560 BC
- ❑ The tallest man-made structure for 3800 years
- ❑ 20 years to complete

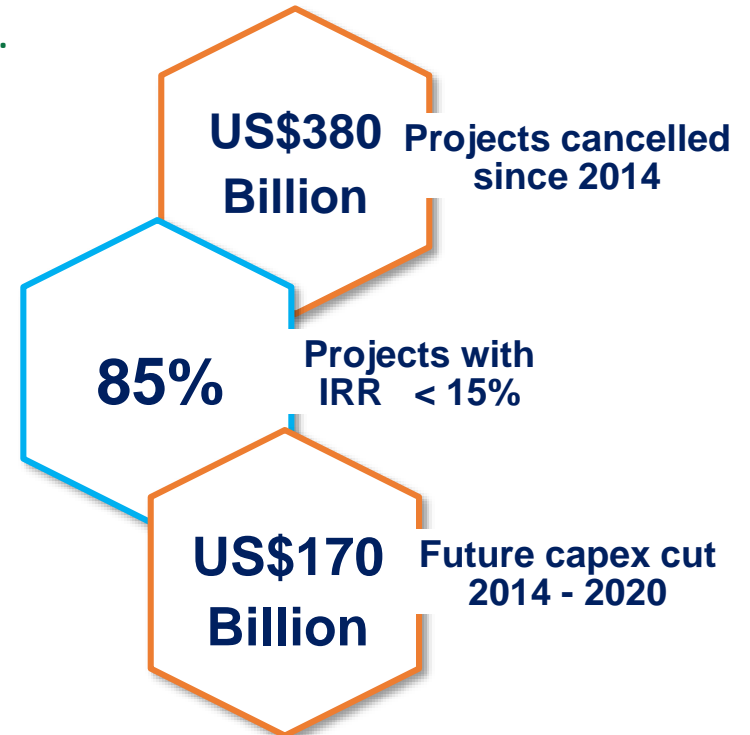
Global Trends in Major Projects

The Oil & Gas sector has seen tough conditions since 2014

The collapse of global oil price led to a sharp reduction in capital expenditure on new project development.



Source: Macrotrends, 2018 NYMEX Crude Oil Prices



Source: Wood Mackenzie

Current outlook for Oil & Gas is improving.....



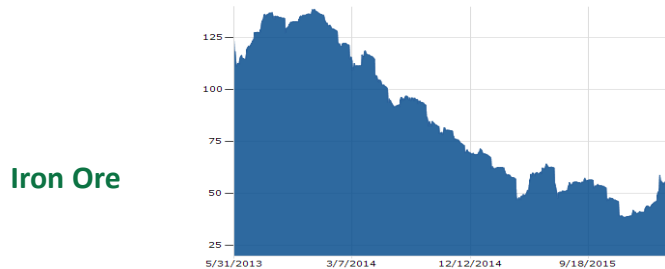
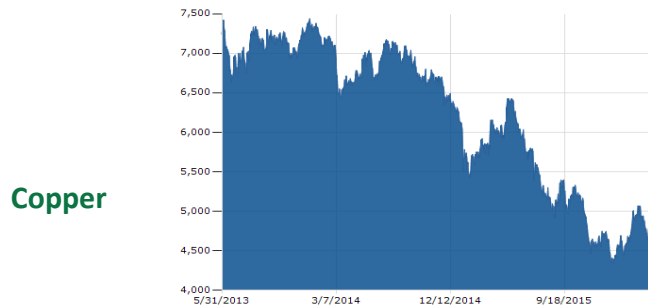
Source: Macrotrends, 2018 NYMEX Crude Oil Prices

Recent improvement in pricing and cost efficiencies has created an opportunity for significant new capital investment.

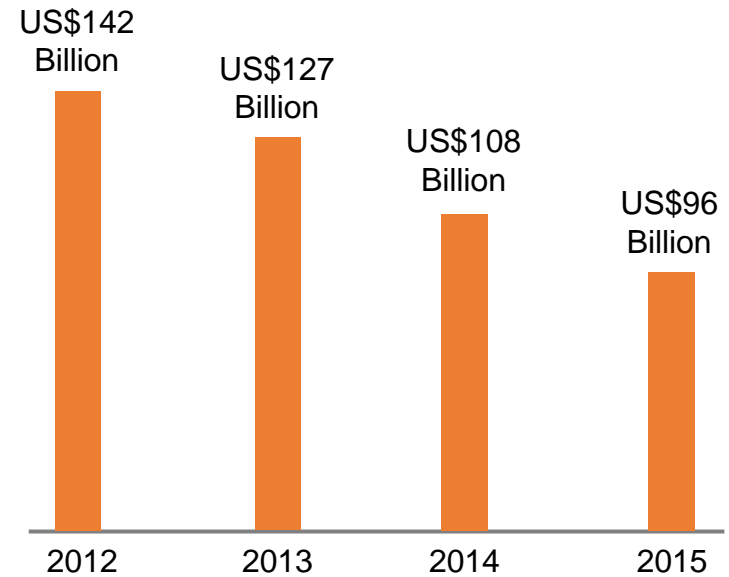
- US crude export ban removal in 2016
- OPEC (& Russia) cut production in 2017
- LNG demand continues to rise – but increased supply likely to moderate new investment

Source: Deloitte Centre for Solutions, 2018 Outlook on Oil & Gas

The Mining sector was also hit hard....



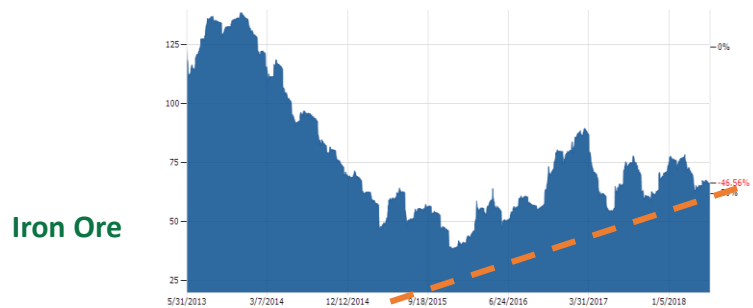
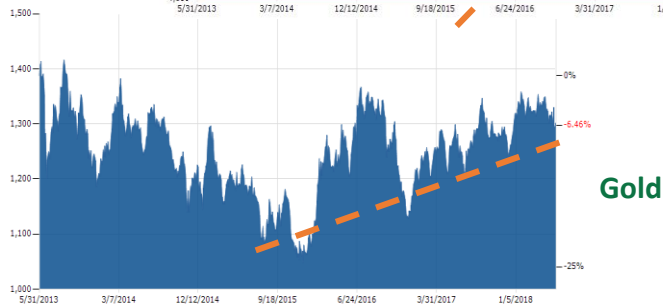
Similarly the collapse of global commodity prices led to a sharp reduction in capital expenditure on new mining projects.



Source: Markets Insider

Source: EY Analysis, BMI

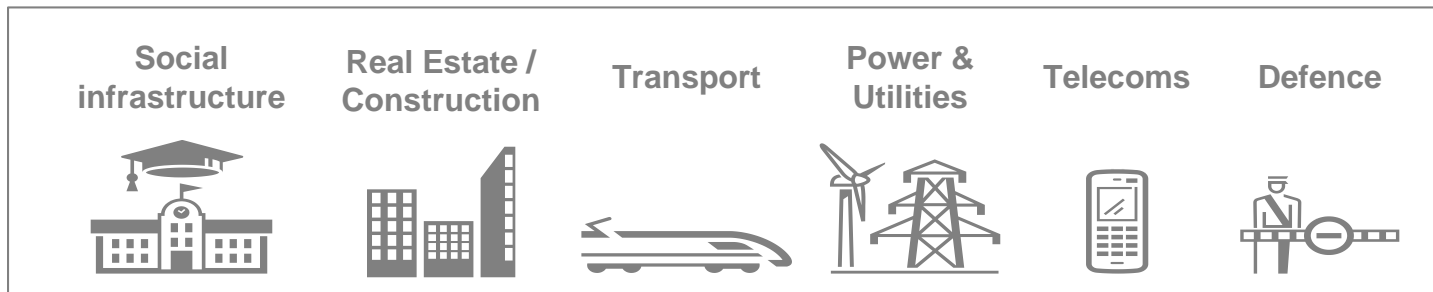
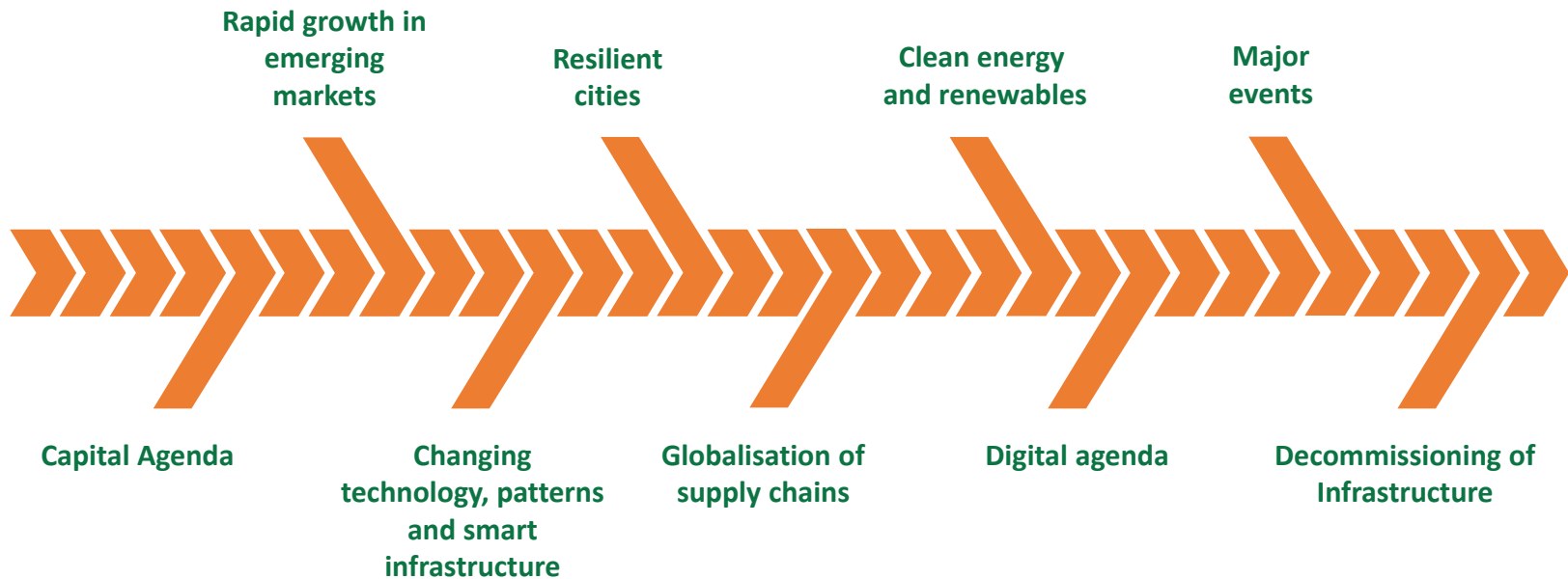
Like O&G, the recent outlook for Mining, is looking more positive....



Source: Markets Insider

Recent improvement in major commodity pricing plus significant cost reduction benefits across all mining sectors is already being seen in new capital investment

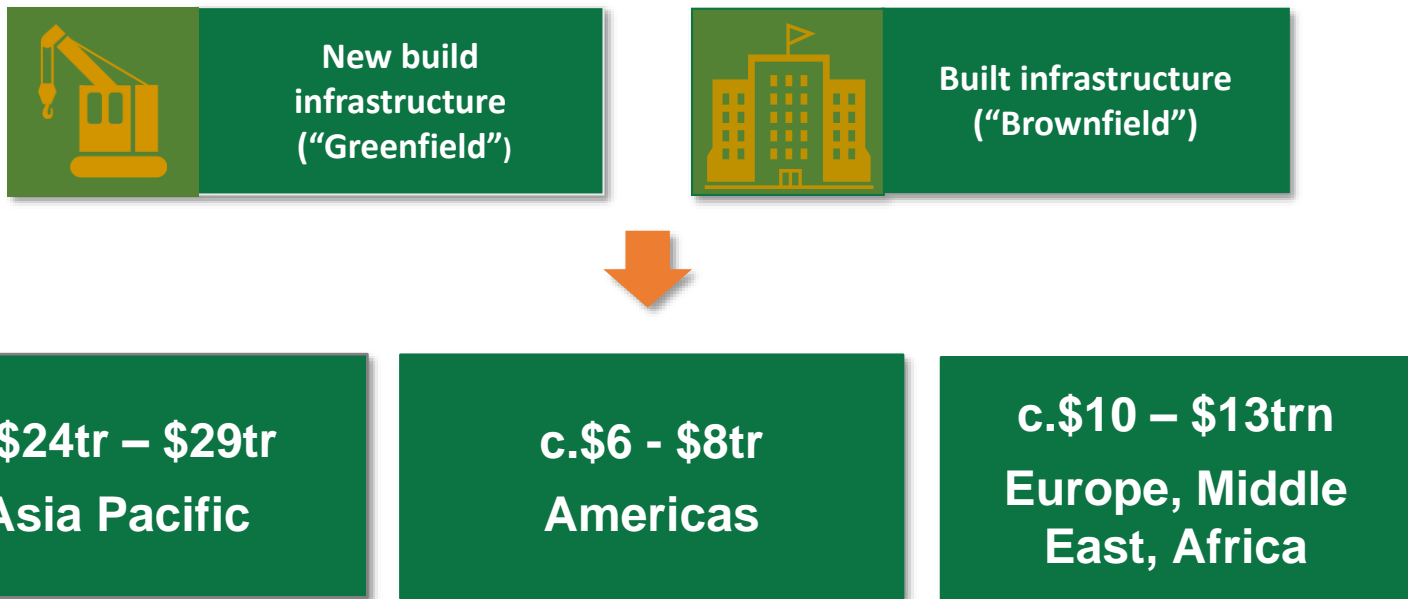
Global trends are driving major changes in large scale capital infrastructure



Source: EY Analysis, BMI

..... a \$50 trillion infrastructure opportunity, with more than half being spent in Asia Pacific

Projected Global Infrastructure spending (2010-2030): **\$40 - \$50trillion**



Source: EY Analysis, BMI

Projects Today

Projects Today – complex .. and expensive



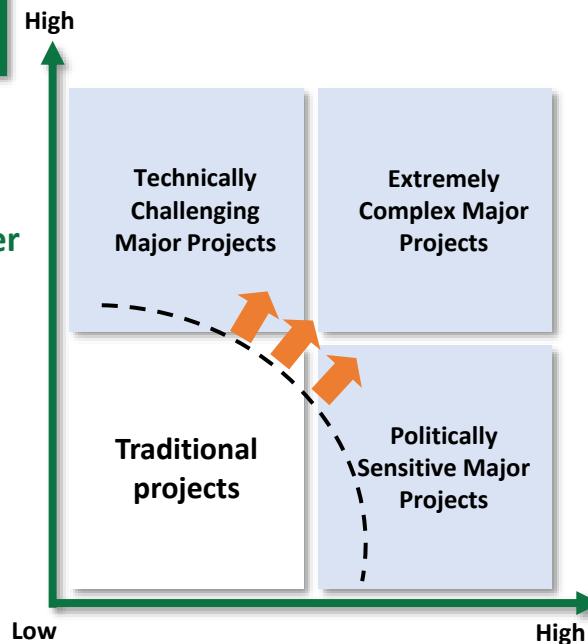
Projects Today – complex .. and expensive

Knowledge Intensity

- New technologies
- JV Partnership agreements
- Innovative business models
- Innovative risk models

- Cross city tunneling
- Large scale solar power
- Floating LNG

- Conventional energy
- Social infrastructure
- Commodity mining



- Metro rail
- Public Private partnerships
- Ultra-deep water/Arctic O&G

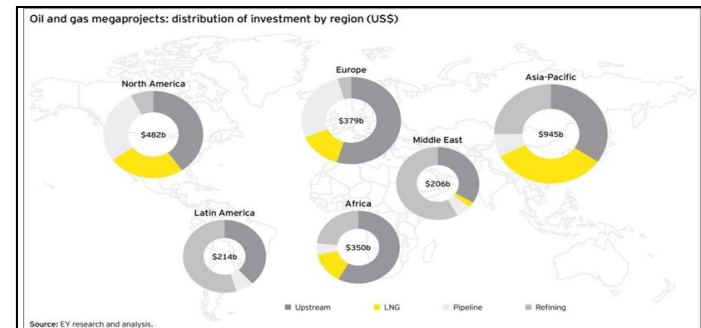
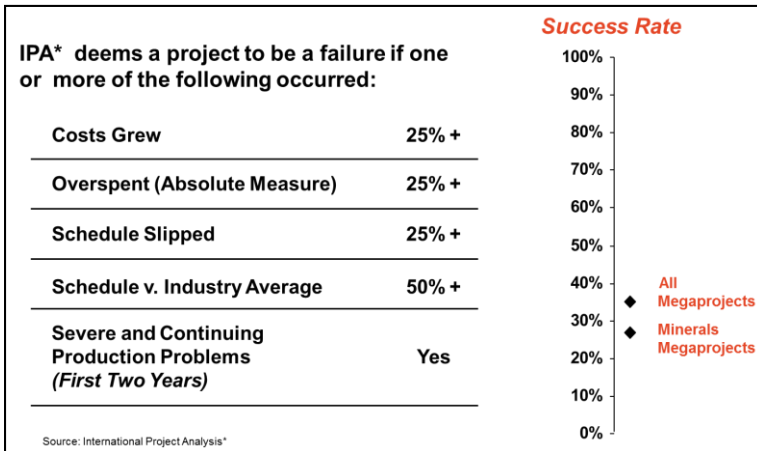
- Nuclear power
- Coal fired power
- International pipelines

External Complexity

- Global politics
- Regulatory
- Market volatility/commodity prices
- Government and public expectations
- Supply chain/operations

Source : EY Engineering & Construction report

The Performance Paradox



Upstream : LNG : Pipeline : Refining

Projects were evaluated on:
Cost : Time

The study demonstrated that cost and schedule overruns were common in **all** industry segments **and** regions.

64% of the projects are facing cost overruns
73% report schedule delays.

Source : EY/EIU Spotlight study



The Performance Paradox

The Performance Paradox :-

Many projects ... exhibit strikingly poor performance in terms of economy, environment and public support.

The average cost overrun for large-scale infrastructure projects range from 20.4% to 44.7%; and

90% of projects have cost overruns worldwide.

Source : Megaprojects and Risk: An Anatomy of Ambition

The Performance Paradox

Project	Cost overrun (%)
Boston's artery/tunnel project	196
Humber Bridge, UK	175
Boston-Washington-New York rail	130
Great Belt rail tunnel, Denmark	110
A6 Motorway, UK	100
Shinkansen Joetsu rail line, Japan	100
Washington metro, USA	85
Channel tunnel, UK/France	80
Karlsruhe-Bretten light rail, Germany	80
Mexico City metro	60
Paris-Auber-Nanterre rail line, France	60
Tyne & Wear metro, UK	55

Source : Megaprojects and Risk: An Anatomy of Ambition

The Performance Paradox

- In 9 out of 10 transport projects costs are under-estimated resulting in cost over-runs
- For rail, actual costs are on average 45% > than estimated
- For fixed link (tunnels/bridges), actual costs are on average 34% > than estimated
- For roads, actual costs are on average 20% > than estimated
- Over all project types costs are on average 28% > than estimated

Cost under-estimation is common across 20 nations; 5 continents – it is a global phenomenon

Source : Megaprojects and Risk: An Anatomy of Ambition

Some Common Causes of Project Failure

Poor performance cannot always be explained by error

Optimism Bias –

the systematic propensity of decision-makers to be over-optimistic about outcomes of planned actions;

Source : Megaprojects and Risk: An Anatomy of Ambition

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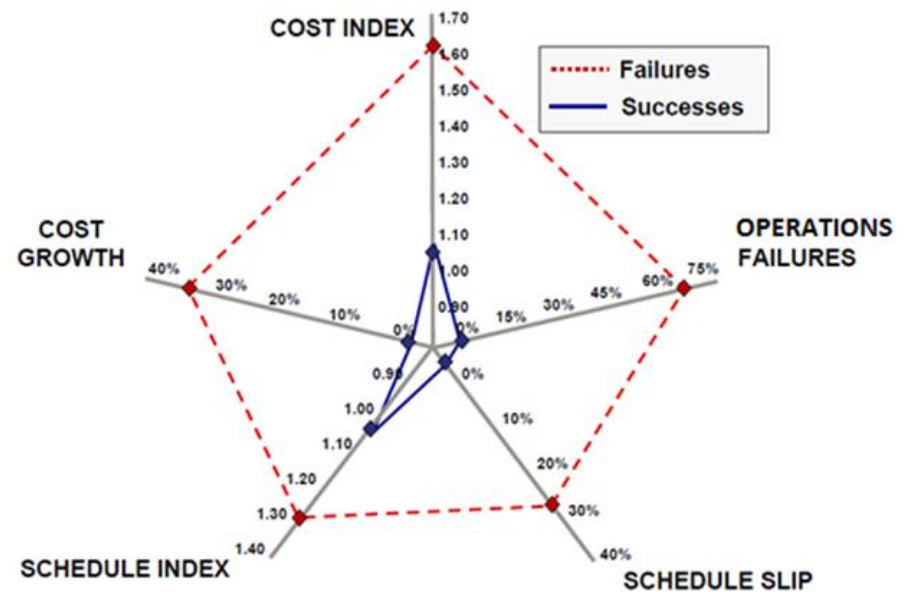
Strategic Misrepresentation –

misleading actions used by politicians, planners and/or other decision-makers to ensure that preferred projects proceed.

Source : Megaprojects and Risk: An Anatomy of Ambition

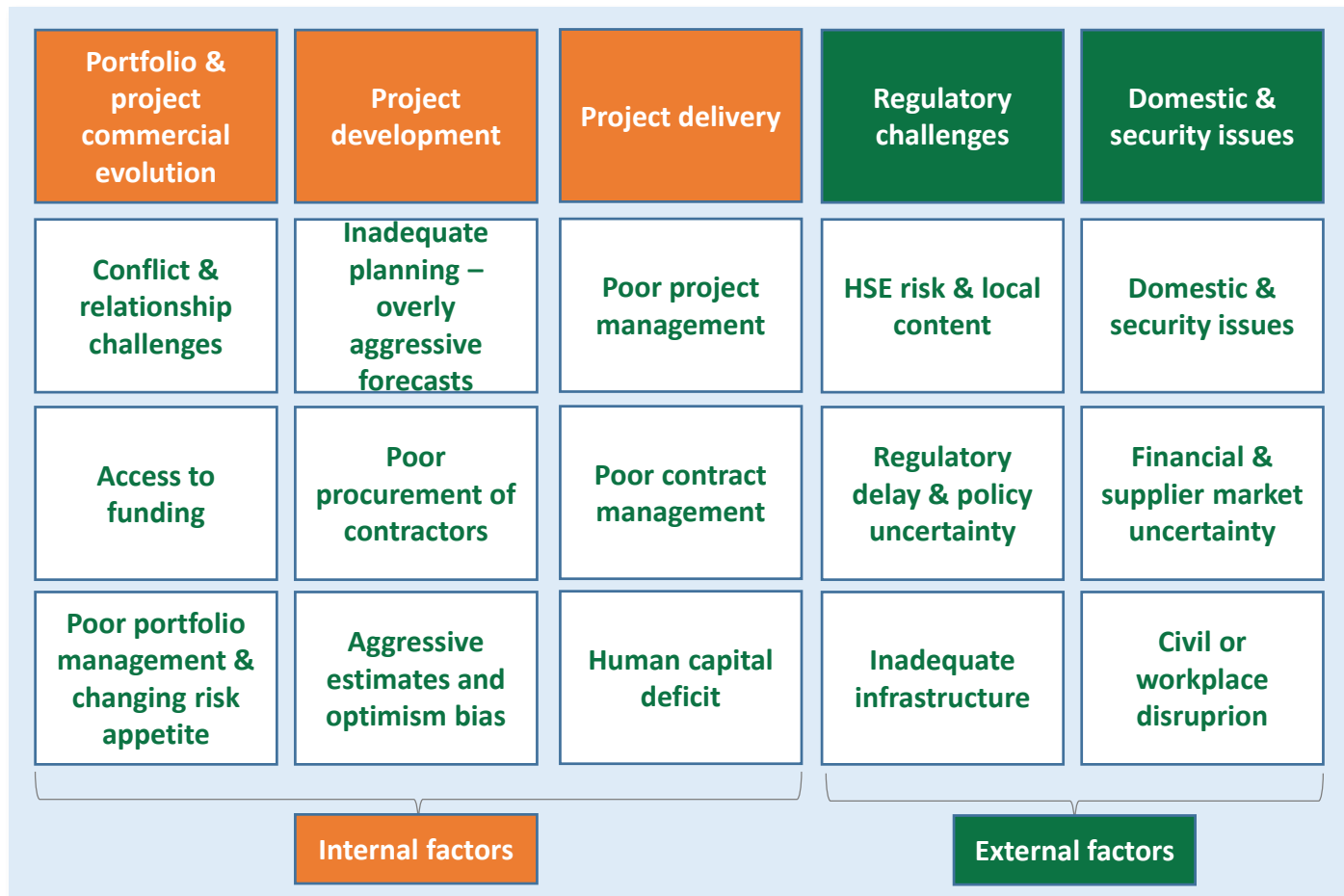
In many cases however causes of failure are more banal

- The business objectives and the priorities amongst objectives were not clear
- The teams were not properly set up or integrated
- Early stage scoping and alignment was poor

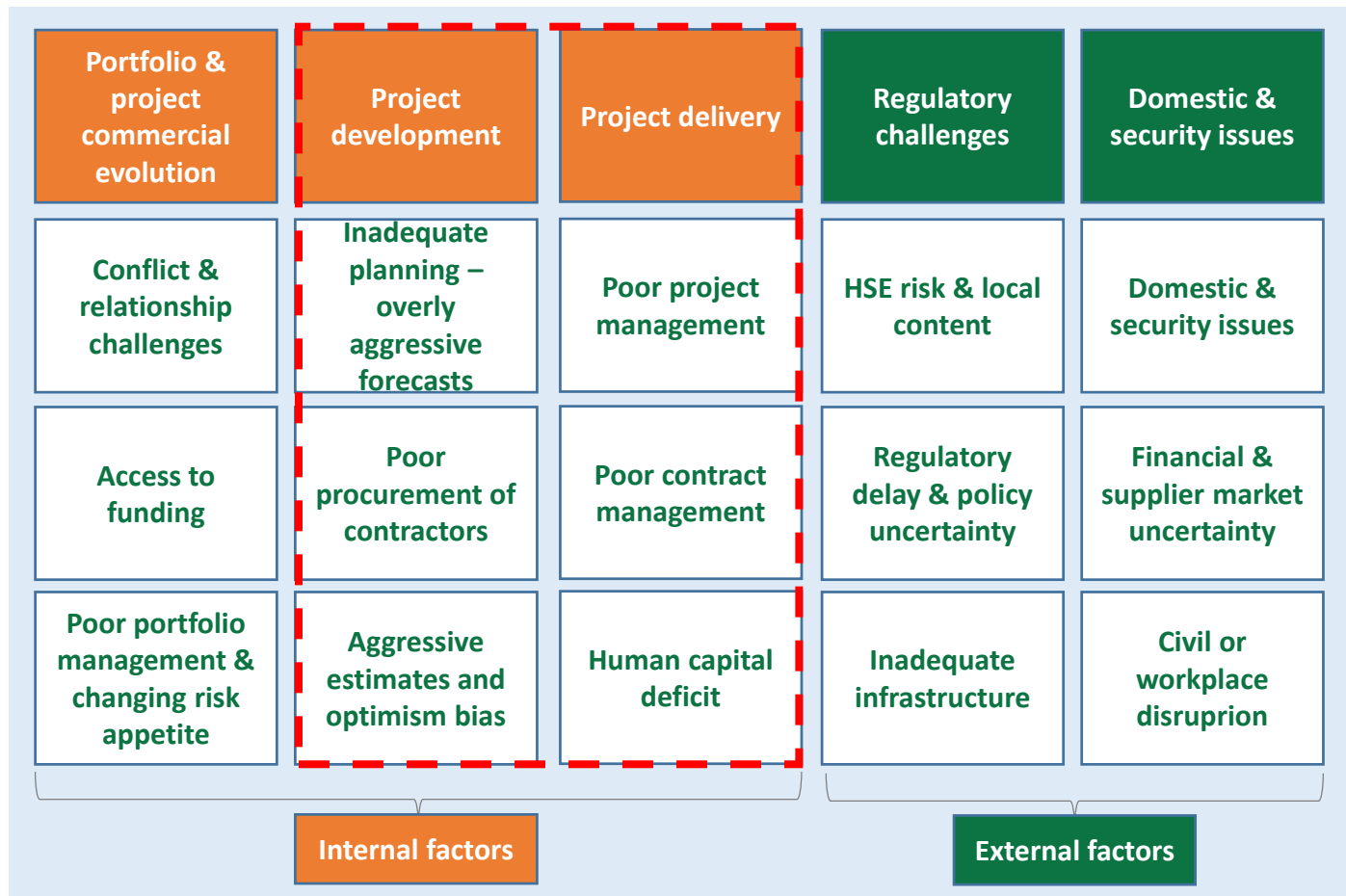


Source: IPA

Broadly speaking there are 5 categories of failure....



Of these, 2 are in the sphere of control of contractors



Typical symptoms of a failing project

Symptoms of a failed or failing project

(Schedule slippage; Quality problems; Budget over-runs; Products that don't deliver the business need; High staff turnover)



Drivers & contributing factors

Trigger events

Individual actions/inaction; mistakes; regulatory action

Behaviour

Silo working; lack of alignment about outcomes; poor discipline

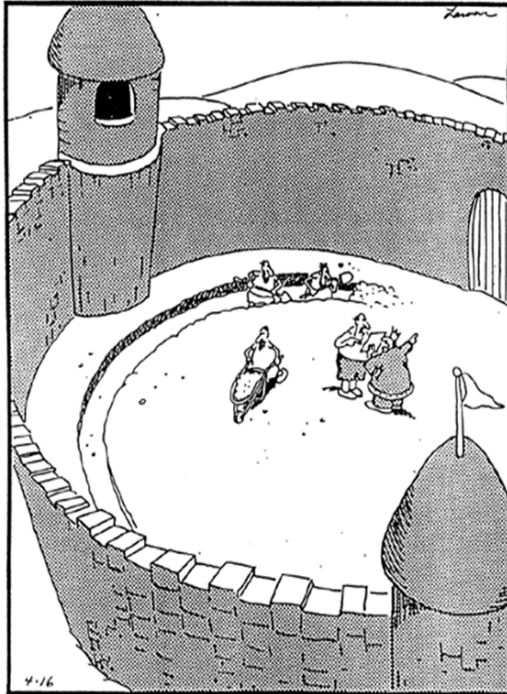


Poor or ineffectual decision-making

The basic element from which failure arises

(Inappropriate skills; poor training; inexperience; bias; internal politics; lack of trust or openness; misaligned goals; communications problems; corporate culture)

..... Of course there other reasons



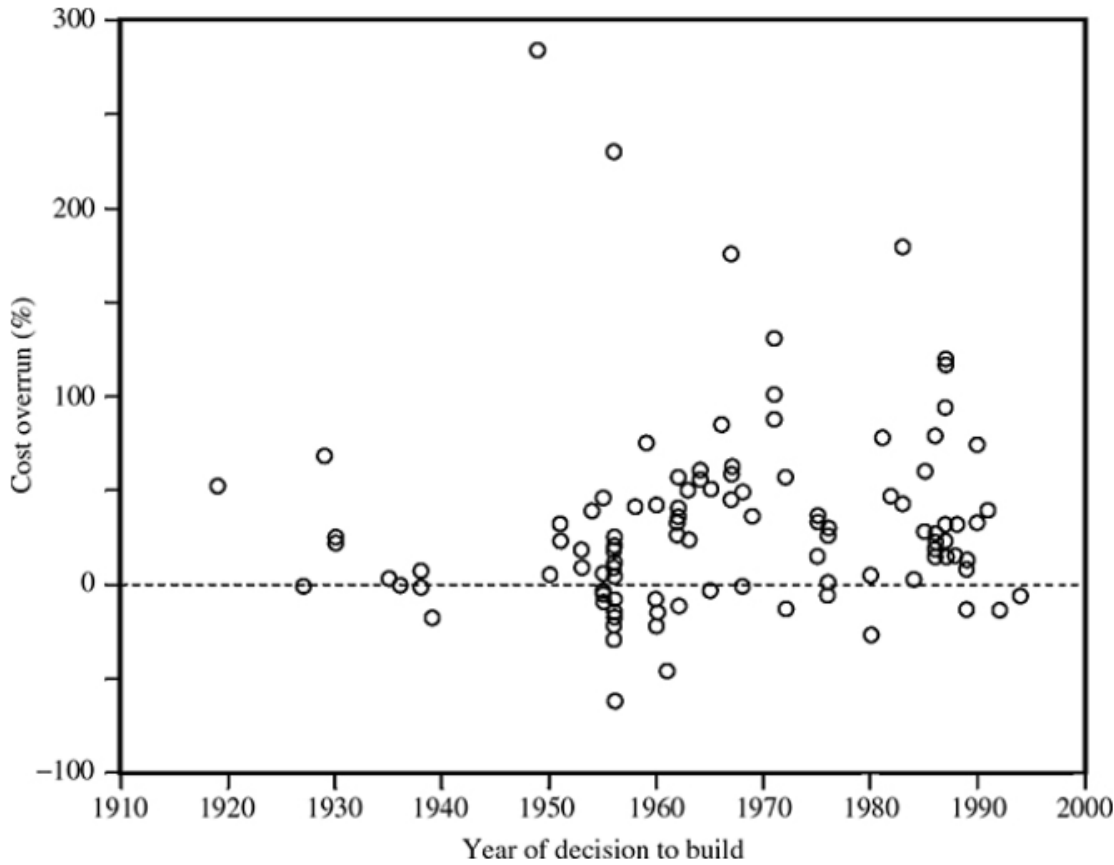
“Suddenly a heated debate took place between the King and the moat contractor”

The key distinguishing feature (of megaprojects) is not that they are big and complex, It is that they require extraordinary levels of cooperation from many parts of the organisation to achieve success. Deep cooperation is very often the missing key ingredient in megaproject development and delivery

Ed Merrow: CEO International Project Analysis (IPA)

Conclusions and Observations

Today's projects are big and getting bigger .. and more challenging ... or are they?



This is a plot of 111 major projects for which data is available, adjusted to reflect constant prices.

Source : *Megaprojects and Risk: An Anatomy of Ambition*

Some of the world's most iconic projects would not be considered successful if judged purely on cost performance.



One of the world's most important shipping routes. An average of 50 ships pass through its waters every day. Shipping tolls earn Egypt around \$5 billion annually

Adds \$775 million to the Australian economy every year and is our most distinctive national brand



"Everything that can be counted does not necessarily count; everything that counts cannot necessarily be counted." – **Albert Einstein**

Successful project organisations focus on 8 key criteria ...



Thank You

“Planning is an unnatural process; it is much more fun to do something. The nicest thing about not planning is that failure comes as a complete surprise, rather than being preceded by a period of worry and depression”.

Sir John Harvey-Jones MBE
Chairman, ICI 1982-87