Brazil O&G @2030

1. vision of oil ang gas industry in Brazil @ 2030
2. 10 key challenges

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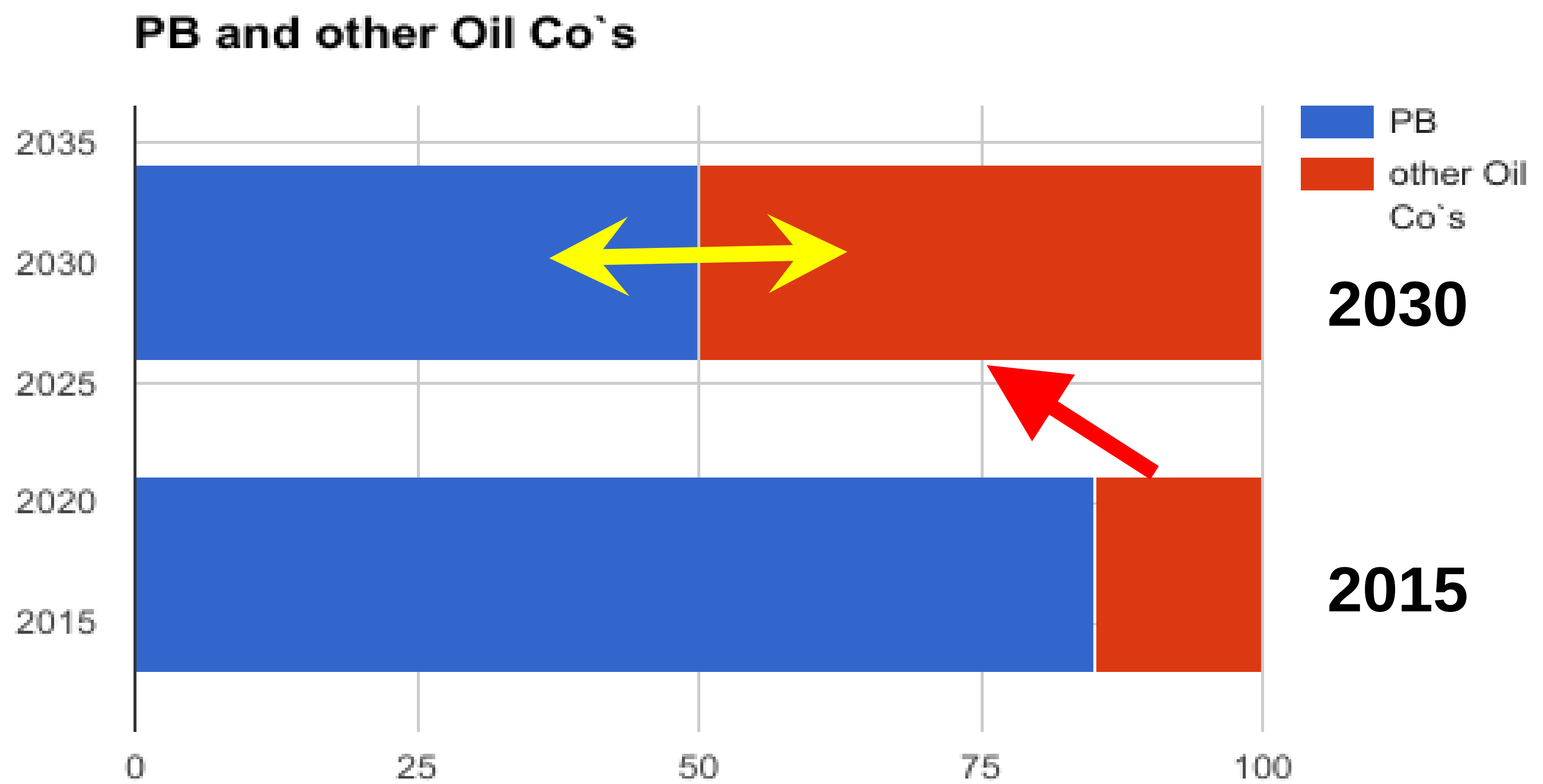
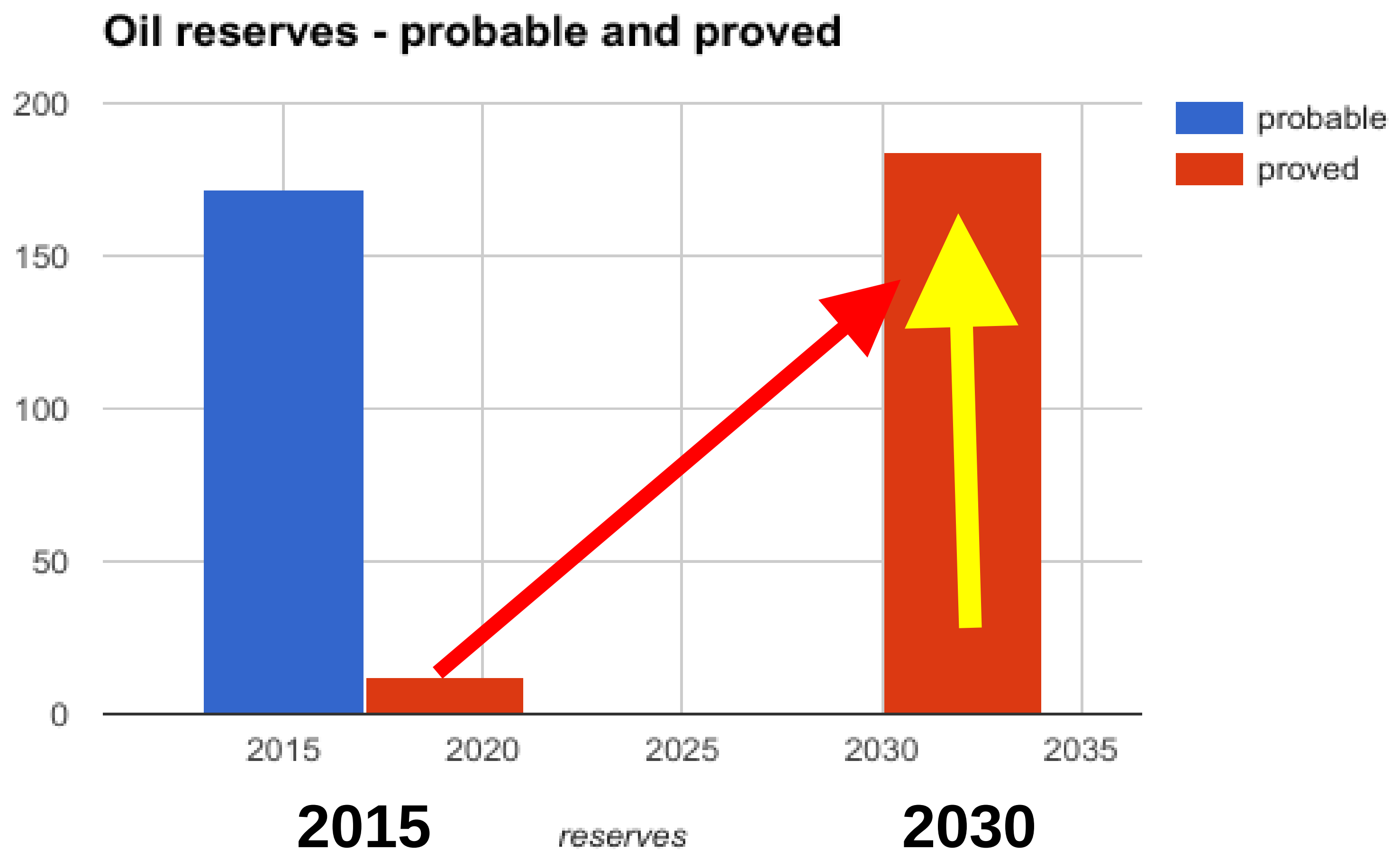
Production market share

2030



A - Oil production - market share
obs: “We do not know if can be 50%, but for sure will not stay at 85%”
2015 oil production of 2.5 million b/ day, 2030 may be 4?

Oil reserves



B- Brazil Oil reserves
2015: Proved: 13 bi bbl   probable: 172 bi bbl (presalt)
2030: Proved: 13 + 172 bi bbl???

Bid rounds

Today

Intermittent

Restricted areas

Environmental licenses driven

2030

Environment menu

Continuous opening for business

Petrobras roles

Stronger supplier market makes more “natural” local content; many operators and many providers

4

2030

Other O&G companies

Factor 1: Quantity of O&G operators

Other O&G companies are coming

Petrobras
2017 - Focus on the support of market weaknesses and being industrialization arm

U$ 6 billion?

? ?

Petrobras
2030 - Focus on reservoirs, performance

Factor 2:
Spare parts, Inventories
Personnel Qualification
Maintenance
Operations support
Etc. for goods and services

Interrupted supplies processes, if one wins the others are out, no continuous competence

Becoming similar to US Gulf and UK North sea

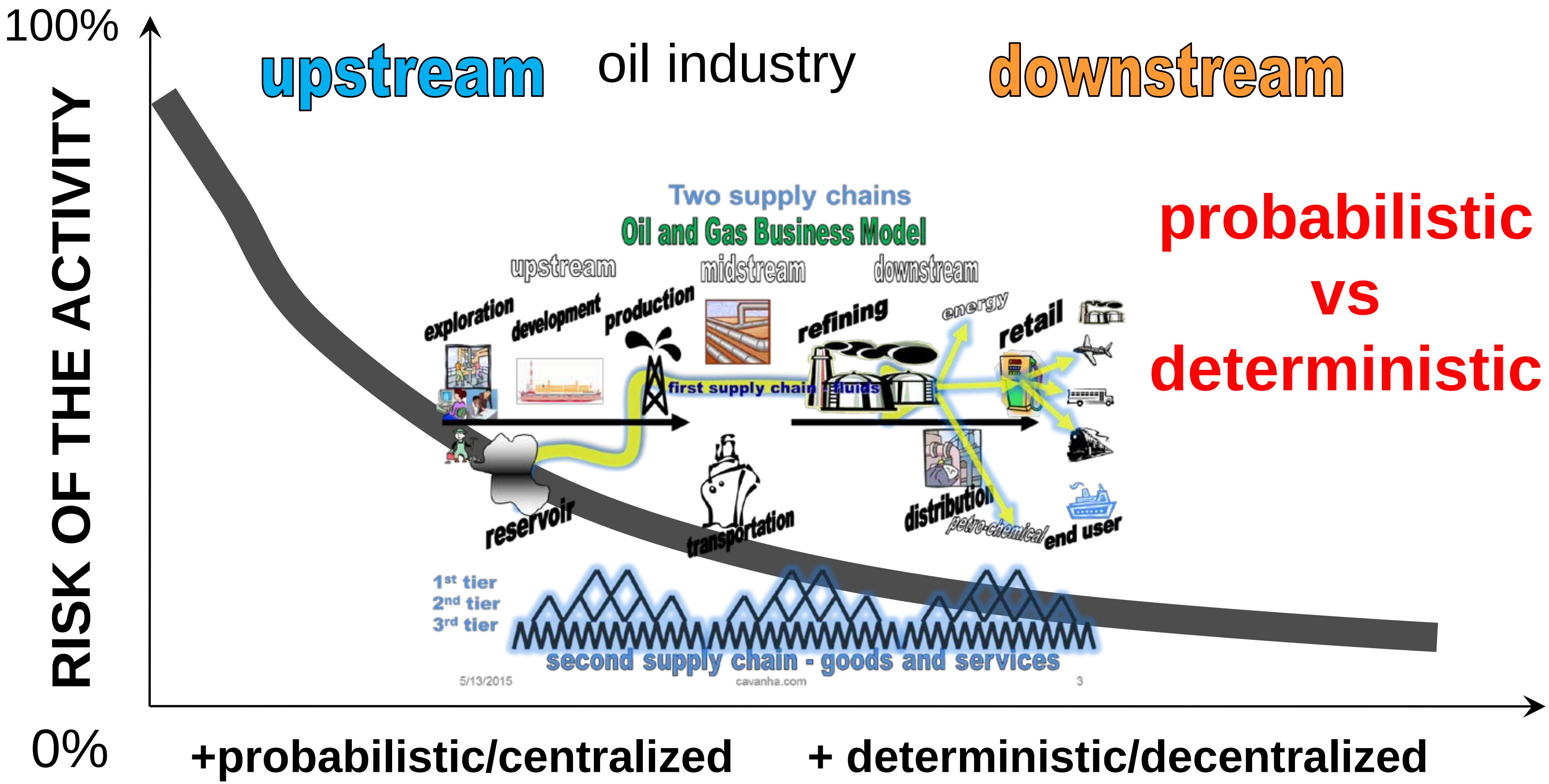
Buffer layer, distributors, reducing times and inventories

Specialized market strength, customer diversification, partnerships, dependent on performance - who does local content is the huge supplier market

5

Upstream vs downstream

2030



Upstream is Nomad, Associative, Technological, Opportunity
Contracts follow Contingency, Resilience

Downstream is Sedentary, Optimization, Chronogram, Planning
Contracts follow Redundancy, Robustness

Local content

Who does what?

6 1/2

Local content competence

1st tier

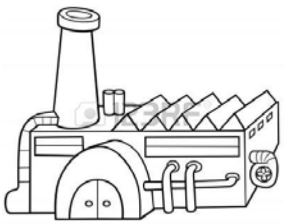
Machines that make machines

Systems, equipment, parts

Components
Raw material

fmc, cameron, technip, oderbretch, shulumberger, halliburton, baker...

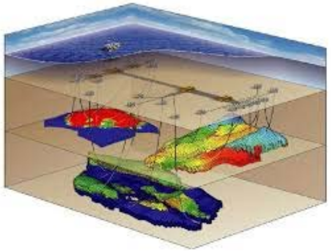
construction



manufacturing

Service providing

Local content commitment only in this interface? Should expand to a Industrial Policy



operator

petrobras, shell, exxon, chevron, total, repsol...

Investor

Agência Nacional do Petróleo

2030

$

6 2/2 Local content

O&G companies make free choices and partnerships among them and with providers to increase competitive local content, including export for foreign fields.
Should be better with tax reductions and processes simplification at risk time.

Operation of production

Exploration

Development of production

fases

The amount of local activities incorporated at the previous phases increases taxation, jobs, etc. As a consequence, Royalties and production taxation should be reduced proportionally.

"Basic Engineering", R&D, Local Content

2030

Should be local, or in partnership with locals

Its the time the company chooses tech options

processes

reservoir

equipment

geology
geophysics

systems

reservoir

FEL 1 FEL 2 FEL 3

Engineering providers

Exploration and reservoir delimitation	Conceptual engineering FEL1	Basic engineering FEL2	Detailing engineering	EPC – engineering procurement construction	Operation of production (20 to 30 years)

O&G companies

O&G companies

Systemic knowledge domain

selection of technologies, systems, equipment, vendor list, budgets, mass and energy balances, etc.

Strong Local content depends on a consistent and competent Basic Engineering

What market availability, technologies, suppliers an engineer working with basic engineering located in Singapore, Tokyo or Houston can see or select? Can he develop local suppliers?

8

Procurement strategies

Contracting by technological and commercial partnerships balance the market and encourage local content

Procurement differences

2030

high

Marketplace complexity

Long-term contracts, consortiums, central coordination	**Partnerships vertical integration, supplier development**
Outsourcing, standardization, catalogs, automation	**Short-term contracts, substitution consolidation**

Item Criticality high

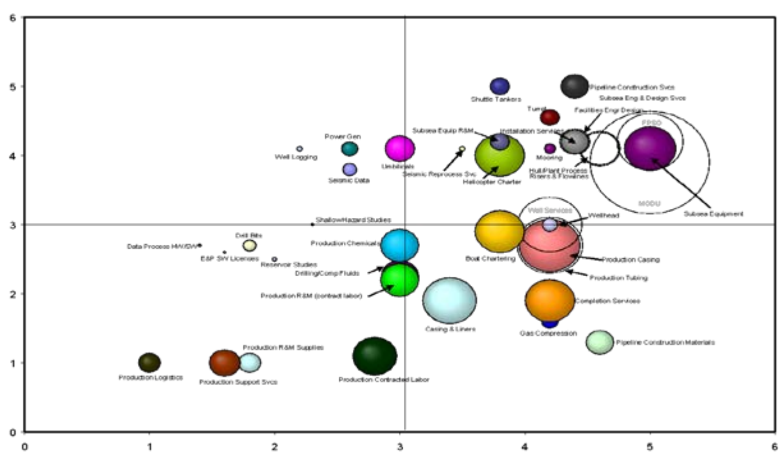
1st level

logistics partnership and inspection Petrobras tubes - Vallourec

2nd level

collaborative development partnership in well completion Shell-FMC

3rd level



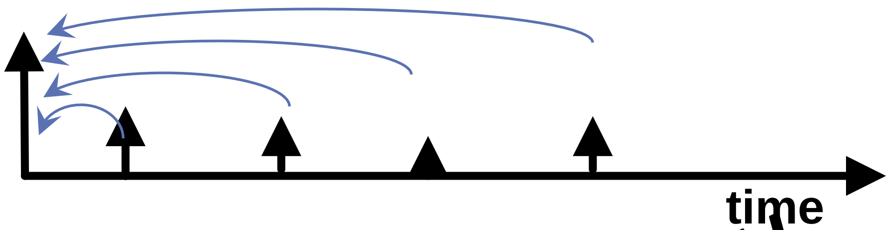
TCO

9

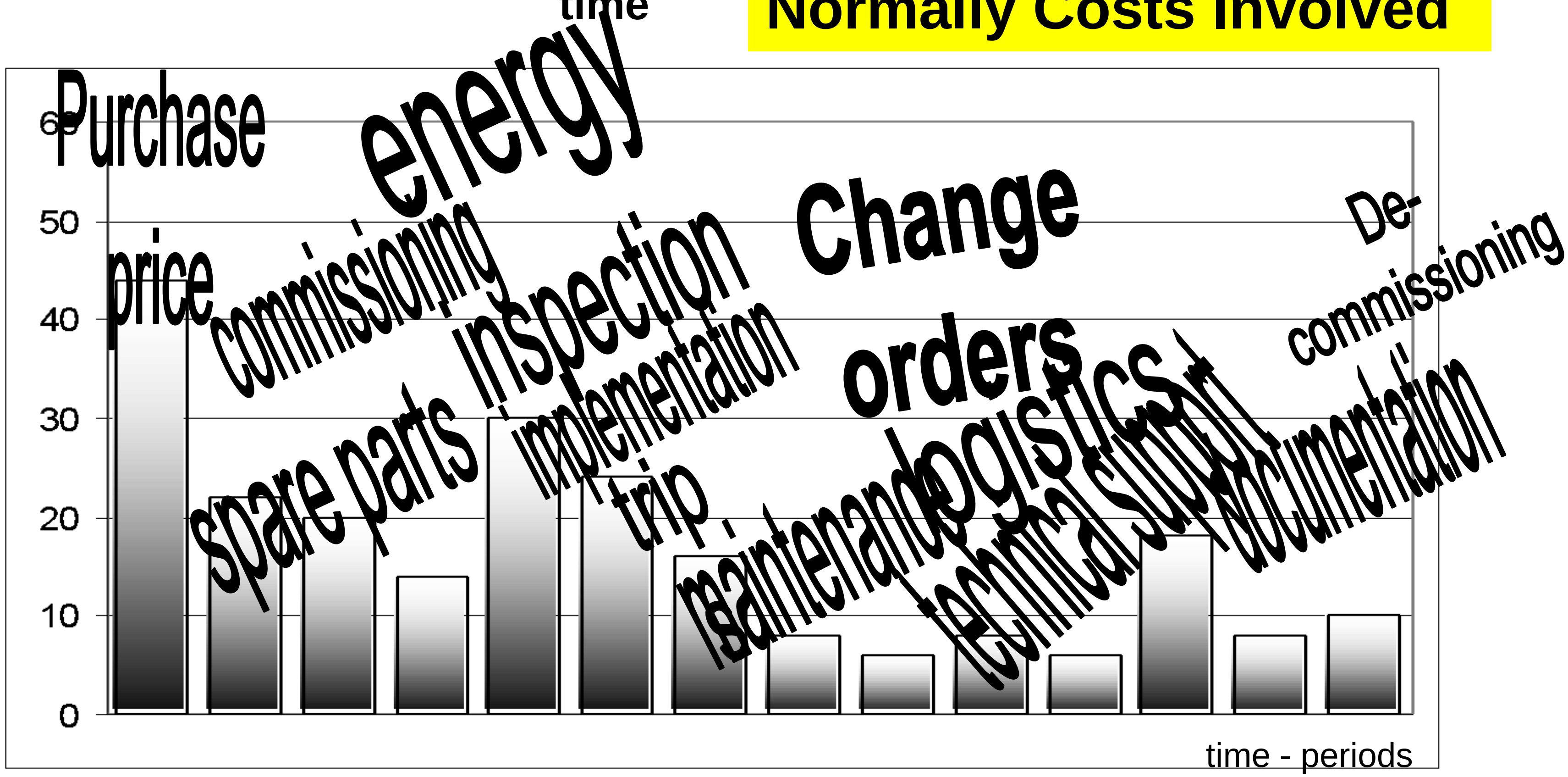
Decisions taken at time zero based on future costs

Total cost of ownership

2030

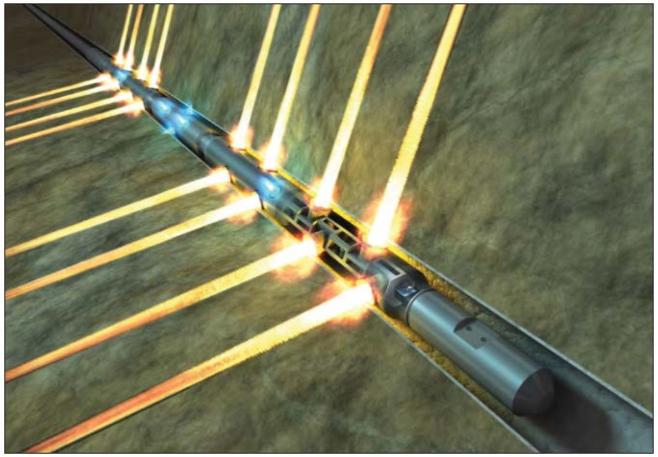


Normally Costs Involved



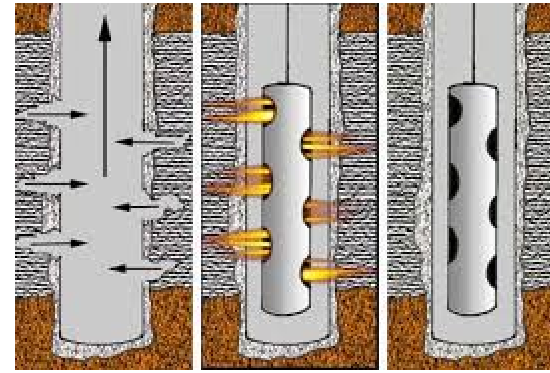
10

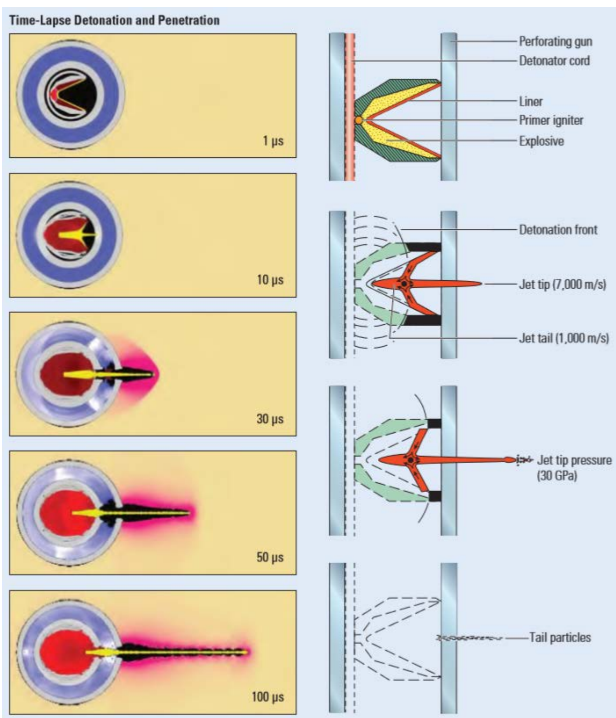
Research peer to peer

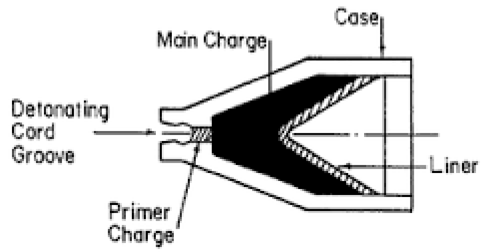


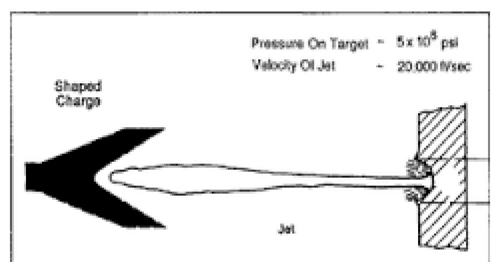
API RP43
Berea sandstone
Shaped charge

lose adherence due to lack of continuous operational research









proposal: huge partnerships with worldwide research centers to focus on long term operational research

Thank you!

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