Brazil O&G @2030

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

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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?
B- Brazil Oil reserves

2015: Proved: 13 bi bbl  probable: 172 bi bbl (presalt)

2030: Proved: 13 + 172 bi bbl???
<table>
<thead>
<tr>
<th>Today</th>
<th>2030</th>
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</thead>
<tbody>
<tr>
<td>Intermittent</td>
<td>Environment menu</td>
</tr>
<tr>
<td>Restricted areas</td>
<td>Continuous opening for business</td>
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<tr>
<td>Environmental licenses driven</td>
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</table>
Factor 1: Quantity of O&G operators

Other O&G companies are coming

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

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

U$ 6 billion?

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

Becoming similar to US Gulf and UK North sea

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

Buffer layer, distributors, reducing times and inventories

Petrobras 2030 - Focus on reservoirs, performance

Other O&G companies

Petrobras

2030

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

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

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

2030 - Focus on reservoirs, performance

Other O&G companies

Petrobras roles

### Petrobras

- **2017 - Focus on the support of market weaknesses and being industrialization arm**
- **U$ 6 billion?**

### Other O&G companies

- **Quantity of O&G operators**
- **Spare parts, Inventories Personnel Qualification Maintenance Operations support Etc. for goods and services**

### Buffer layer, distributors, reducing times and inventories

- **Interrupted supplies processes, if one wins the others are out, no continuous competence**
- **Becoming similar to US Gulf and UK North sea**

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

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Here are the factors influencing Petrobras roles:

1. **Factor 1: Quantity of O&G operators**
   - Other O&G companies are coming

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

### 2030

- **Focus on reservoirs, performance**

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*Source: [cavanha.com]*
Upstream vs downstream

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

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

- **Probabilistic/Centralized** vs **Deterministic/Decentralized**

The diagram illustrates the risk of the activity in the oil industry with a probabilistic vs deterministic approach. The upstream segment is characterized by Nomad, Associative, Technological, Opportunity, with contracts following Contingency, Resilience. The downstream segment, on the other hand, is Sedentary, Optimization, Chronogram, Planning, with contracts following Redundancy, Robustness.
Local content competence

6 1/2

Machines that make machines

Systems, equipment, parts

Components

Raw material

Who does what?

1st tier

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

construction

manufacturing

operator

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

Investor

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

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.

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.
Should be local, or in partnership with locals
Its the time the company chooses tech options

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?
## Procurement strategies

Long-term contracts, consortiums, central coordination

Partnerships vertical integration, supplier development

Outsourcing, standardization, catalogs, automation

Short-term contracts, substitution consolidation

### Marketplace complexity

**High**

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

### Item Criticality

**High**

### Logistics partnership and inspection

- Petrobras tubes - Vallourec

### Collaborative development partnership in well completion

- Shell-FMC

### Selected providers

- Esterline
- Rockwell Collins
- Cobham
- Goodrich
- Safran
- LHC Colus
- Hales
- Luns
- SAAB
- Thales
- Many others...

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**cavanha.com**
Decisions taken at time zero based on future costs

Total cost of ownership

Normally Costs Involved

- Purchase price
- Commissioning
- Spare parts
- Inspection
- Implementation
- Trip
- Change
- Orders
- Maintenance and logistics
- Technical support
- Documentation

Time - periods

2030
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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