Understanding Local Opportunities in the Brazilian Petroleum Sector

HAMBURG

Carlos Soligo Camerini

September - 2014
ONIP - Brazilian National Organization of the Petroleum Industry - Members
Mission

To contribute to increase competitiveness and sustainability of the domestic industry to maximize local content and the generation of employment and income in the oil and gas sector.
CadFor - Registry System for Operators in Brazil
The objective is to increase the knowledge about local suppliers
CadFor - Objectives

- Qualified Suppliers Data
- Structured Actions for LC Solutions
- Technical Meetings with Suppliers
- Initiatives of Interaction between Buyers and Suppliers
- Support the Registration of Suppliers in CadFor at Expositions and Other Forums
Total projected Investments for projects in Brasil (2014 – 2018 in US$ billion)

<table>
<thead>
<tr>
<th>CAPEX</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Petrobras</td>
<td>220,6</td>
</tr>
<tr>
<td>Other Operators*</td>
<td>46</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>267</strong></td>
</tr>
<tr>
<td><strong>CAPEX per year</strong></td>
<td><strong>53</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OPEX per year*</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total per Year</strong></td>
<td><strong>61</strong></td>
</tr>
</tbody>
</table>

Source: Petrobras
* ONIP estimates
Demand for goods and services in the Offshore sector will reach around $370 billion by 2020. Sufficient scale to develop a robust local supply chain.
THE “BIG MONEY” IN OFFSHORE CAPEX GOES TO DRILLING AND PLATFORMS

Offshore Capex per category

- Other
- Drilling & Well services
- Installations
- Subsea Production Systems
- Fixed & Floating platforms
- FEED

USD billion

Source: IHS CERA
MULTIFOR Program PLATEC - FPSO

1 - Process Equipments
2 - Turbomachinery
3 - Mechanical equipments
4 - Electrical equipments

5 - Instrumentation and Automation

6 - Pipes and valves
7 - Industrial safety
8 - Telecommunications
9 - Ventilation and air conditioning
10 - Power Generation
11 - Utilities and facilities

Supervisory software
Software control setting type "PID"
Programmable logic controllers - PLCs
Integrated systems - HMI interfaces and controllers
Detection and monitoring of leakage
Integrators load monitoring system
Flowmeters
System integrators for measuring gas and crude oil
System for monitoring machine
MULTIFOR Program
Air Compressor

Increasing Local Content

- Drilling Rigs (Onshore & Offshore);
- FPSO;
- Supply Boats;
- Subsea Special Equipments

DETAILS

423 – total components
280 – could be nationalized
Pre-Salt

149,000 Km², high rates of CO₂ and H₂S, high production volumes and high pressures (TUPI – 9,000 psi).
More than 100 challenges identified for ultra deep waters - Drivers for R&D&I

1. **Seismic**: increase resolution and data processing capacity;

2. **Subsea well containment, oil spill, remediation and response**: Macondo learned lessons;

3. **Reservoir**: Higher chance of overall economic success, lower uncertainties and water management;

4. **Drilling**: Generation of better geological and geophysical information, HPHT, reduce drilling and completion time, simplify wellbore and enhance reliability, MPD, MCD and UBD;

5. **Wireline**: less need to use, lighter and riserless;

Source: ONIP consolidation from: oil companies business plans, NPC studies, certification companies articles and news.
More than 100 challenges identified for ultra deep waters - Drivers for R&D&I

6. **Completion**: more reliable, flexible and efficient, integration with subsurface, subsea and host facility, intelligent completion;

7. **Subsea Extended Architecture**: Flow assurance driven, extensive use of seabed, removal of the host facility and subsea power generation and distribution;

8. **Flow assurance**: manage back pressure, hydrates, wax formation and asphaltenes, heavy oil still a problem for some companies;

9. **EOR**: more reliable, effective and economically feasible;

10. **FPU facilities**: least footprint, low CAPEX;

11. **Maintenance and on-service inspection**: flow assurance, environmental issues, assets integrity (flexible flowlines and risers).

*ONIP consolidation from: oil companies business plans, NPC studies, certification companies articles and news.*
Focus on Brazil Pre-Salt Challenges – Ultra Deep Waters

- Developments - 2012/2013
  - Subsea separation Oil/Water;
  - 4D permanent seismic monitoring - partial - there are still challenges for UDW - Jubarte;
  - Subsea Water Injection - tested in Albacora;
  - Flexible Riser with buoyancy system and Flowlines – 2,200m;
  - Subsea Multiphase Pumping - tested in Barracuda;
  - Drilling horizontal wells through salt (second well high angle – Oct, 2013).

Source: ANP.
WHY NOT?
Looking into the Future

Riserless Drilling
Looking into the Future

Laser Drilling
Looking into the Future

Submarine Processing
Looking into the Future

Submarine Electric Distribution
Looking into the Future

New Generation of Production Equipments
Looking into the Future

FPSO of the Future
UDW Pre-Salt Challenges - 2030

- New materials - extreme condition/engineering - non stick coatings, carbon fiber and anti-corrosion coatings, steel substitution (composites);

- Subsea power generation – 50MW or more;

Source: ONIP consolidation from: oil companies business plans, NPC studies, certification companies articles and news.
Rio de Janeiro you’ve already heard about...
and the Rio de Janeiro you should also know ...
Other Companies with development plans for technological centers in Brazil:

- Cameron
- IBM
- Technip
- Weatherford
- Wellstream
The P-ZZ\(^{(1)}\) vendor list indicates the national chain growth potential – about 40% of the equipment groups have not been considered local suppliers.

### Supply of equipment and Systems

<table>
<thead>
<tr>
<th>Number of Companies</th>
<th>Number of Groups</th>
<th>Suppliers</th>
<th>% Estimated Value</th>
<th>Type of Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>286</td>
<td>112</td>
<td>38%</td>
<td>Only Foreign Companies</td>
</tr>
<tr>
<td>Other countries</td>
<td>111</td>
<td>38%</td>
<td>Predominance of Foreign Companies</td>
<td>48-52%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>37%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>18%</td>
<td>Predominance of National Companies</td>
<td>3-5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7%</td>
<td>Only National Companies</td>
<td>1-2%</td>
</tr>
</tbody>
</table>

1) Recent platform
Source: Booz & Company Analysis
The importance of Local Content policies

Energy Minister wants to see more UK local content

Charles Hendry says government is 'not neutral' on content issues and wants to see UK companies get their share of new work

Iain Easa
Aberdeen

UK Energy Minister Charles Hendry says the UK government is ‘not neutral’ on local content issues and he wants domestic companies to pick up the bulk of work on offer in a rash of upcoming projects.

The minister, speaking at an SPE Offshore Europe plenary session on Tuesday, said that 2011 ‘seems to be shaping up to be our best year for new developments in at least a decade, on a par with some of the very early years of the industry’.

He said the Department of Energy & Climate Change (DECC) is tracking a number of significant projects going forward, pointing out that he is ‘keen to see some of the substantial value of these developments coming to the UK’.

Hendry stressed that the government is ‘not neutral’ on this issue, stating: ‘We want to see those jobs in the supply chain coming to UK companies.’

Hendry did not demand that operators allocate work to UK companies but instead wanted to encourage oil companies to award contracts locally.

‘I would encourage all the operators to seriously consider this UK capability. And if they decide not to do so, I would like to know why, so we can make a better case for the expertise in the UK supply chain in the future,’ Hendry said.

On taxation, Hendry understood the industry’s ire over the 2011 budget tax hike but said even this could have a silver lining with the government’s Treasury Department keen on a ‘rapprochement of sorts’.

‘If there is a benefit from the subsequent discussions that have taken place between industry and government, it is the very clear recognition of the need for dialogue between industry and my Treasury colleagues about the economics of the UK oil and gas business, the scope for allowances, the handling of decommissioning and so on,’ said Hendry.

He pointed out that Justine Greening, Economic Secretary at the Treasury Department, who will visit Offshore Europe on 8 September, has agreed to the formation of a working group, under the auspices of the Pilot programme, to focus on fiscal issues.

This group will enable “ongoing dialogue” between industry and government “about the context in which oil and gas projects are proposed in the future”.

Hendry added that both the DECC and the Treasury “want to see this lead to a much closer working relationship” with industry.

Source: UPSTREAM, September 7th, 2011
### Projected Investments - 2014 / 2017

**Selected sectors (R$ billion)**

<table>
<thead>
<tr>
<th>Sector</th>
<th>Amount</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil &amp; Gas</td>
<td>458</td>
<td>42%</td>
</tr>
<tr>
<td>Mining &amp; Quarrying</td>
<td>48</td>
<td>4%</td>
</tr>
<tr>
<td>Automotive</td>
<td>74</td>
<td>7%</td>
</tr>
<tr>
<td>Paper &amp; Cellulose</td>
<td>19</td>
<td>2%</td>
</tr>
<tr>
<td>Petrochemical</td>
<td>25</td>
<td>2%</td>
</tr>
<tr>
<td>Steel</td>
<td>10</td>
<td>1%</td>
</tr>
<tr>
<td>Electronics</td>
<td>26</td>
<td>2%</td>
</tr>
<tr>
<td>Health</td>
<td>13</td>
<td>1%</td>
</tr>
<tr>
<td>Aerospace</td>
<td>9</td>
<td>1%</td>
</tr>
<tr>
<td>Others</td>
<td>418</td>
<td>38%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,100</td>
<td></td>
</tr>
</tbody>
</table>

*Fonte: BNDES*
Local Content - The offshore supply chain is quite broad, covering a large number of segments.

1 Includes all materials and equipment for which the offshore chain is unrepresentative, thus staying out of the main supply chain.
Conclusions

• The petroleum sector is crucial for Brasil's economical development;
• The country is one of the most dynamic markets in the world today;
• Opportunities cover all business sectors;
• The size of CAPEX is getting all the attention but OPEX is already very attractive and will grow along time;
• The presence of a solid industrial base in Brasil should be considered local content could be an ally rather than an obstacle;
• Offshore architecture will change; new technologies, new challenges and new opportunities;
• Aggregating local content whenever possible is always a good strategy;
Thank you