PPSA’s roles and activities in the Brazilian pre-salt

Approach to Norwegian Institutions and Industry

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Outline

• The Brazilian pre-salt and its regulatory regimes
• PPSA’s roles and current activities
• Research, technology and innovation opportunities
• Closing remarks
The Brazilian pre-salt and its regulatory regimes
2000 - 2nd ANP Bid Round in the pre-salt

2005 - 1st discovery in Santos Basin pre-salt

2006 – Oil discovery confirmed in Tupi prospect

2007 – Announcement of huge pre-salt resources

2008 – 1st oil in Campos Basin pre-salt (Jubarte)

2009 – 1st oil produced in Santos Basin pre-salt (Lula)

2010 – Pre-salt Production Sharing Regime and PPSA

2011 - Oil discovery in Libra Prospect

2013, August – Founding of PPSA

2013, November – 1st PSA Bid Round in the pre-salt area

2014, June – Petrobras granted the surplus of the transfer of rights area

Expected ~US$ 100 billion investment until 2019*

100% exploratory success in the pre-salt area in 2013*

896 Kboe/day reached in May/2015**

11 production units and 49 production wells **

*Source: Petrobras  
**Source: ANP
Regulatory Regimes Governing E&P Activities In Brazil

### Concession Regime
- 1997 - Law 9.478
- Bid rounds for licensing
- No mandatory state participation
- Oil production belongs to concessionaires

### Regime of Transfer of Rights to Petrobras
- 2010 - Law 12.276
- Licenses granted directly to PETROBRAS
- Capitalization of PETROBRAS with direct transfer of rights to produce 5 billion barrels of O&G

### Production Sharing Regime
- 2010 - Law 12.304 and Law 12.351
- For areas not granted to concession in the Pre-Salt Polygon
Pre-Salt Polygon
Area: 149,000 Km²

Concession Area:
42,000 Km² (28%)

Transfer of Rights
Area: 3,740 Km² (2.5%)

Production Sharing
Regime – Libra:
1,548 Km² (1%)

Santos Basin

Campos Basin

Estimated Volume in Place
(Sep 2014)
200 billion boe

Estimated Reserves
(Sep 2014)
37-46 billion boe
Production Sharing Regime

- Production Sharing Agreement (PSA)
  - License granted directly to Petrobras
  - License granted to a consortium through bid round

- PETROBRAS: sole operator with at least 30% participation
- Non-operators: consortium partners
- PPSA: consortium member representing the State’s interests in the PSA
- ANP: manages the bid rounds and regulate the PSA
Production Shares in the PSA

- **Hydrocarbons Total Production**
- **Royalties**
- **Profit Oil**
- **Cost Oil**

**Social Fund (Education and Health)**

**State Share of Profit Oil**
PPSA’s roles and current activities
Pre-Sal Petróleo S.A. (PPSA)

Roles
• Management of:
  ✓ Production Sharing Agreements; and
  ✓ Commercialization Agreements
• Representation of the State in Unitization Agreements

Goal
• Maximization of the economic results of:
  ✓ PSA’s; and
  ✓ Commercialization of the State O&G

Main Assignments in PSA’s
• Consortium Operational Committee
  ✓ Chair with 50% vote and veto power
• E&P plans and execution
  ✓ Management and audit
  ✓ Technical and economic analysis
  ✓ CAPEX & OPEX monitoring and audit
  ✓ Sanction of qualified expenditures (cost oil recovery)
• Local Content
  ✓ Targets accomplishment assurance
First PSA: Libra

Bid Round in Oct 21, 2013
Signature Bonus: R$ 15 billion

**Winner Consortium:**
- Petrobras (Operator) .... 40%
- Shell Brazil ..................... 20%
- Total Brazil ..................... 20%
- CNODC Brazil ................. 10%
- CNOOC Brazil ................. 10%

**Signing of PSA:** Dec 02, 2013

**Government Share in Profit Oil:** 41.65%
(for US$ 100/bbl and 12,000 bbl/day)

**Percentage of Cost Recovery:**
- 50% in the first two years and 30% thereafter

**Oil Discovery:**
Well 2-ANP-2A – RJS
API 27°; GOR 410-450 m³/m³; CO2 40-42%
High productivity: 3667 bopd (choke 32/64”)

**Estimated Resources:** 8 to 12 billion boe(*)

(*) Source: ANP

Major Challenge:
Fast-track development vs. Local Content requirements
### Transfer of Rights to Petrobras (Contracted volumes in 2010)

<table>
<thead>
<tr>
<th>Areas</th>
<th>Volumes Billion boe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buzios</td>
<td>3.058</td>
</tr>
<tr>
<td>Iara Surrounding</td>
<td>0.600</td>
</tr>
<tr>
<td>Florim</td>
<td>0.467</td>
</tr>
<tr>
<td>NE Tupi</td>
<td>0.428</td>
</tr>
<tr>
<td>S Lula</td>
<td>0.128</td>
</tr>
<tr>
<td>S Guara</td>
<td>0.319</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>5.000</strong></td>
</tr>
</tbody>
</table>

### PSA’s directly granted to Petrobras for surplus volumes

<table>
<thead>
<tr>
<th>Areas</th>
<th>Surplus Volumes Billion boe (*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buzios (Franco)</td>
<td>6.5 to 10.0</td>
</tr>
<tr>
<td>Iara Surrounding</td>
<td>2.5 to 4.0</td>
</tr>
<tr>
<td>Itapu (Florim)</td>
<td>0.3 to 0.5</td>
</tr>
<tr>
<td>Sépia (NE Tupi)</td>
<td>0.5 to 0.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>9.8 to 15.2</strong></td>
</tr>
</tbody>
</table>

- **Signature bonus:** R$ 2 billion
- **35 years contract**

(*) ANP estimate

### Additional Information

- Very large potential resources with low risk
- Several wells already drilled in the four areas totaling 2,046 km²
- Declaration of Commerciality already submitted
- Pending PSA, depending on renegotiation of Transfer of Rights terms

Allows for project optimization
Avoids juridical uncertainties
More than double reserves under PSA’s agreements (18-26 billion boe)
Representing the State in Unitization Agreements

- **Santos Basin:**
  - Lula & Sul de Lula
  - Sapinhoá
  - Sul de Sapinhoá
  - Gato do Mato
  - Carcará
  - Epitonium

- **Campos Basin:**
  - Tartaruga Mestiça
  - Pirambu
  - Carapeba
  - Nautilus
  - Caxaréu
  - BMC-32

Cases of petroleum discoveries where reservoirs extend over non-contracted areas in the Pre-Salt Polygon. Unitization Agreements will allow for monetization of the State’s O&G sooner than PSA’s.
Commercialization of the State’s Petroleum and Natural Gas

- PPSA shall not commercialize directly or indirectly the State’s O&G but shall manage the commercialization contract with a trading agent, and monitor and audit the operations.

- PPSA transfers title of the State’s petroleum and natural gas directly to the final buyer.

**PPSA role**
- Contract the trading agent
- Manage the commercialization agreement with the trading agent
- Monitor and audit trading agent decisions
- Control the State volumes and lifting procedures
- Deposit the income on social fund
- Evaluate the performance of the trading agent

**Trading agent role**
- Trade the oil & gas
- Provide documents and certificates necessary for lifting
- Evaluate credit lines
- Provide lifting vessel as required
- Provide transshipment
- Provide transport vessel in case of CIF sales
Research, technology and innovation opportunities
1% of Yearly O&G Production Gross Revenues

- **Green**: Up to 0.4% investment on Consortium Partner own Research Lines
- **Blue**: Minimum 0.1% investment with Brazilian Companies
- **Blue**: Minimum 0.5% investment with Universities and Research Institutions

**Not** entitled for cost oil recovery

Entitled for cost oil recovery

Must be aligned to Tech-Sci Comm. priorities
Libra’s Scenario - Major Innovation & Science Opportunities

- Thick Carbonate Reservoirs
- Libra’s Pre-salt
- Deep-water
- High Production Wells
- Large Volumes of Associated Gas
- EOR, IOR

Science Opportunities
- Sensing
- IT & Comm. Tech.
- Materials & Corrosion

- Reservoir Imaging and Continuous Monitoring
- Flow Assurance
- Riser Systems
- Subsea Systems
- Field Architecture
- Surface Facilities
- Drilling, Completions & Intervention Costs
- Gas Processing
- IT & Comm. Tech.
- Materials & Corrosion
Technology Opportunities: Pre-salt Gas Utilization

Technical /economical feasibility of the pre-salt gas utilization is of crucial relevance to the State.

Libra’s Associated Gas
- Oil: 8-12 Bbbl;
- Gas (inc. CO₂): 560-840 BNM³;
- GOR: 440 m³/m³ w/ 44% CO₂

Total Gas (HC+CO₂)
Reinjection for EOR

CO₂ Separation & Injection + HC Gas export

Total Export Gas Pipeline (Onshore processing)

Gas To Wire (GTW)
Floating Power Plant with HVDC lines to shore

Compressed Natural Gas (CNG)

Gas To Liquids (GTL)

Floating LNG

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Floating Power Plant with HVDC lines to shore

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Floating LNG

Technical/economical feasibility of the pre-salt gas utilization is of crucial relevance to the State.
Closing remarks
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• Current industry drivers
  • Cost reduction
  • Productivity gains
  • Higher recovery rates
  • Associated gas monetization
• Ramp up of PPSA’s activities
  • Libra
  • 12 unitization processes
  • Commercialization modeling

• Local Content challenge
  • Conciliation of fast-track development with high local content requirements in a tight supply chain market
• Research, technology and innovation will play a crucial role in the long-term impact of the pre-salt development
  • Opportunities for R&D collaboration with Libra’s partners
Thank you!

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