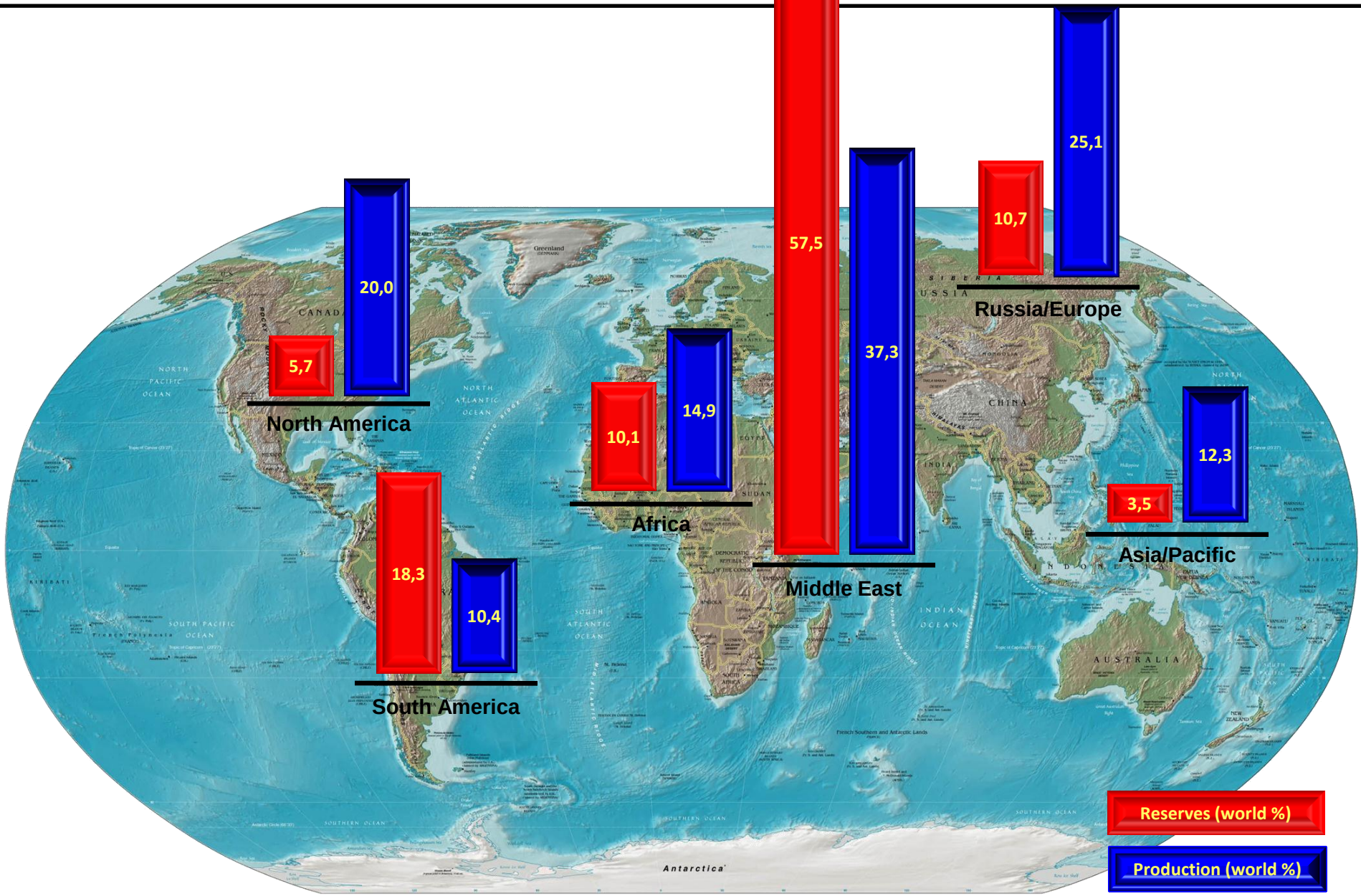
Brazilian O&G Industry: Forecast and opportunities

Presentation Contents

- ✓ Brazilian Oil industry scenario
- ✓ Forecast of oil production in Brazil
- ✓ Technological challenge for oil production in pre-salt layer
- ✓ Oil companies and service providers needs
- ✓ Market and business opportunities

World oil reserves and production



Source: OPEC Annual Statistical Bulletin, 2011

S. America reserves and production

Country	Reserves (10^9 bbl)	Production (10^3 bbl/day)
Argentina	2,5	651
Brazil	**14,2**	**2.137**
Colombia	1,9	801
Ecuador	6,2	495
Peru	1,2	157
Trinidad and Tobago	0,8	146
Venezuela	211,2	2.471
Other Countries	1,4	131

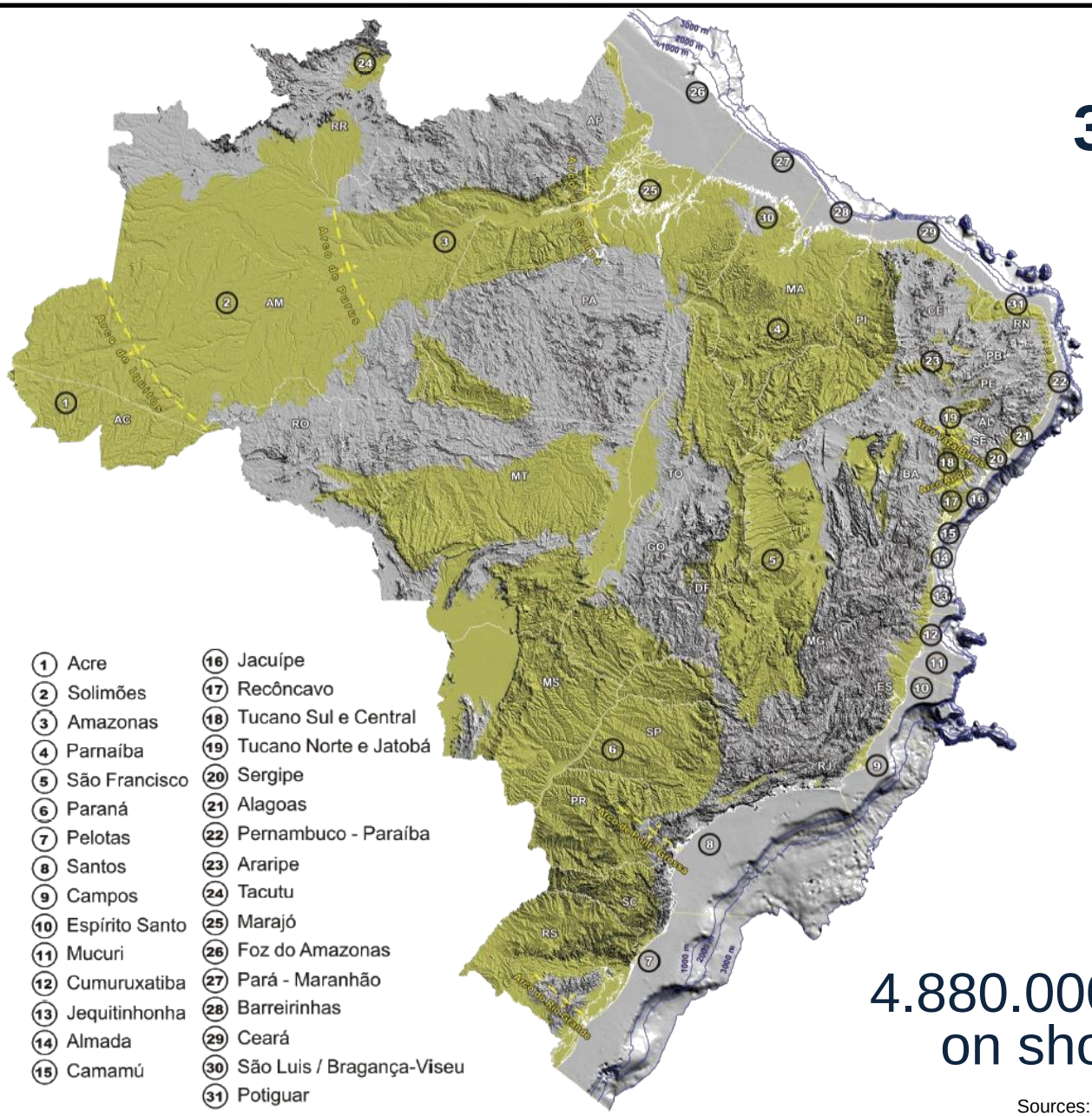
6% Regional reserves

30% Regional production

70% Regional investment

Source: OPEC Annual Statistical Bulletin, 2011

Brazilian oil potential



31 sedimentary basins

Origin
- 60% Cenozoic
- 25% Mesozoic
- 15% Paleozoic

6.430.000 km²

4.880.000 km² on shore

1.550.000 km² off shore

Sources: ANP Statistical Yearbook, 2011; IBGE Geographical Bulletin, 2012

Contracted areas for E&P

After 10 rounds (bids), last one took place in 2010

Fields under concession **765**

301 off shore
464 on shore

Exploratory phase	**345**
Development phase	**82**
Operational Fields	**321**

Total contracted area **526.555 km^2**

232.661 km^2 off shore
293.984 km^2 on shore

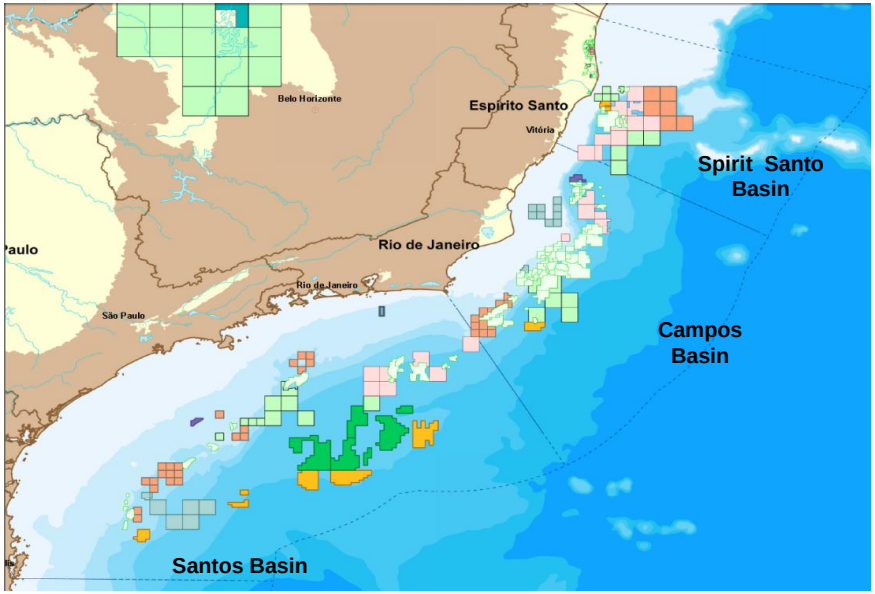
Producing wells **8955**

824 off shore
8.131 on shore

Source: ANP Statistical Yearbook, 2011

Main producing areas

In spite of E&P activities in throughout the Country, the main reserves and production are concentrated on three offshore basins



Basin	Production (bbl/d)
Campos	1.756.277
Spirit Santo	68.079
Santos	49.009
Reconceive	43.545
Sergei	41.324
Slimes	35.697
Other	46.428

- ✓ Almost 90% of oil reserves and production are located in Rio de Janeiro, Espirito Santo and São Paulo states shore. The most important industrial area in Brazil.
- ✓ Campos and Espirito Santo Basins produce in the post-salt layer since 1976, major fields are expected to be close to the production peak, but still have new discoveries and fields to be bidden.
- ✓ Santos Basin produces small quantities in the post-salt layer since 1979, but recently major reserves were find (specially for gas)

Sources: ANP Statistical Yearbook, 2011; Roberto Giannini, 2012

Brazilian oil characteristics

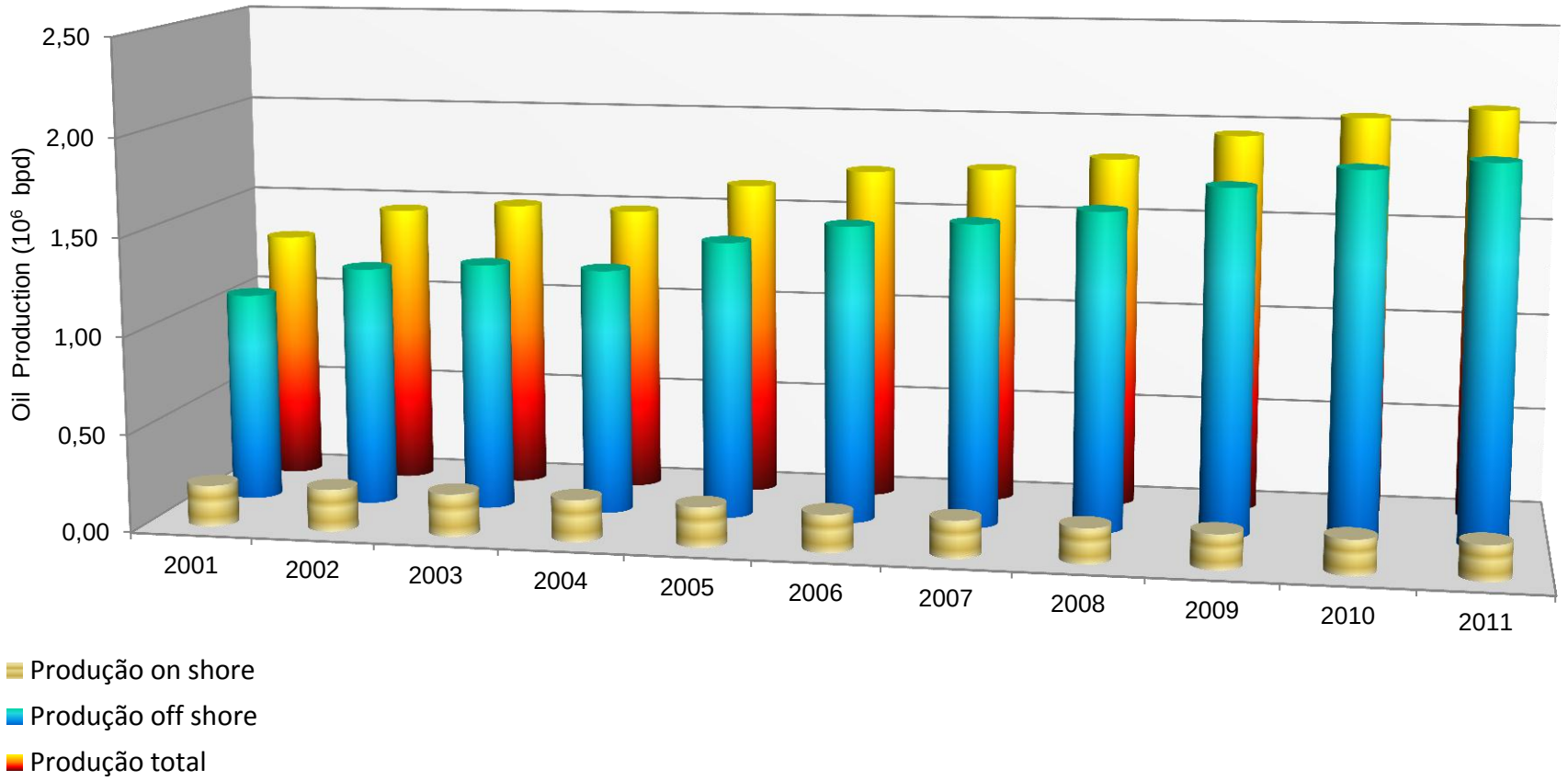
Specific gravity	Production (%)
Light	8,6
Intermediate	73,0
Heavy	18,4

Composition	Production (%)
Paraffinic	3,8
Aromatic	96,2

Typical Brazilian Oil: **Aromatic 25 ºAPI**

Source: Roberto Giannini, 2012

Oil production evolution



Average 2011 production: 2,1 Mbpd

Source: ANP Statistical Yearbook, 2011

Oil production evolution

Since Brazil broke Petrobras Monopoly on E&P activities (1997), the total oil production grew from

0,9 Mbpd → **2,1 Mbpd**

On shore production still at the same level
~ 200 kbpd

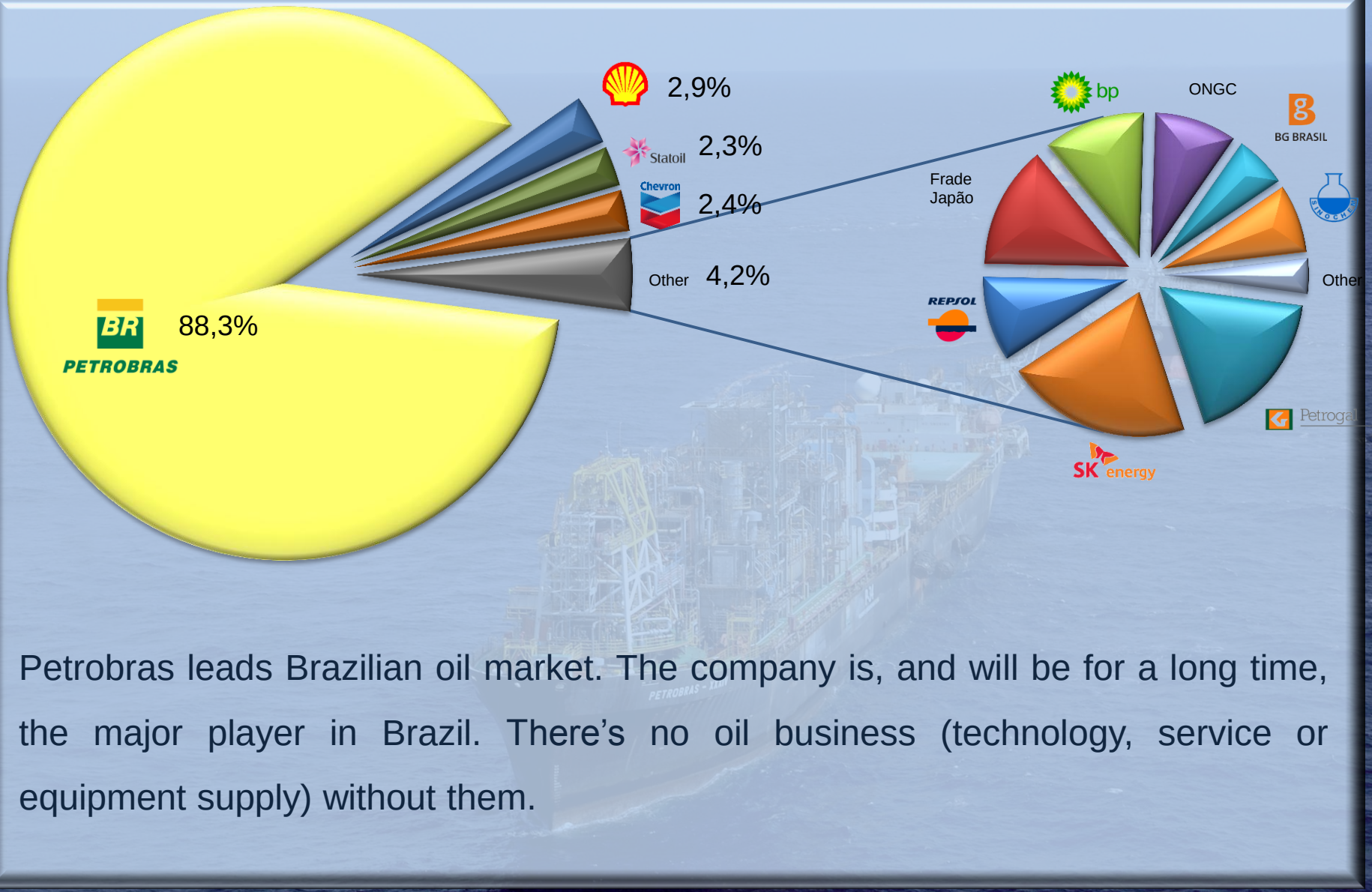
Off-shore production grew **1,2 Mbpd**

PETROBRAS added **1,0 Mbpd**

Other Local and IOC added **0,2 Mbpd**

Source: ANP Statistical Yearbook, 2011

Oil production share

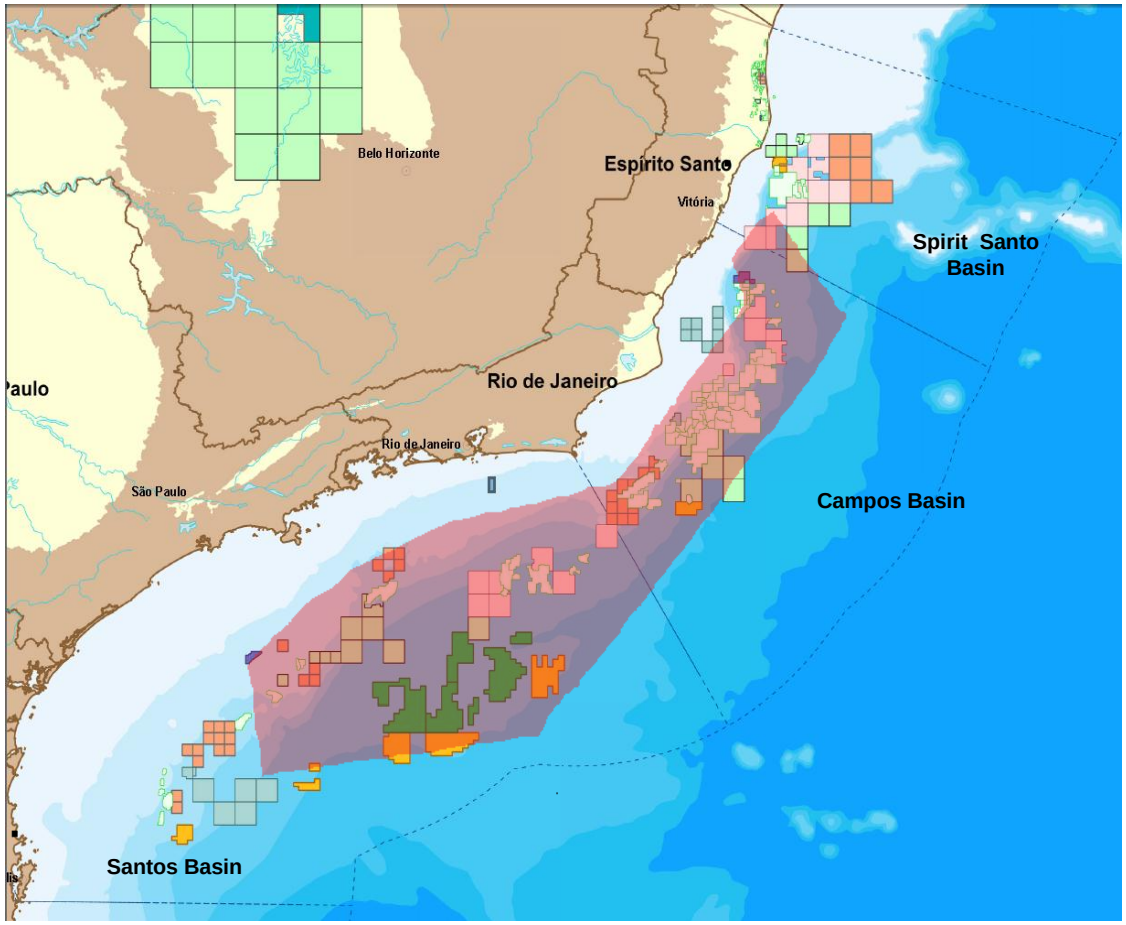


Petrobras leads Brazilian oil market. The company is, and will be for a long time, the major player in Brazil. There's no oil business (technology, service or equipment supply) without them.

Sources: ANP Monthly Statistical Bulletin, 2011/2012; Companies

The pre-salt province

In 2006 Petrobras finds oil on Campos Basin on the pre-salt layer. In 2008 the “pre-salt province” was mapped.



Total pre-salt province area
(As defined in the regulation)

149.000km²

Previously contracted area

41.772 km²

Petrobras	35.739 km²
Other (IOC’s and local)	6.033 km²

Available area
(will be bided until 2014)

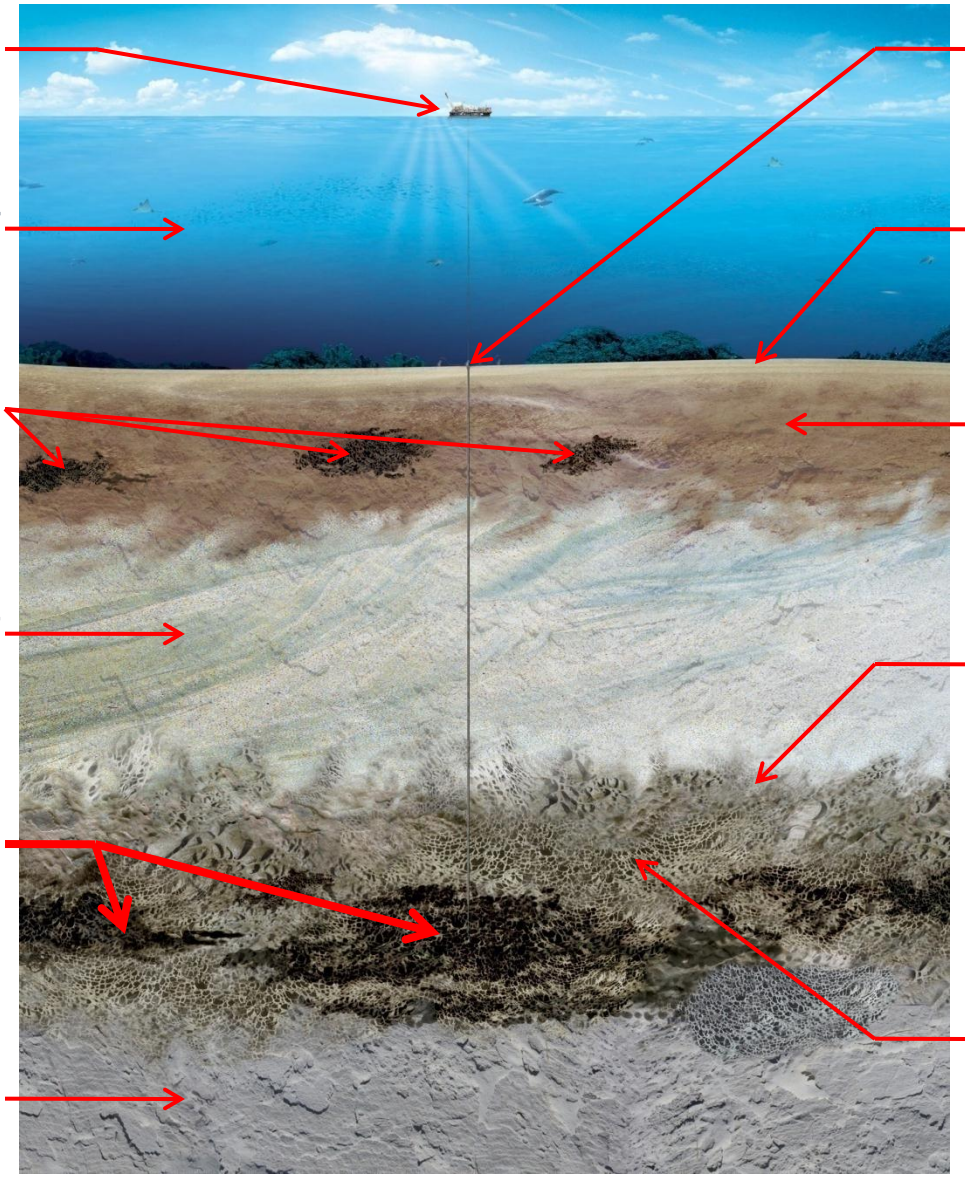
107.228 km²

Expected recoverable reserves

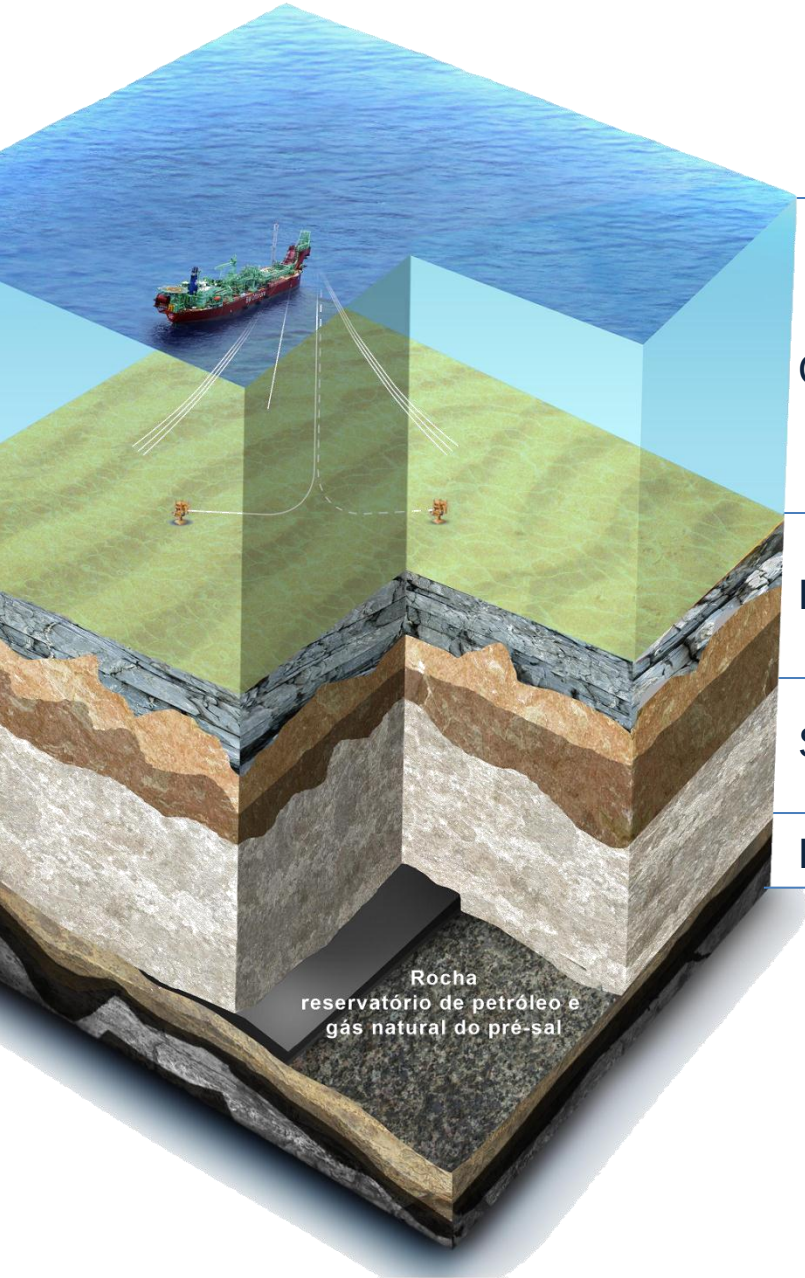
80 ~ 100 x10⁹ bbl

Sources: Roberto Giannini, 2011

Oil on pre-salt layer



Pre-salt layer oil drilling challenge



Ocean deep: **2.200~3.300 m**

Post-salt layer: 1.000~2.500 m

Salt layer : 1.500~2.400 m

Pre-salt layer: 500~1.500 m

Well deep:
3.000~6.400 m

By the way…

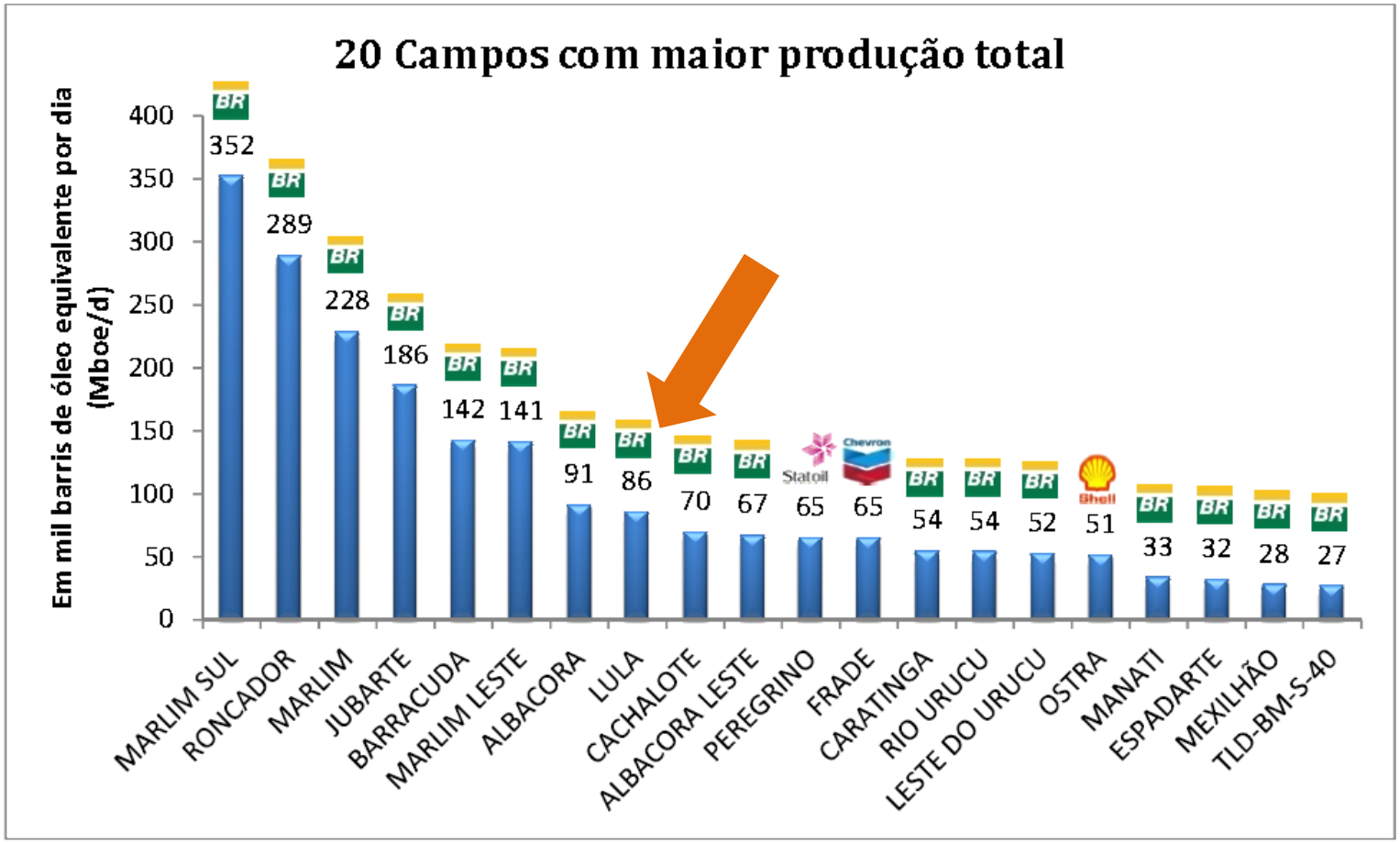
Linear distance to the coast: **150~330 km**

Pre-salt production potential

BOLETIM DA PRODUÇÃO DE PETRÓLEO E GÁS NATURAL
JANEIRO DE 2012

4.5.3 20 Maiores Campos Produtores (BOE)

FONTE ANP/ SDP/ SIGEP



Source: ANP - Boletim da Produção de Petróleo e Gás Natural, Janeiro de 2012

Pre-salt production potential

BOLETIM DA PRODUÇÃO DE PETRÓLEO E GÁS NATURAL
JANEIRO DE 2012

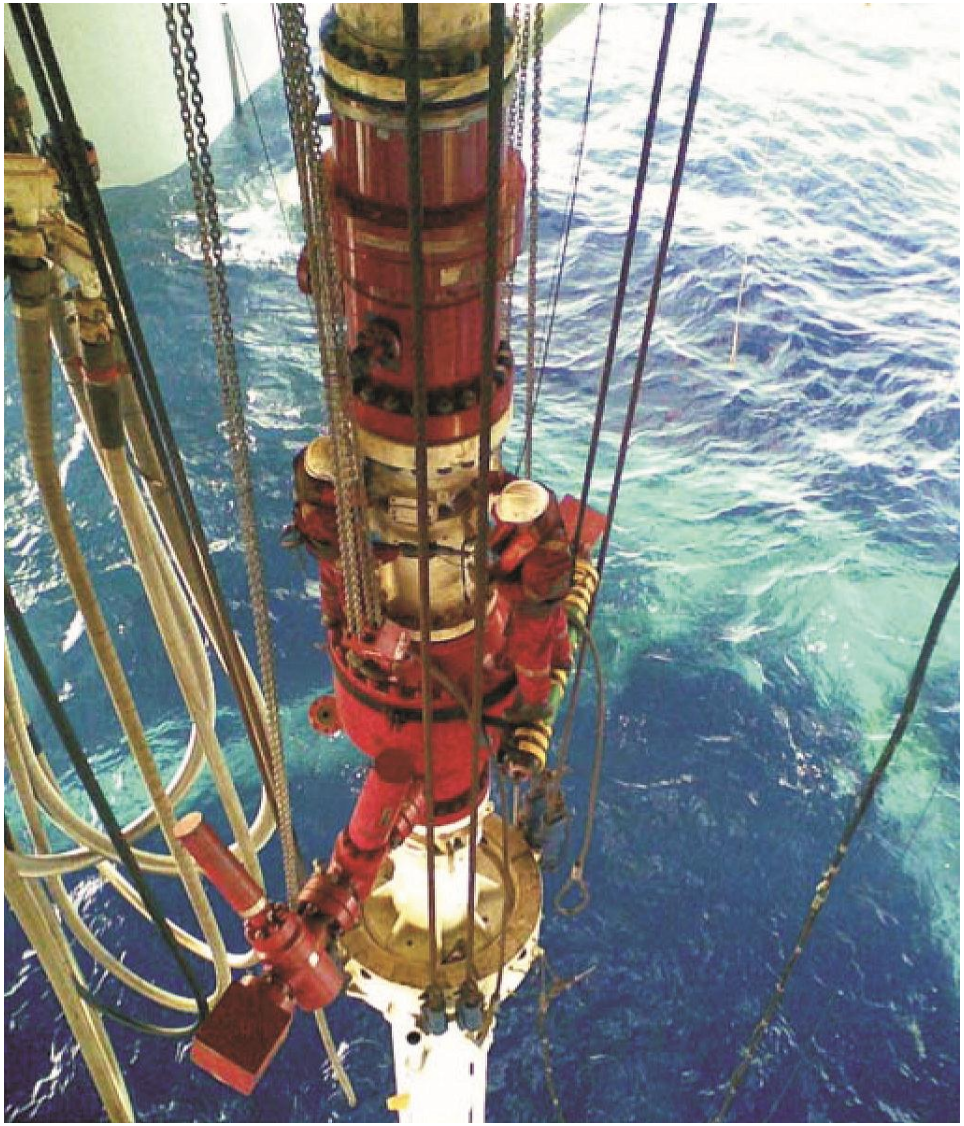
4.5.5 Relação dos 30 poços com maior produção de petróleo

FONTE ANP/SDP/SIGEP

Nº	Bacia	Campo	Nome ANP do Poço	Localização	Operador	Petróleo (bbl/d)
1	Santos	LULA	9BRSA716RJS	Mar	Petrobras	27.195
2	Santos	LULA	3BRSA496RJS	Mar	Petrobras	25.867
3	Campos	MARLIM SUL	7MLS179HPRJS	Mar	Petrobras	24.238
4	Campos	CACHALOTE	7CHT7HPESS	Mar	Petrobras	24.006
5	Campos	CACHALOTE	7CHT9HESS	Mar	Petrobras	22.913
6	Campos	MARLIM SUL	7MLS153HRJS	Mar	Petrobras	21.916
7	Campos	JUBARTE	6BRSA639ESS	Mar	Petrobras	21.813
8	Campos	JUBARTE	7JUB27HPESS	Mar	Petrobras	20.670
9	Campos	CARATINGA / BARRACUDA	6BRSA806RJS	Mar	Petrobras	20.451
10	Campos	MARLIM LESTE	7MLL10HPRJS	Mar	Petrobras	19.954
11	Campos	MARLIM LESTE	6BRSA817RJS	Mar	Petrobras	19.666
12	Campos	MARLIM LESTE	7MLL54HPRJS	Mar	Petrobras	19.471
13	Campos	JUBARTE	7JUB24HESS	Mar	Petrobras	18.737
14	Campos	MARLIM SUL	7MLS63HPARJS	Mar	Petrobras	18.381
15	Campos	MARLIM SUL	7MLS157HRJS	Mar	Petrobras	18.331
16	Campos	JUBARTE	7JUB19HESS	Mar	Petrobras	18.287
17	Campos	CACHALOTE	7CHT5HAESS	Mar	Petrobras	18.015
18	Campos	JUBARTE	7JUB16HPESS	Mar	Petrobras	16.647
19	Campos	RONCADOR	7RO41DRJS	Mar	Petrobras	16.477
20	Santos	TLD-BM-S-9	3BRSA861SPS	Mar	Petrobras	16.072
21	Santos	TLD-BM-S-40	1BRSA607SPS	Mar	Petrobras	15.466
22	Campos	MARLIM SUL	7MLS177HPRJS	Mar	Petrobras	15.357
23	Santos	LULA	9BRSA908DRJS	Mar	Petrobras	14.636
24	Campos	RONCADOR	7RO92DRJS	Mar	Petrobras	14.543
25	Campos	RONCADOR	7RO46HPRJS	Mar	Petrobras	14.479
26	Campos	RONCADOR	7RO9DRJS	Mar	Petrobras	14.306
27	Campos	BARRACUDA	7BR73HPARJS	Mar	Petrobras	14.181
28	Campos	MARLIM SUL	7MLS99HPRJS	Mar	Petrobras	13.611
29	Campos	JUBARTE	7JUB13HPESS	Mar	Petrobras	13.330
30	Campos	MARLIM LESTE	7MLL50HRJS	Mar	Petrobras	13.283

Source: ANP - Boletim da Produção de Petróleo e Gás Natural, Janeiro de 2012

Pre-salt well cost evolution



First Well drilled

Took **1 year** to be completed

Cost **US$ 240 million**

Learning curve

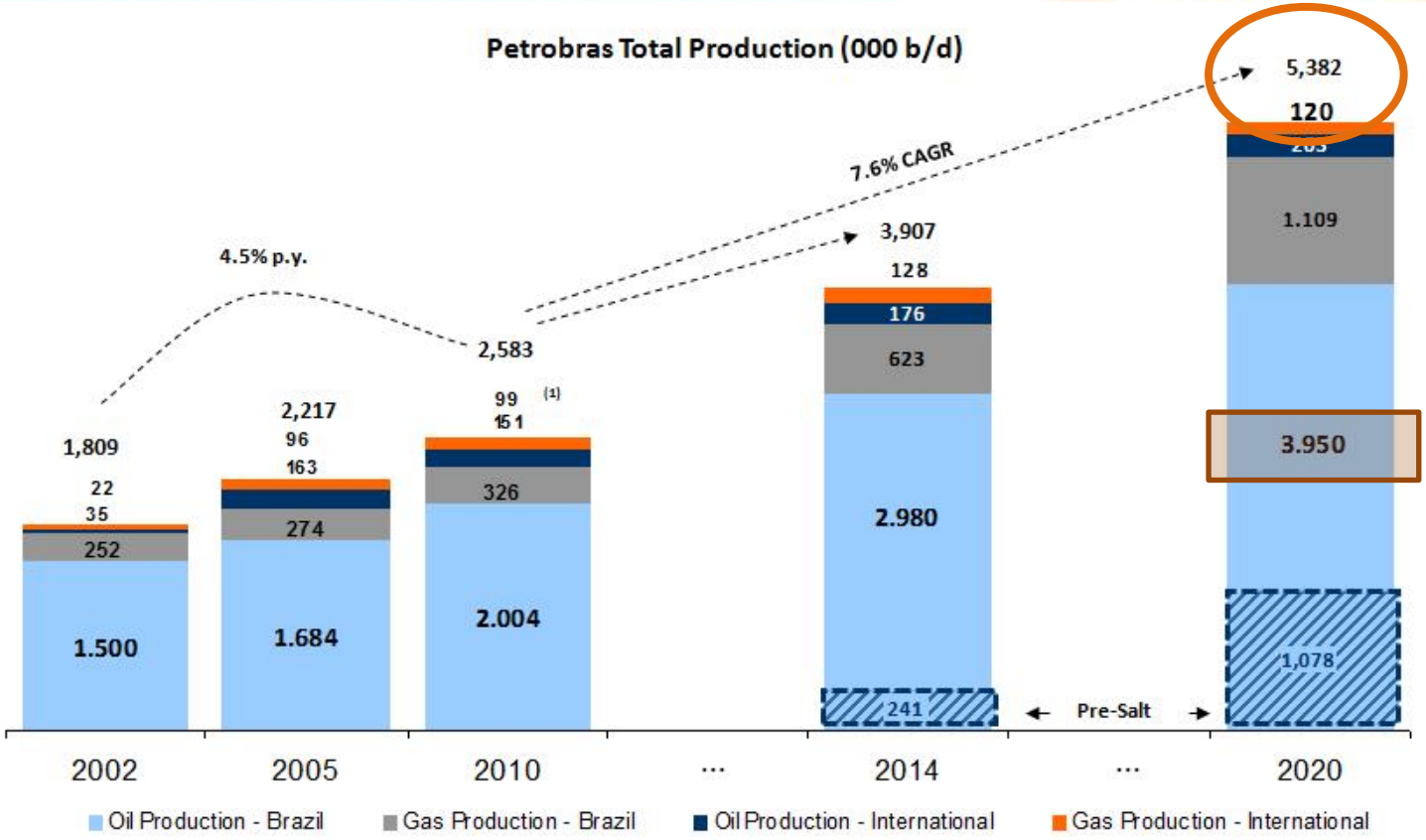
Last well drilled

Took **60 days** to be completed

Cost **US$ 66 million**

Petrobras strategic plan

Production growth fully supported by discoveries



- **Targets don't include production from the Transfer of Rights area, which will significantly improve production by 2020.**

Source: Petrobras CFO conference @ BTG CEO Conference 2011

Petrobras strategic plan

New vessels and purchase of new equipments

Critical Resources	Current [illegible]ation (Dec/	Delivery Plan (to be contracted) Accumulated Value		
		By 2013	By 2015	By 2020
Drilling Rigs Water Depth Above 2.000 m	15	26	31	53*
Supply and Special Vessel	254	465	491	504
Production Platforms SS e FPSO	44	53	63	84
Others (Jacket and TLWP)	79	81	83	85


Supply Vessel


Drilling Rigs


Production Platform (FPSO)

26 rigs contracted, 28 more to be built by 2020:

- Until 2013: 13 rigs contracted before 2008 and 1 rig relocated from international operations*; +12 new rigs contracted in 2008 , through international bidding;
- 2013-2020: Bidding process in progress, to contract 28 rigs to be built in Brazil. EAS won the bid for the first package - construction and chartering of seven drilling rigs to be built in brazil

* The rig reallocated from international operations, expire in 2015, so it is not considered in the 2020 accumulated value

Source: Petrobras CFO conference @ BTG CEO Conference 2011

Petrobras strategic plan

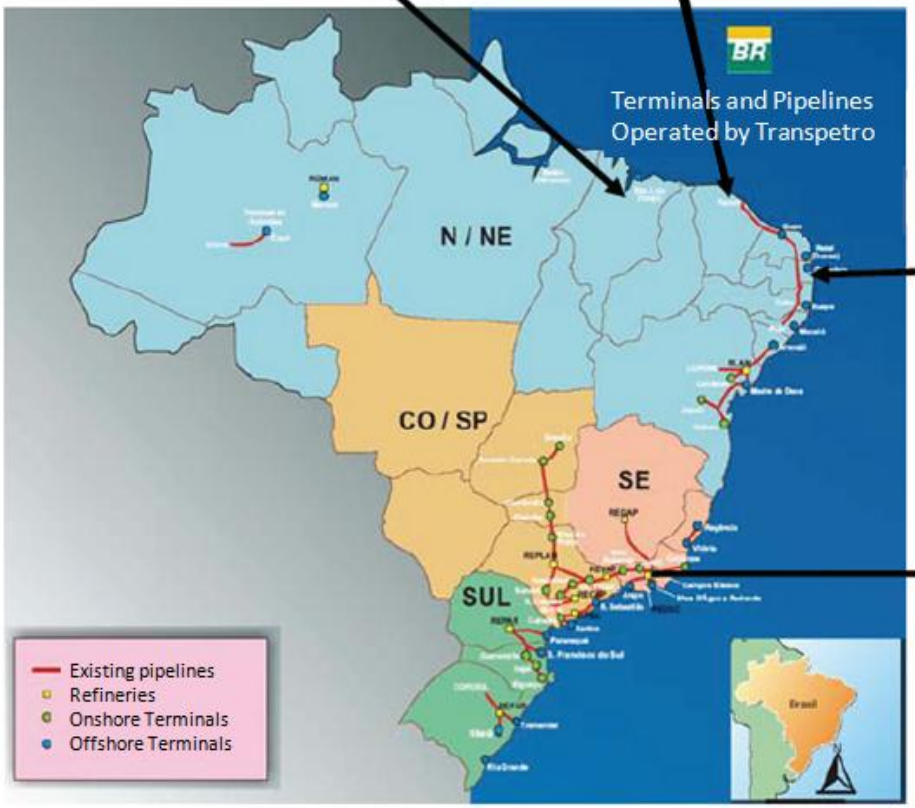
Petrobras' Domestic Refining Greenfields Capacity Additions

(600 kbpd) **PREMIUM I**

PREMIUM II (300 kbpd)

(Premium I & II)

Diesel 10 ppm (60%), LPG (4%), Naphtha (14%), Jet (12%), OC + Bunker (10%)



(230 kbpd)

RNEST (Abreu e Lima)

Diesel (64%), LPG (3%), Naphtha (6%), Bunker (16%), Coke (11%)

(330 kbpd)

COMPERJ

Diesel (53%), LPG (6%), Naphtha (1%), Jet (28%),OC (4%), Coke (8%)

Numbers in kbpd are capacities

PETROBRAS 17

Source: Petrobras CFO presentation @ BTG CEO Conference 2011

Petrobras strategic plan

Actual Refining Capacity:	2.1 Mbpd 13 Refineries
Planned revamps:	0,4 Mbpd
New refineries:	1,5 Mbpd
Projected capacity (2014):	**4,0 Mbpd**

Considering only Petrobras units in Brazil

Petrobras strategic plan

Business Plan 2010-14: US$ 224 billion
Increased investment for integrated operations in Brazil

Petrobras' Corporate Strategy to 2020

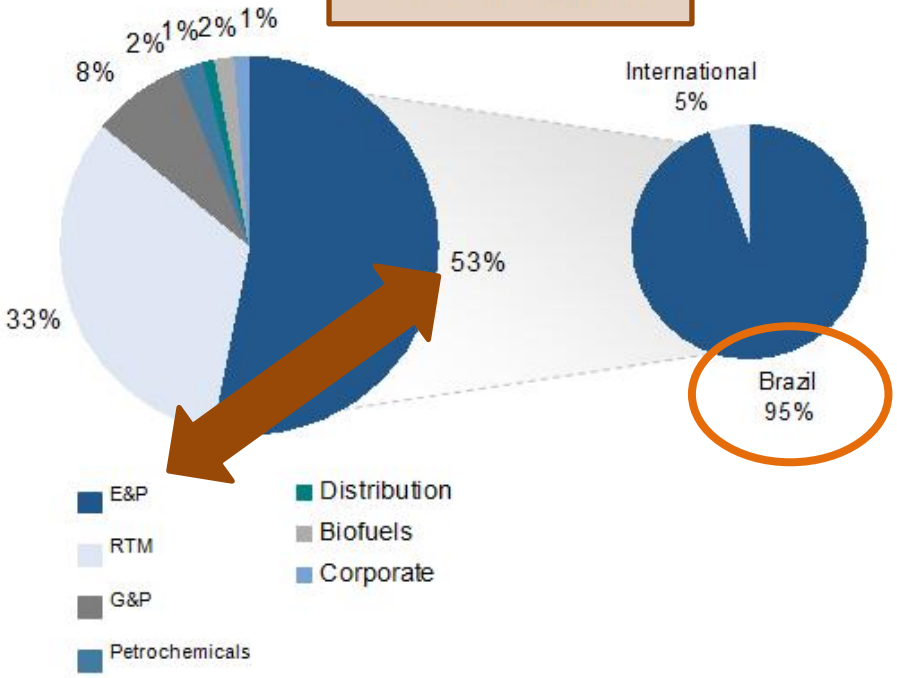
Integrated Growth, Profitability and Sustainability

- ✓ Oil & gas production growth in a sustainable manner that will approximately double our production in the next 10 years
- ✓ Focus in oil, oil products, petrochemicals, gas & energy, biofuels, refining and distribution with an integrated and sustainable business model
- ✓ Consolidate leadership in the Brazilian market of natural gas, electricity generation and gas chemicals

Be recognized as a benchmark among integrated energy companies

Total Capital Investment Plan 2010-2014

US$ 224.1 billion

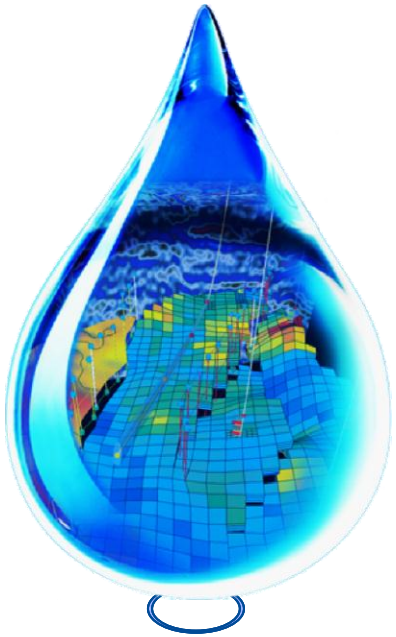


Source: Petrobras CFO presentation @ BTG CEO Conference 2011

The million dollar question:

How can we take advantage of this scenario and convert it into business opportunities?

Field operator’s main challenges



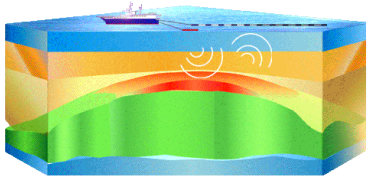
Reservoir characterization and data interpretation

Logistics, production management and cost

Operational safety and production control

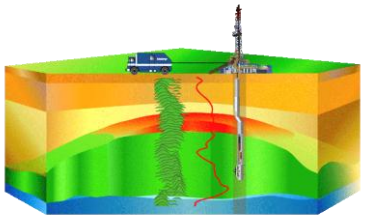
Technology development

Services provider's challenge

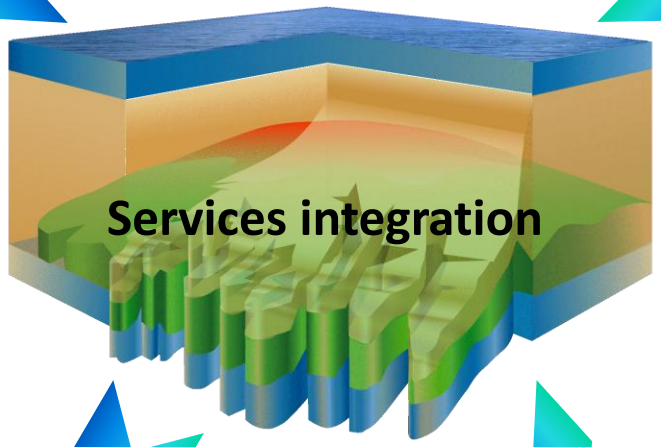


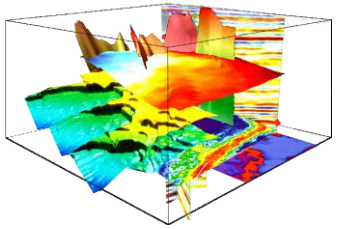
Seismic and reservoir characterization

Production Management and logistics

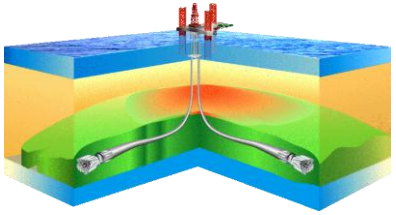


Field development and delimitation

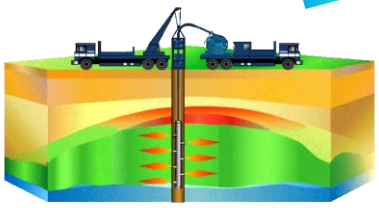




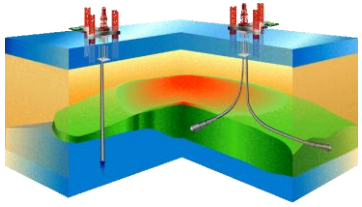
Information systems and databases



Drilling and exploration



Production optimization and oil flow



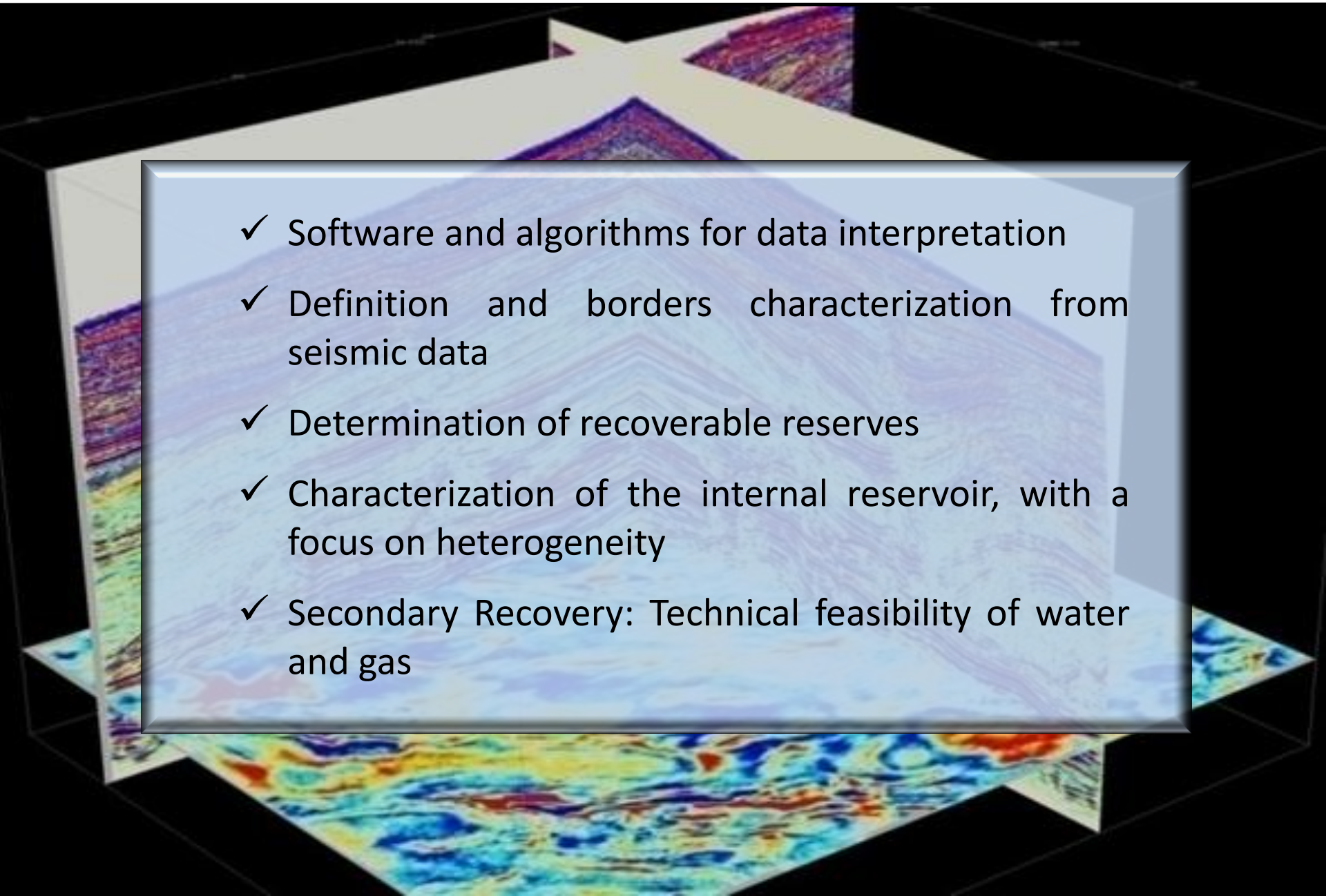
Well completation and well services

Based on those needs, we prepared a short list of critical services, goods and technologies that can be supplied for the Brazilian O&G market.

This is a non-exhaustive list. If your product or service is not listed here, never mind.

We probably need it any way…

Reservoirs



- ✓ Software and algorithms for data interpretation
- ✓ Definition and borders characterization from seismic data
- ✓ Determination of recoverable reserves
- ✓ Characterization of the internal reservoir, with a focus on heterogeneity
- ✓ Secondary Recovery: Technical feasibility of water and gas

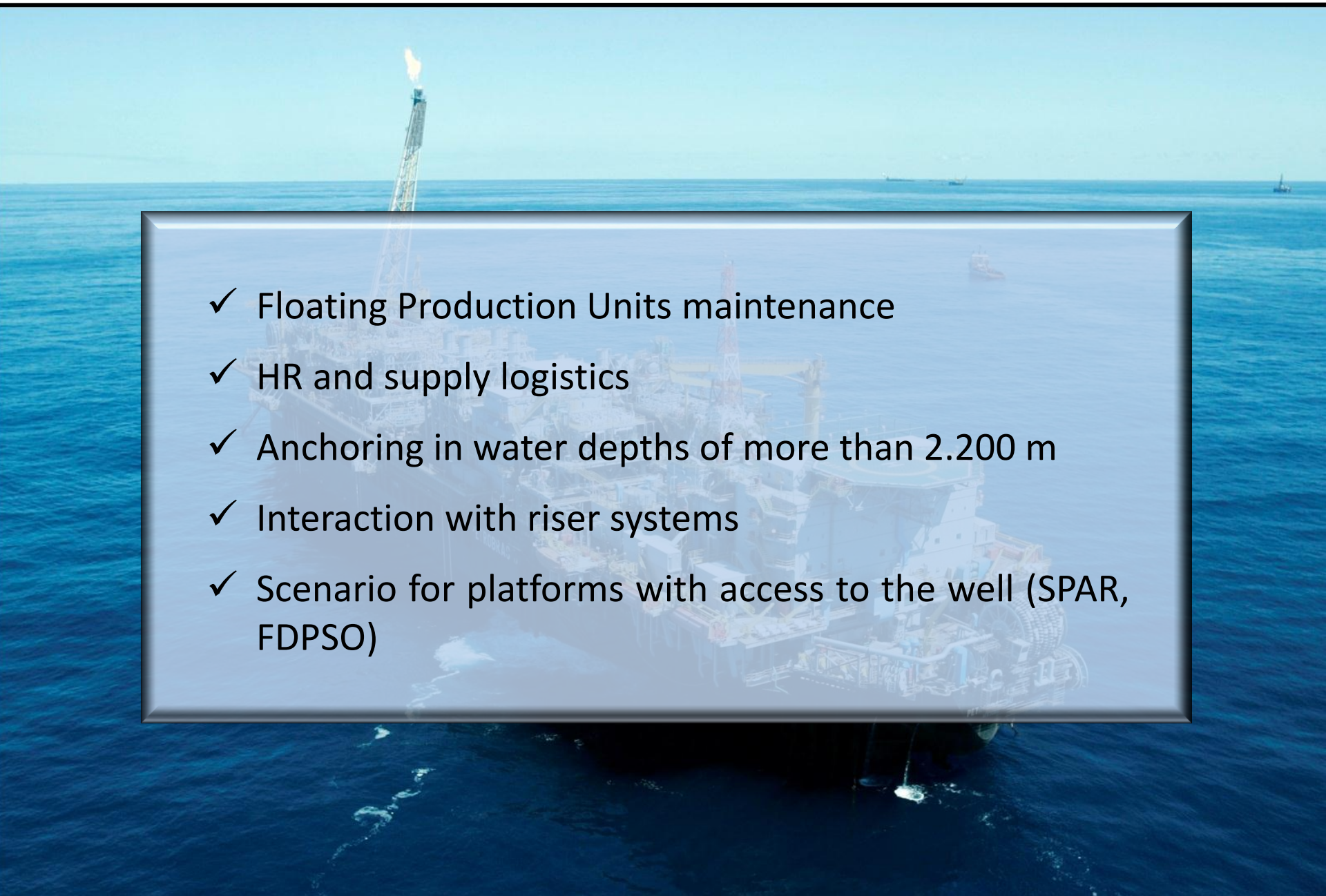
Drilling/Well engineering

- ✓ Columns stability on salt layer, salt “plastic” behavior
- ✓ Salt Solubility on drilling fluids
- ✓ Drill’s Corrosion control and prevent
- ✓ Hydraulic fractures on directional wells
- ✓ Alloys and well’s materials resistant to high CO_2
- ✓ Hydrates control
- ✓ Well Completions
- ✓ Support to diving and ROV operation
- ✓ Support to mooring activities;
- ✓ Special support vessels;

Subsea Engineering

- ✓ Qualification of risers for high CO_2 pressure
- ✓ Qualification of lines with thermal insulation
- ✓ Injection lines of high gas pressure
- ✓ Subsea sphere valves and pumps
- ✓ Subsea sensor for measuring the oil and grease content in water
- ✓ Well temperature and pressure
- ✓ Subsea optical connectors
- ✓ Sensor network for natural gas flow measurement
- ✓ Monitored cathode protection system for pipelines

Rigs, vessels and FPSO’s



- ✓ Floating Production Units maintenance
- ✓ HR and supply logistics
- ✓ Anchoring in water depths of more than 2.200 m
- ✓ Interaction with riser systems
- ✓ Scenario for platforms with access to the well (SPAR, FDPSO)

Engineering and Maintenance

- ✓ Risers, risers buoyancy systems construction and maintenance
- ✓ Marine equipment maintenance
- ✓ Pipeline’s construction, multi phase pipelines construction and pressure vessels
- ✓ Electromagnetic inspection in steel cables, non-destructive tests
- ✓ Inspection of Electromagnetic Drill pipes including machining through refacing hard band and application using welding
- ✓ Anticorrosive coating by application of Xylan in subsea parts
- ✓ Application by welding Inconel alloy for corrosion protection
- ✓ Polymers floating materials


Doing business in

Doing business in Brazil - Focus

- Find a local partner and focus on hiring local content
- Companies want to see technology… show them ready-to-use technology
- Keep your attention on Health, Safety and Environment
- In general, companies are well capitalized and have access to government funds to invest. But… You can be creative and show ways do fund globally…
- Many non-Petrobras companies teams and directors are ex-Petrobras employees. You will see Petrobras way to do business everywhere…

Doing business in Brazil - Tips

- Brazil is a democratic, low-risk and stable country, both in political and economic fields.
- Europeans are well respected for their tradition, culture, respectability and low-profile approach to business.
- Brazilians are not used to doing business with people and companies they don't know. Be low-key and invest time to work with your local counterpart.
- Brazil is not corrupt. Don't make that assumption! If you try "shortcuts", you'll have problems…
- In other hand… We are very Bureaucratic... Learn the System and be patient...

Final message

When you plan a overseas investment

Take a look at Brazil

Thanks for your attention

(and for your patience…)

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