

Pre-salt Santos basin

Carlos Alves

Head of Exploration & Production



Overview

Exploration assets

Angola development

Brazil exploration assets

Pre-salt Santos basin

Final remarks

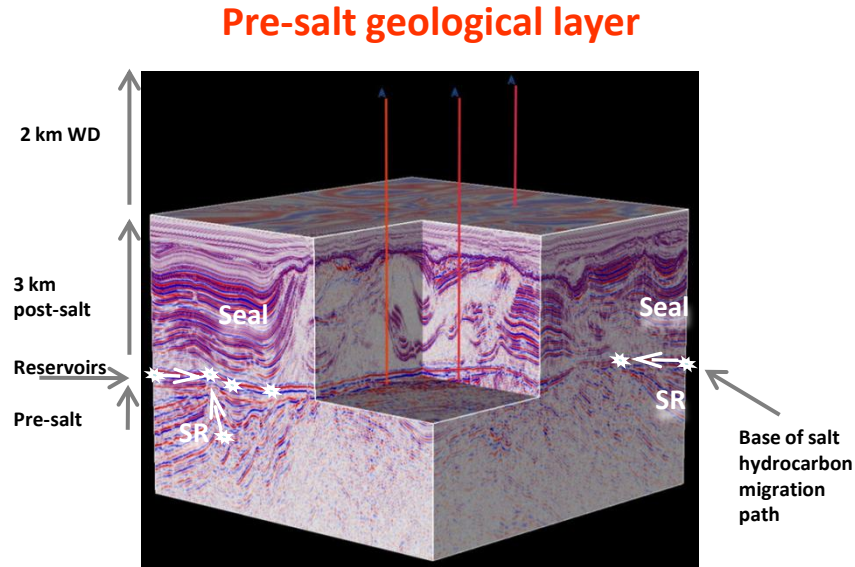
Stromatolites are the best pre-salt reservoir

Stromatolites in the Lagoa Salgada, Brazil



- Stromatolites and other carbonates are the main reservoir in pre-salt
- The process of formation of stromatolites still occurs today
- Due to its formation process stromatolites presents porosity and permeability superior to the remaining carbonates section

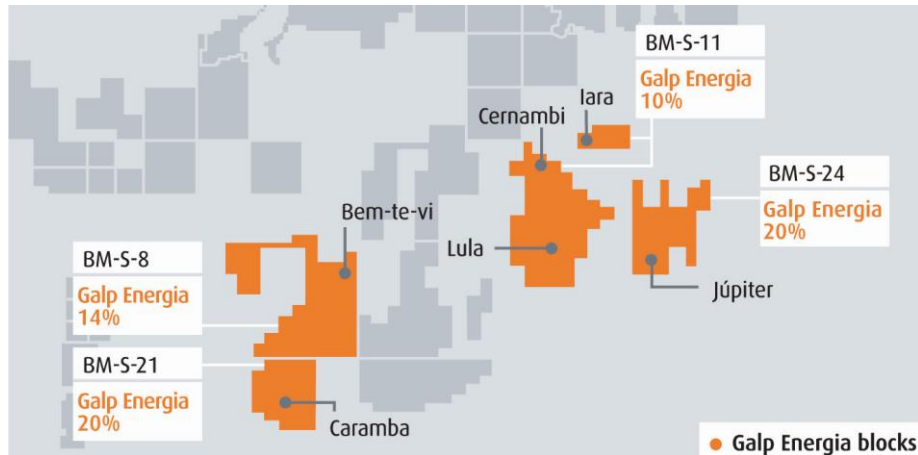
New frontier exploration developed into high success case



- In early 2000's, pre-salt play was recognized as having high potential but very high risk related to reservoir depth
- Key success reservoir characteristics: mature source rock, migration paths, trap, seal and synchronism
- A challenge due to the geological unknown, water depth and 2,000 metres evaporitic sequence (salt)

Santos basin is a key area in current portfolio

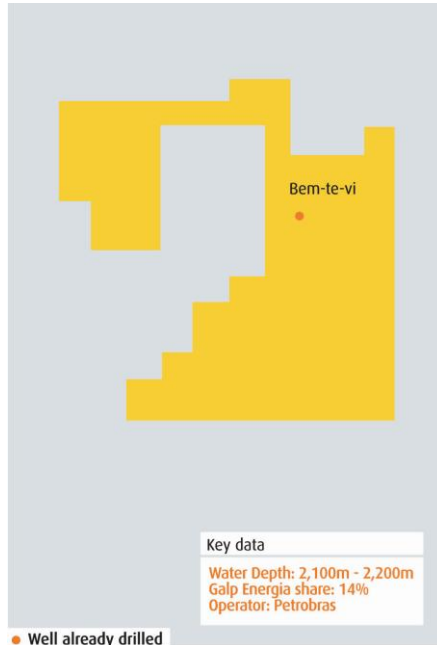
Pre-salt Santos basin



- The total area of the pre-salt province is over 110,000 km², with discoveries along Santos, Campos and Espírito Santo basins
- Pre-salt Santos basin with 50 Bln boe of reserves according to ANP
- Galp Energia was within the first to cream the play, with Tupi discovery in 2006
- 19 wells drilled in four blocks with 100% success rate

First discovery in 2007 with Bem-te-vi well

BM-S-8



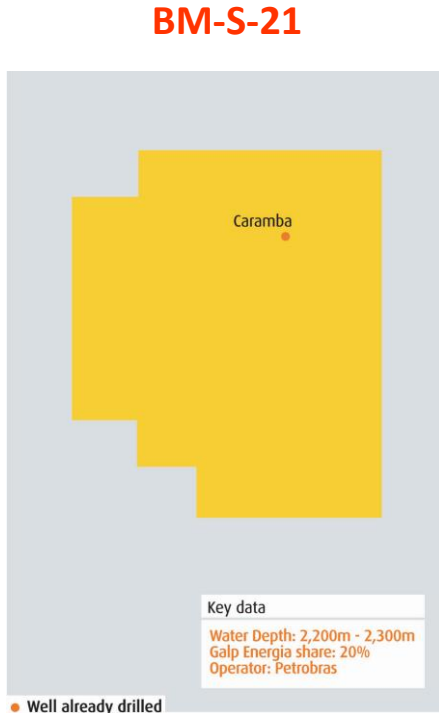
- Contract for BM-S-8 signed in 2000
- 3D seismic covering all block acquired in 2002
- Bem-te-vi well in 2007 found a reservoir of light oil with API density within the range of 28° - 30°
- 3D seismic reprocessing in 2008 according with the evaluation phase
- Evaluation plan for 2,432 km² from a total initial area of 4,864 km²

Two exploration wells in 2011 in BM-S-8



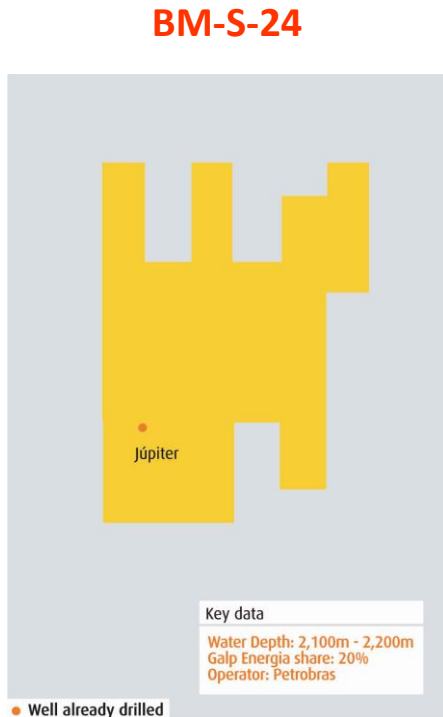
- Detailed 3D seismic interpretation ongoing
- Two exploration wells to be drilled in 2H11, targeting two new prospects of several identified
- EWT expected in 2012
- Declaration of commerciality to be delivered by December 2012

Appraisal activity underway in BM-S-21



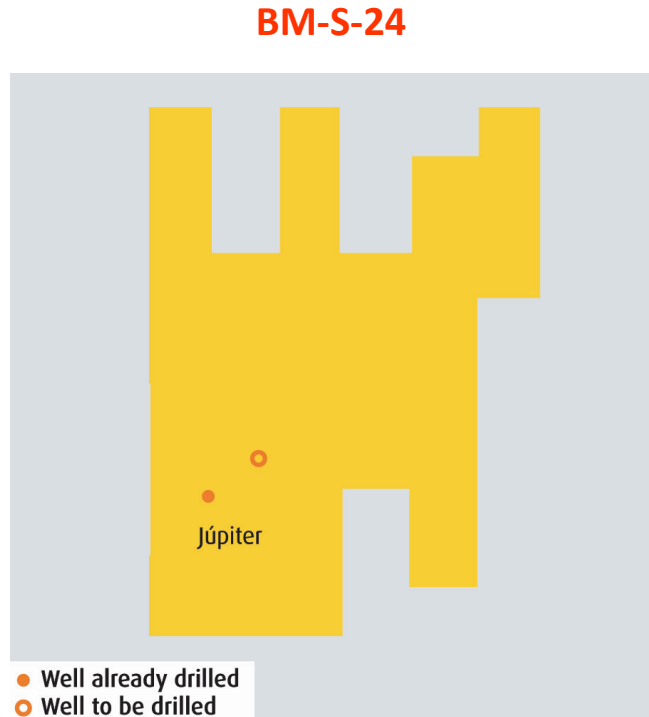
- Presence established in 2001
- 3D seismic covering part of the block acquired in 2003
- Caramba light oil discovery in 2007
- 3D seismic re-processing in 2009 and 2010
- 2nd exploration well will be drilled in 2013 (location still to be decided)
- Expected declaration of commerciality by April 2015

Júpiter in BM-S-24 is a large hydrocarbon bearing structure



- Presence in BM-S-24 established in 2001
- 3D seismic covering all block acquired in 2003
- Significant oil, condensate and gas discovery in 2007 with CO₂ content
- Evaluation plan for 1,394 km² from a total initial area of 2,788 km²

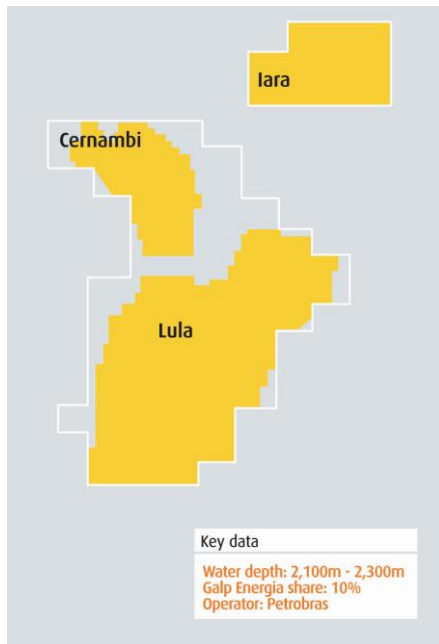
Next appraisal well will decrease uncertainty of reservoir content



- One appraisal well scheduled for 2011 to study CO₂ distribution in reservoir
- Special 3D reprocessing to improve reservoir imaging to be executed in 2011
- 3D high resolution seismic acquisition planned for 2012
- Contingent EWT to be performed before February 2016
- Expected declaration of commerciality until February 2016

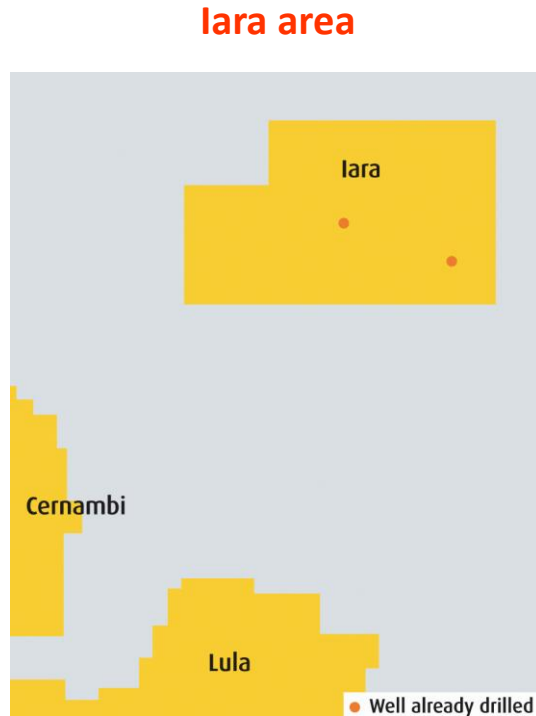
BM-S-11 is a great success

BM-S-11



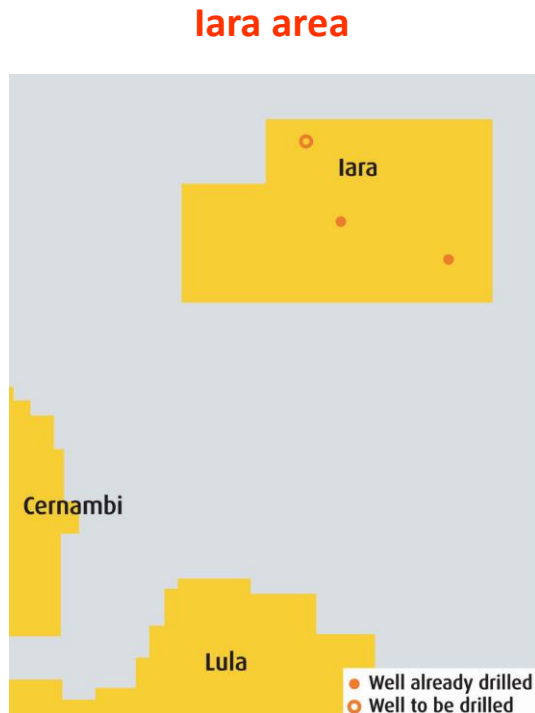
- Presence in BM-S-11 established in 2000
- 3D seismic covering all the block in 2002
- Tupi well in 2006 found hydrocarbons in cretaceous pre-salt interval
- 16 exploration and appraisal wells drilled so far, with 100% success rate
- 3,180 km² of 3D high resolution seismic acquired for Tupi area in 2009
- EWT in May 2009 and pilot production in October 2010

Iara is another high potential area in BM-S-11



- In evaluation phase since the end of 2008
- Two wells drilled so far, Iara and Iara Horst, increased reservoir knowledge
- Expected recoverable volumes of 3 to 4 Bln boe
- API between 26° and 30°

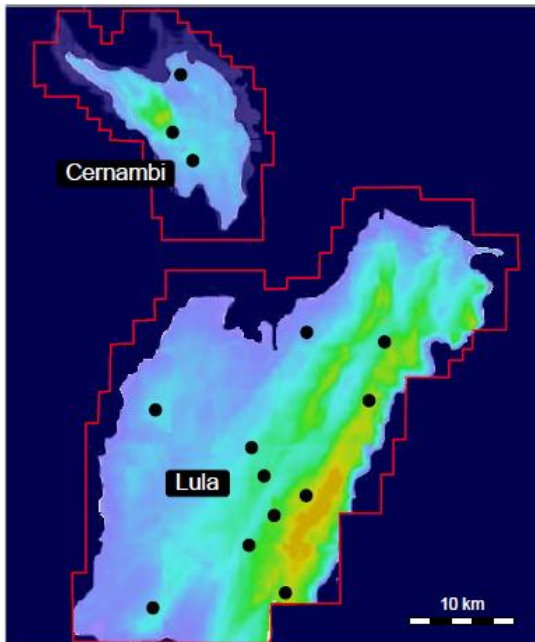
lara's development plan being prepared



- Formation tests to perform on lara Horst
- 3D high resolution seismic acquisition planned for 2011
- One appraisal well to be drilled in 4Q11
- EWT scheduled for 2013
- Expected declaration of commerciality by December 2013

Lula and Cernambi is the largest field development programme of the past 30 years

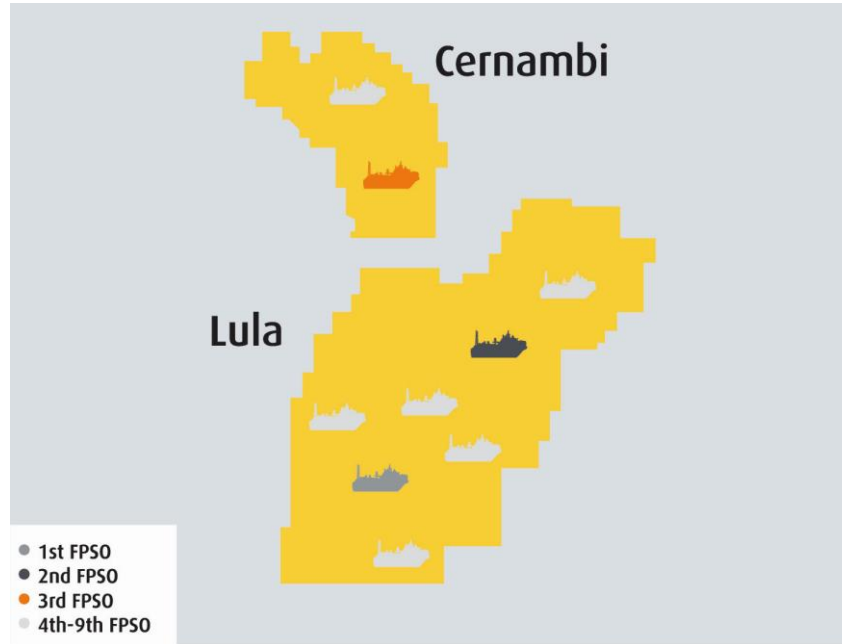
Lula and Cernambi fields



- Area: Lula 1,172 km²
Cernambi 348 km²
- Declaration of commerciality and field development programme submitted to ANP in December 2010
- Total recoverable volumes of 8.3 Bln boe, of which, 6.44 Bln boe in Lula and 1.82 Bln boe in Cernambi

FPSO contracting strategy being executed for nine FPSO

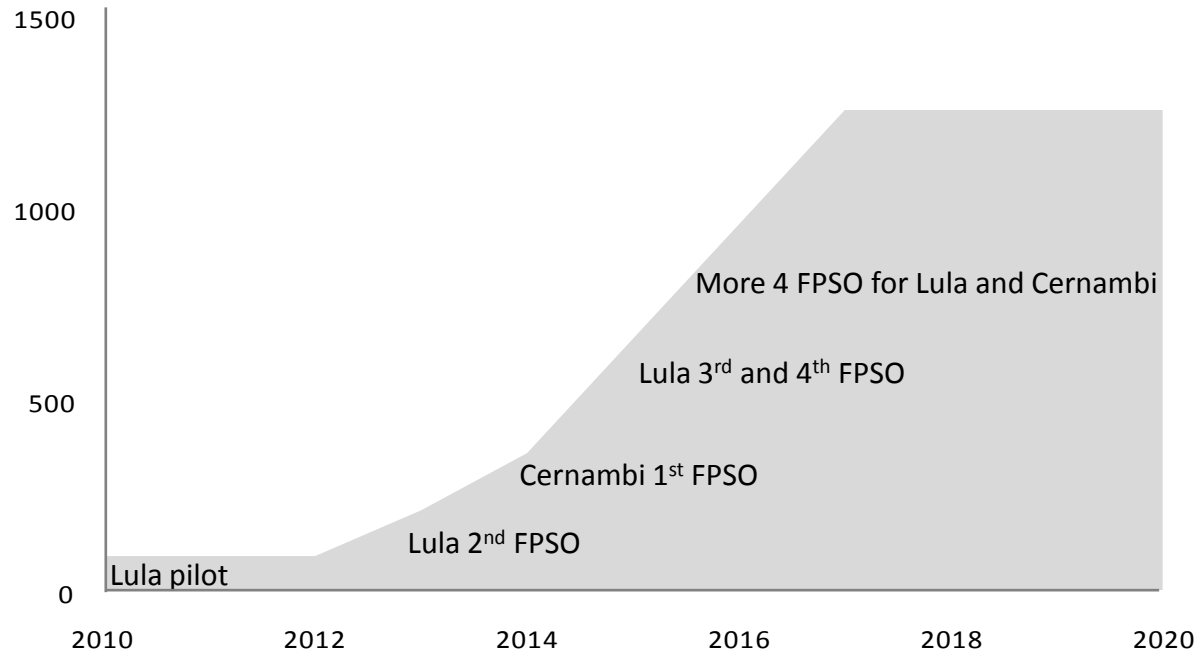
FPSO deployment in Lula/Cernambi



- 1st FPSO (charter): Cidade de Angra dos Reis, already producing
- 2nd FPSO (charter): Cidade de Parati, being converted
- 3rd FPSO (charter): tender ongoing
- 4th-9th FPSO (EPC): Hull EPC contract awarded, LLI tender ongoing
- Key objectives: adherence to first oil schedule, maximization of local content and cost efficiency via economies of scale

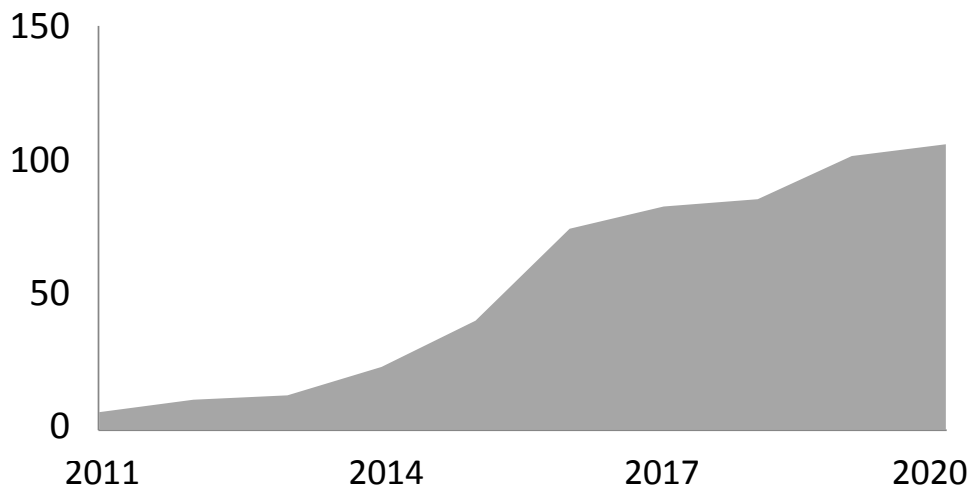
Gross installed oil capacity up to 1,270 kbopd by 2017

Gross FPSO oil production capacity (kbopd)



Lula/Cernambi production of more than 100 kboepd in 2020 net to Galp Energia

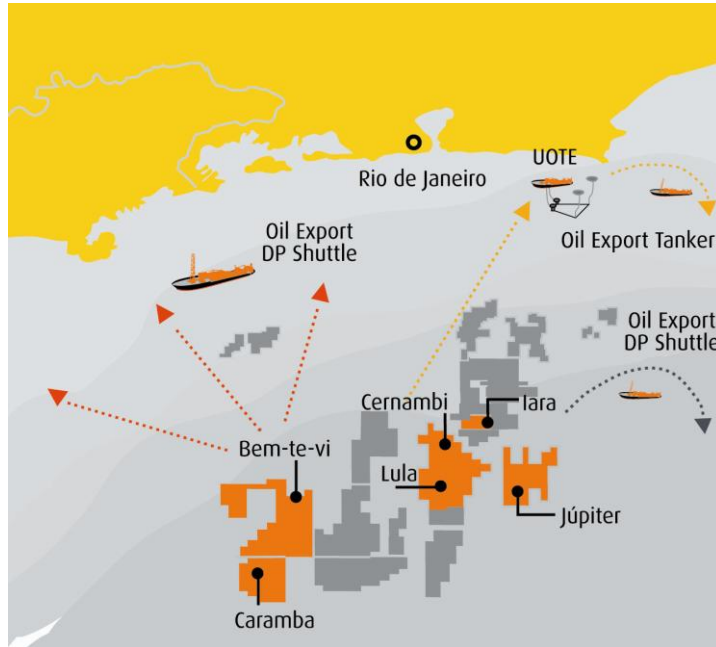
Lula/Cernambi production profile¹ (kboepd)



- Galp Energia production forecast assumes current FPSO contracting strategy implemented
- Total of 160 wells (production and injectors) to be executed for the full development
- Average flow rate per well of 20 kboepd

Several options being studied for oil export from Santos basin

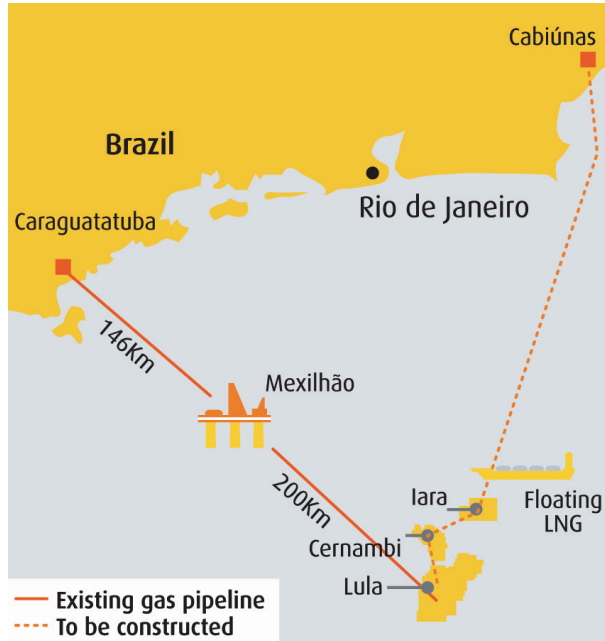
Oil export solutions



- Oil export solutions/infrastructure to be implemented in parallel with production capacity ramp-up
- Before 2013: oil export via DP shuttle tankers
- After 2013: oil export via shallow water transshipment unit (UOTE)
- Technical alternatives to UOTE are also under study

Gas export solutions being evaluated

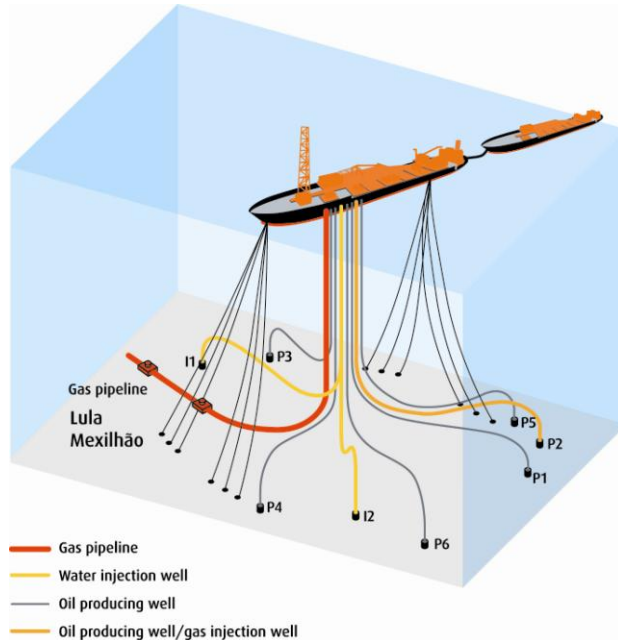
Gas export solutions



- Gas export solutions/infrastructure to be implemented in parallel with production capacity ramp-up
- Already installed: gas export via Mexilhão (10 M³/d capacity) sufficient for three FPSO
- After 2014: gas export via Cabiúnas (13 M³/d capacity)
- Beyond 2016: FLNG or incremental gas pipeline solution (under evaluation)

First commercial project in Lula/Cernambi field of a total of nine FPSO

Lula pilot project



- Cidade de Angra dos Reis FPSO with a 100 kbopd capacity in operation since October 2010
- Three production wells and one injector well connected until the end of 2011, with an expected production at the YE 2011 of 60 kboepd
- Three additional production wells and two injector wells to be connected in 2012
- Possibility of interconnection of more wells to maintain the FPSO production level will be considered in 2013

Pre-salt projects main optimization triggers

Main optimization triggers	Solutions under evaluation
Maximize hydrocarbon recovery	Enhanced oil recovery (WAG HC, WAG CO ₂)
Cost reduction in wells construction and operation	Drilling performance improvements; well number and location optimization; directional and big bore wells implementation
Optimization of fluid elevation and processing	Specification of special materials (CO ₂ and H ₂ S resistant)
Flow assurance (high WAT)	Thermal isolated or electrical-heated pipeline, wax inhibitor specification
Produced CO ₂ destination	WAG CO ₂ ; CO ₂ separation/sequestration technology

Acronyms

#	Number	HR	Human Resources
\$	United States dollar	IOC	International Oil Company
%	Percentage	IPO	Initial Public Offering
2D	Two dimensional seismic	Kboepd	Thousand barrels of oil equivalent per day
3D	Three dimensional seismic	Kbopd	Thousand barrels of oil per day
ANP	Brazilian agency for oil, natural gas and biofuels	Km	Kilometre
API gravity	American Petroleum Institute gravity	Km ²	Square kilometre
BB	Benguela and Belize	LLI	Long Lead Item
BBLT	Benguela, Belize, Lobito, and Tomboco	LNG	Liquified Natural Gas
Bcm	Billion cubic metres	LT	Lobito Tomboco
Bln	Billion	M ³ /d	Million cubic metre per day
Boe	Barrel of oil equivalent	Mln	Million
c.	Circa	MW	MegaWatt
CAGR	Compound Annual Growth Rate	NG	Natural Gas
CSEM	Control Source of Electromagnetic Method	NOC	National Oil Company
CO ₂	Carbone Dioxide	p.p.	Percentage point
CPT	Compliant Piled Tower	R&M	Refining & Marketing
E&P	Exploration & Production	RCA	Replacement Cost adjusted
EPC	Engineering, Procurement and Construction	TL	Tômbua-Lândana
EWT	Extended Well Test	Ton	Tonne
FLNG	Floating Liquified Natural Gas	TS	Tômbua South
FPSO	Floating Production Storage Offloading	UOTE	Oil Transhipment Unit
G&P	Gas & Power	WAG	Water-alterning-gas
GWh	GigaWatt hour	WAT	Wax appearance temperature
H ₂ S	Hydrogen sulfide	WI	Working interest
HC	Hydrocarbon	YE	Year End

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Financial outlook figures are RCA figures except otherwise noted.

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