Delivering world class development projects
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Head of Exploration & Production
A focused E&P strategy

Resources and targets

High potential exploration assets

Delivering world class development projects
Development options being analysed according to SEE approach

- Distance to onshore just 40 km
- Multi-train LNG train development scenarios are being developed
- Unitisation discussions with area 1 shall take place in near future
- Flow rates expected to be up to 4 Mln m³/d (150 mmscf/d) during production phase
- High quality reservoir enhances flow and recovery rates, with impact on capex needs
Development concept solutions being studied

Natural gas development options

- Onshore processing plant
- Offshore processing platform
- Offshore processing platform
- Pipeline
- Gas directly from producing well
- Onshore gas processing plant
- Liquefaction plant
- LNG shipping
- Onshore liquefaction unit
- Pipeline
- Offshore processing platform
- Liquefaction plant
- LNG shipping
- Onshore liquefaction unit
- Pipeline
- Gas directly from producing well
- FLNG
- LNG shipping
- Offshore liquefaction unit
Location near interesting LNG consumption markets

- Global LNG market expected to double to c.400 Mtpa in 2020
- Interesting geographical location to target the growing demand from Asian market
- Leverage on partners and in-house Angolan and Brazilian experience to develop and market natural gas
- Gas commercial production expected to start by 2018
Pre-salt province revealed key success characteristics

- Galp Energia benefited from being within the first movers into the pre-salt area
- Seven discoveries within pre-salt layer in four blocks
- Presence since 2000 starting to materialize
- Significant upside potential from forthcoming appraisal and development activities
Potentially material appraisal activity underway in Júpiter

- Gross 3C contingent resources above 5 bln boe\(^1\), of which 1/3 oil, 1/3 condensates and 1/3 natural gas
- High CO\(_2\) content and to be studied by Jupiter NE appraisal well
- EWT in Júpiter area expected for 2015
- Expected DoC until February 2016

\(^1\) Source: DeGolyer and MacNaughton @ 31/12/2011
CO₂ monetization as a potential upside

- Enhanced oil recovery through CO₂ injection in carbonate reservoirs proved to improve recovery efficiencies
- Opportunity to act as a regional supplier of CO₂ to pre-salt clusters to EOR development
- Pre-salt facilities (Subsea and Surface) are being designed with flexibility to import gas and to perform CO₂ injection
Júpiter development is viable and with material upside

Júpiter resources development

- Worst case: Development of oil rim (without oil upside potential)
- Base case: Development of oil rim and gas cap (without oil upside potential)
- Best case: Development of oil rim (with oil upside) and gas cap with monetization of CO₂
Appraisal activities confirmed Iara’s potential

- Two wells drilled so far found a reservoir of oil with high quality
- Reservoir rocks composed of microbial carbonates from sag and rift sections
- Formation tests on Iara Horst registered good quality data
- 3-4 bln boe with upside potential
Drilling performance with high angle wells encourages application in Iara

Drilling optimization

- Potential upside through multi-lateral and horizontal drilling on development phase in a cost effective manner
- Technology being tested currently in Lula field
- Potential for upward revision of recoverable resources
Development of Iara being studied

- Iara West currently being drilled with results expected during 2Q12 targeting a structure with potentially better reservoir characteristics
- Intensive activity gathering information to prepare the development plan
- EWT planned in the sequence of Iara West results
- Expected DoC by December 2013
Lula/Cernambi project has been a successful journey

- BM-5-11 awarded
- Tupi discovery
- Iracema discovery
- First EWT
- First oil from 1st pilot FPSO
- Lula/Cernambi DoC
- First international oil sale
- First gas commercialization

2000
2006
2009
2010
2011
2012 and beyond
Significant progress achieved in 2011

- Appraisal activity during 2011 revealed better reservoir characteristics than initially expected
- Initial flow capacity above expectations
- EWT in Lula NE confirmed the productivity achieved in previous tests
- Currently performing the 1st EWT in Cernambi South area
Fast development of a world-class project

Lula-1 project

- Lula – 1 project to reach full capacity in March
- Four producing wells and one gas injection well to be in place at the end of March
- Two WAG injection wells to be connected to FPSO Cidade de Angra dos Reis in 2012
- Ready to connect highly deviated well (P8H) in 2013
Infrastructure secured to support project development

- 2nd and 3rd production units being converted and expected to be on stream by 2Q13 and 2014 respectively
- Works for the deployment of the six hulls already started at Rio Grande shipyard
- FPSO deliveries on time to support the fast development of Lula/Cernambi project
- Six rigs permanently allocated to BM-S-11 by YE2011
Lula/Cernambi production of c.1,500 kboepd in 2020

- Production profile based on current technological achievements
- Better reservoir characteristics allowed the upwards revision of production target
- Knowledge acquired with Lula-1 will be key in accelerating the development of subsequent producing units
Significant and reachable upside potential on Lula/Cernambi project

- WAG alternative ready to be tested in Lula-1 from 2012 onwards
- Each 1 p.p. increase in recovery factor results in an incremental c.300 Mboe of recoverable volumes
- Potential for further capacity debottlenecking through sub-sea equipments
- Potential for further economies of scale
Angola is currently a development story

- Presence in Angola rewarded with 26 discoveries
- Three fields already under production: Kuito, BBLT and Tômbua-Lândana
- Current projects already reached peak production
- Further production increase will be driven by new projects already identified
Five areas still to be developed

- Kuito, BBLT and Tômbua-Lândana reaching mature phase
- Lianzi, Malange and Lucapa first oil expected to occur between 2014 and 2017
- Development scenarios based on both tie-backs and new FPSO production unit
- World-class technical breakthroughs: Congo river crossing gas export project and Lianzi DEH flowlines application
From exploration success into development stage

Blocks 32/33

- First oil expected by 2016
- Two FPSO expected to be in place by 2017 with an aggregated capacity of c.200 kbopd
- 14 discoveries and 12 development areas identified
- Going ahead with the evaluation programme in block 33
Development of world class projects on track to achieve 300 kboepd by 2020

- Mozambique development project being studied with first gas expected by 2018
- Brazil gaining momentum and driving production growth
- Significant upside through testing different techniques in pre-salt Santos basin
- Angola development projects being prepared to support production increase
## Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>#</td>
<td>Number</td>
</tr>
<tr>
<td>$</td>
<td>United States dollar</td>
</tr>
<tr>
<td>%</td>
<td>Percentage</td>
</tr>
<tr>
<td>2D</td>
<td>Two dimensional seismic</td>
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<tr>
<td>3D</td>
<td>Three dimensional seismic</td>
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<tr>
<td>API gravity</td>
<td>American Petroleum Institute gravity</td>
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<tr>
<td>BBLT</td>
<td>Benguela, Belize, Lobito, and Tomboco</td>
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<tr>
<td>Bbl</td>
<td>Barrel</td>
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<tr>
<td>Bcm</td>
<td>Billion cubic metres</td>
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<tr>
<td>Bln</td>
<td>Billion</td>
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<tr>
<td>Boe</td>
<td>Barrel of oil equivalent</td>
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<td>c.</td>
<td>Circa</td>
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<tr>
<td>CAGR</td>
<td>Compound Annual Growth Rate</td>
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<tr>
<td>Capex</td>
<td>Capital expenditure</td>
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<td>CO₂</td>
<td>Carbon Dioxide</td>
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<td>DA</td>
<td>Development area</td>
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<td>DEH</td>
<td>Direct electrical heating</td>
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<td>DoC</td>
<td>Declaration of commerciality</td>
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<td>E/A</td>
<td>Exploration well /Appraisal well</td>
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<td>E&amp;P</td>
<td>Exploration &amp; Production</td>
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<tr>
<td>EBITDA</td>
<td>Earnings before interest, taxes, depreciation and amortization</td>
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<tr>
<td>EOR</td>
<td>Enhanced oil recovery</td>
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<td>EWT</td>
<td>Extended Well Test</td>
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<td>FLNG</td>
<td>Floating liquefied natural gas</td>
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<tr>
<td>FPSO</td>
<td>Floating Production Storage Offloading</td>
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<tr>
<td>GWh</td>
<td>GigaWatt hour</td>
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<td>HSE</td>
<td>Health, Safety and Environment</td>
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<td>IPO</td>
<td>Initial Public Offering</td>
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<tr>
<td>Kboepd</td>
<td>Thousand barrels of oil equivalent per day</td>
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<tr>
<td>Kbpd</td>
<td>Thousand barrels per day</td>
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<td>Km²</td>
<td>Square kilometre</td>
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<td>LNG</td>
<td>Liquified Natural Gas</td>
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<td>LTIFR</td>
<td>Lost time injury frequency rate</td>
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<td>Mln</td>
<td>Million</td>
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<tr>
<td>MW</td>
<td>MegaWatt</td>
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<tr>
<td>Mmscf/d</td>
<td>Million standard cubic feet per day</td>
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<td>NG</td>
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<td>OWC</td>
<td>Oil-water contact</td>
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<td>Probability of success</td>
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<td>Replacement Cost adjusted</td>
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<td>Sustainable Asset Management</td>
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<td>SEE</td>
<td>Social, Environmental and Economic impact</td>
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<td>SXEP</td>
<td>STOXX Europe 600 Oil &amp; Gas</td>
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<tr>
<td>Tcf</td>
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<tr>
<td>Ton</td>
<td>Tonne</td>
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<td>WAG</td>
<td>Water Alternating Gas</td>
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<td>WI</td>
<td>Working interest</td>
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<td>YE</td>
<td>Year End</td>
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Disclaimer

Financial outlook figures are RCA figures except otherwise noted.

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