After the Dawn

Growth opportunities in the upstream segment

- We recommend buying Galp Energia given our FY12 target price of €15.17 per share, corresponding to an overall return of 23% given current price levels.

- The company’s focus in the upstream segment (E&P) is more than justified as a result of current discoveries in Brazil and Mozambique. With the expected increase in demand of oil and natural gas, the strategy shift towards E&P strengthens Galp Energia’s growing opportunities. Although debatable, the partnership with Sinopec is perceived as positive, reducing many financing needs.

- Developments in the R&M segment suggest a slowdown in the segment. Overall lower refining margins and projected negative conditions for the following years imply a lower value. Fortunately, the completion of the conversion project by 2012 greatly improves competitiveness given Europe’s preference for middle distillates.

- Despite suffering slightly due to the lower growth expectations in the Iberian market, the G&P segment remains fairly stable. Possibility of selling part of the regulatory asset base was postponed as the company managed to establish a partnership with Sinopec, increasing capital by $4.8 billion.

Company description

Galp Energia operates under the energy sector, with activities in three different segments: Exploration & Production (E&P); Refining and Marketing (R&M); Gas and Power (G&P). With a current focus on the upstream segment, Galp is pursuing major developments in Brazil. Investment in the conversion project reinforced R&M competitiveness and potential. With a large portion of regulated activities in G&P, Galp Energia comprises and highly valued portfolio of operations.
Table of Contents

VALUATION ........................................................................................................ 3

SENSITIVITY ANALYSIS .................................................................................. 6

COMPANY OVERVIEW ....................................................................................... 7

  COMPANY DESCRIPTION ............................................................................... 7
  SHAREHOLDER STRUCTURE ....................................................................... 8

EXPLORATION & PRODUCTION ....................................................................... 9

  MARKET OVERVIEW .................................................................................... 9
  BRAZIL ............................................................................................................ 11
  ANGOLA ......................................................................................................... 14
  MOZAMBIQUE & OTHERS .......................................................................... 15
  VALUATION .................................................................................................. 16

REFINING & MARKETING ............................................................................... 17

  MARKET OVERVIEW .................................................................................... 17
  REFINING ....................................................................................................... 19
  MARKETING .................................................................................................. 20
  VALUATION .................................................................................................. 22

GAS & POWER .................................................................................................. 22

  MARKET OVERVIEW .................................................................................... 22
  LIBERALISED NG ........................................................................................ 23
  REGULATED NG ........................................................................................... 25
  VALUATION .................................................................................................. 26
  POWER ............................................................................................................ 27
  VALUATION .................................................................................................. 28

FINANCIALS ....................................................................................................... 28

ALTERNATIVE SCENARIO ................................................................................. 29

  SCENARIO OVERVIEW ............................................................................... 29
  EFFECT ON GALP ENERGIA ...................................................................... 31

APPENDIX .......................................................................................................... 33

  APPENDIX 1: COMPARABLES .................................................................... 33
  APPENDIX 2: TRANSACTIONS .................................................................... 34
  APPENDIX 3: EUROPEAN FUEL PRICES ................................................... 35
  APPENDIX 4: OECD SOVEREIGN DEBT AND DEFICIT ......................... 36

FINANCIAL STATEMENTS ............................................................................... 37

  RESEARCH RECOMMENDATIONS ............................................................... 39
Valuation

We value Galp Energia through a Sum-of-the-parts (SOTP) approach in which we analyse each segment in detail. To further complement this analysis, we formulate two possible scenarios: the base scenario where each segment is valued in accordance to the most probable evolution of its value drivers; the worse scenario in which we attempt to address the impact caused by Portugal’s exit from the Euro, followed by recession. The later scenario is attributed a 5% probability given our personal beliefs about the sovereign debt crisis and it should be regarded as a perception of the major risks associated with Galp Energia’s operations. Valuation of the E&P segment was achieved through an appraisal of the core extraction fields (or blocks) in which Galp Energia operates. We relied on an adjusted present value (APV) model to take into account both unlevered financial cash flows that were discounted at the unlevered cost of equity and the tax shield/bankruptcy costs which were discounted at the cost of debt. This method is more appropriate than existing alternatives since the capital structure associated with such projects is not constant over time. Moreover, the level of debt existing in comparable projects allows us to fairly project interest payments over the project’s life. Despite several uncertainties one can reach a plausible assessment of such fields by having access to the amount of recoverable reserves. Based on the level of reserves, one begins by estimating the necessary extraction rate to meet the average life time of 25 years per field. Given the extraction rate of the equipment required in such operations (i.e.: FPSOs1, wells, pipes, drills, maintenance) and released information on the projected plan for certain fields, we formulate an opinion on the number of FPSOs and wells that have to be acquired, providing a solid idea of future capital expenditures and production. Through an application of an average rate of decay in extraction after reaching peak production2, we tune the overall estimation. Based on lifting cost forecasts and F&D3 costs we determine both operational costs and D&A4. After considering the existing taxation and determining average levels of working capital (which aren’t very significant in the E&P activity), we achieve overall cash flow. Bankruptcy costs in this activity were not estimated due to the complexity of

---

1 Floating Production Storage and Offloading.
3 Finding and Development costs – All costs incurred until the beginning of the extraction process.
4 Depreciation and amortization – includes both depreciation of equipment and reserves. Reserves are accounted according to F&D costs and are depreciated in accordance to the percentage of extracted reserves.
Probability of bankruptcy in the E&P segment is practically nonexistent given the current capital increase by Sinopec and the company’s ability to sell its holdings.

R&M and G&P were valued through a WACC model with a 10 year implicit period (from 2011-2020).

Each activity was judged in accordance to specific value drivers.

Cost of capital was determined by unlevering the beta of comparables. Cost of debt was computed as a function of market yields on similar rated companies, along with historical probabilities of default and recovery rates.

its estimation and the low probability of default. Due to the globalism of oil markets, upstream activities have shown great resilience and the current capital increase by Sinopec further reduced the chances of such event. Alternative segments were valued through a WACC model based on a 10 year implicit period and a final terminal value achieved through assumptions on the ability to attain real growth. R&M was analysed separately by taking into consideration particular key drivers: refining margins, utilization rates and future policies were essential at determining the value of refining activity, while marketing based itself on expectations of economic growth and disposable income. Finally, the G&P segment was split into regulated activities under the Natural Gas (NG) sector, liberalized commercialization and power. The liberalized activity depends highly on future operating margins and total sales; the regulated activity is mostly based on future regulatory actions and the power segment was assessed through an analysis of megawatt production capacity. The computation of the cost of capital was achieved through a compilation of comparables for each segment (appendix 1). This information allowed us to compute the average unlevered beta for each of the segments, followed by the leveraging under Galp Energia’s market debt-to-equity ratio. The levered cost of equity was determined through the application of the CAPM model under a 6% market premium, in accordance with relevant financial literature. Cost of debt consists on the effective interest rate, and it was achieved based on the market yield of comparables with similar rating and historical default rates/recovery rates. Since Galp Energia does not possess rating we relied on the current market perception of companies such as Portugal Telecom and EDP, granting Galp Energia a similar BBB rating. Due to the assumptions of the CAPM model, only systematic risk should be present in the cost of capital. As such, when evaluating country risk we determined the beta for each country based on the country’s market index or a proper comparable.

Finally, since all of our cash flows are denominated in EUR, we used the German 10y Treasury bond as a proxy for the risk-free rate. These cash flows were

\[ WACC = \frac{D}{E+D} \times r_d \times (1 - t) + \frac{E}{E+D} \times r_e \]

\[ \text{Capital Asset Pricing Model – Only the systemic risk is relevant since everything else can be diversified. The required rate of return follows the expression: } E[R_i] = R_f + \beta_i(E[R_m] - R_f) \text{ where systemic risk is represented by beta.} \]


\[ r_d = y \times (1 - P_d) - (1 - RR) \times P_d, \ y \text{ denotes the market yield, } P_d \text{ denotes de probability of default and } RR \text{ the recovery rate. } P_d \text{ for Galp Energia is 4.52% given the probabilities associated with BBB and BB rated bonds. The recovery rate is 70.73% which constitutes an average weighted by the recovery rate of bank loans and bonds.} \]


\[ \beta_i = \frac{\sigma_{i,global}}{\sigma_{Global}} \beta_{Global}. \text{ The S&P1200 Global was used a proxy for the global market and the correlation is assumed to be one since under periods of recession correlations tend to increase.} \]
converted based on forward exchange rates up until 2035. All rates are presented in nominal terms (including the terminal growth rate) with an implicit long-term inflation rate of 2%.

**Figure 1: Discount rates and terminal growth**

<table>
<thead>
<tr>
<th>Risk Free</th>
<th>Country Risk</th>
<th>$E[Rm]$</th>
<th>$\beta_u$</th>
<th>$\beta_l$</th>
<th>$r_c$</th>
<th>$r_y$</th>
<th>$r_d$</th>
<th>D/E</th>
<th>WACC</th>
<th>g</th>
</tr>
</thead>
<tbody>
<tr>
<td>E&amp;P</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brazil</td>
<td>2.19%</td>
<td>5.63%</td>
<td>6.00%</td>
<td>1.262</td>
<td>34.0%</td>
<td>1.553</td>
<td>15.39%</td>
<td>N/A</td>
<td>4.39%</td>
<td>4.21%</td>
</tr>
<tr>
<td>Angola</td>
<td>2.19%</td>
<td>5.98%</td>
<td>6.00%</td>
<td>1.262</td>
<td>50.0%</td>
<td>1.482</td>
<td>15.74%</td>
<td>N/A</td>
<td>4.39%</td>
<td>4.21%</td>
</tr>
<tr>
<td>Mozambique</td>
<td>2.19%</td>
<td>5.98%</td>
<td>6.00%</td>
<td>1.262</td>
<td>32.0%</td>
<td>1.562</td>
<td>15.74%</td>
<td>N/A</td>
<td>4.39%</td>
<td>4.21%</td>
</tr>
<tr>
<td>Refining</td>
<td>2.19%</td>
<td>2.69%</td>
<td>6.00%</td>
<td>0.911</td>
<td>26.5%</td>
<td>1.514</td>
<td>10.35%</td>
<td>13.97%</td>
<td>6.52%</td>
<td>4.96%</td>
</tr>
<tr>
<td>Marketing</td>
<td>2.19%</td>
<td>2.85%</td>
<td>6.00%</td>
<td>0.911</td>
<td>26.5%</td>
<td>1.514</td>
<td>10.51%</td>
<td>14.13%</td>
<td>6.52%</td>
<td>4.96%</td>
</tr>
<tr>
<td>Gas Regulated</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gas Liberalised</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power</td>
<td>2.19%</td>
<td>2.69%</td>
<td>6.00%</td>
<td>0.374</td>
<td>26.5%</td>
<td>0.621</td>
<td>7.12%</td>
<td>8.61%</td>
<td>6.52%</td>
<td>4.96%</td>
</tr>
</tbody>
</table>

Source: Analyst estimates

After achieving the enterprise value for each area, we subtracted all non-equity claims in order to obtain the market capitalization of Galp Energia. Such claims include interest bearing debt (at market value), pension shortfalls and minorities. Book value of interest bearing debt was determined based on expectations over total assets and equity. With the book value of debt, the interest expenses and the average maturity of debt, we determined the debt’s market value\(^{10}\). Pension shortfalls were estimated in accordance with Galp Energia’s forecast and historical data. Minorities consist in portions of our assets held by others which were valued as a percentage of attained enterprise value.

![Table 1: Fair value of Galp Energia](image)

<table>
<thead>
<tr>
<th></th>
<th>Base Scenario (P=95%)</th>
<th>Worst Scenario (P=5%)</th>
<th>Expected Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fair Value € per Share</td>
<td>Fair Value € per Share</td>
<td>Fair Value € per Share</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E&amp;P</td>
<td>14,361.82 €</td>
<td>17.32 €</td>
<td>11,670.18 €</td>
</tr>
<tr>
<td>R&amp;M</td>
<td>3,477.67 €</td>
<td>4.19 €</td>
<td>2,114.80 €</td>
</tr>
<tr>
<td>G&amp;P</td>
<td>3,208.78 €</td>
<td>3.87 €</td>
<td>2,569.08 €</td>
</tr>
<tr>
<td>Net Debt FY11e</td>
<td>3,821.89 €</td>
<td>4.61 €</td>
<td>3,811.13 €</td>
</tr>
<tr>
<td>Pension Fund and Health Care FY12e</td>
<td>301.57 €</td>
<td>0.36 €</td>
<td>299.23 €</td>
</tr>
<tr>
<td>Minorities FY12e</td>
<td>4,149.27 €</td>
<td>5.00 €</td>
<td>3,984.35 €</td>
</tr>
<tr>
<td>Sinopec</td>
<td>3,832.11 €</td>
<td>4.62 €</td>
<td>3,095.52 €</td>
</tr>
<tr>
<td>Beirágis</td>
<td>26.00 €</td>
<td>0.03 €</td>
<td>24.64 €</td>
</tr>
<tr>
<td>Lusitaniágos</td>
<td>48.93 €</td>
<td>0.11 €</td>
<td>46.37 €</td>
</tr>
<tr>
<td>Setgíd</td>
<td>94.50 €</td>
<td>0.11 €</td>
<td>89.56 €</td>
</tr>
<tr>
<td>Togqás</td>
<td>52.06 €</td>
<td>0.06 €</td>
<td>49.33 €</td>
</tr>
<tr>
<td>Power Wind</td>
<td>95.66 €</td>
<td>0.12 €</td>
<td>78.92 €</td>
</tr>
<tr>
<td>Total</td>
<td>12,774.94 €</td>
<td>15.41 €</td>
<td>8,859.31 €</td>
</tr>
</tbody>
</table>

Source: Analyst estimates

\(^{10}\) The market value of debt was determined as: 

\[ E[Market\ debt] = Interest\ expenses \times \left(1 - \frac{1}{(1+y)^T}\right) + \frac{Book\ debt}{1+y}, \]

where \( y \) denotes the market yield and \( T \) the average maturity.
Sensitivity Analysis

Given the inherent uncertainties in any possible valuation, sensitivity analysis is extremely useful in understanding the effect of wrongful estimation. Galp Energia’s activity is strongly reliant on future exchange rates (€/USD) along with Brent price movements. Since we considered a series of Brent prices over the next years, we performed an analysis through an overall % increase of the base scenario. The sensitivity range was selected in accordance with either the past average growth rates, the standard deviation of growth rates or a particular individual expectation. Both the exchange rate and Brent prices have a significant impact on the share price. Since many products are priced and traded in dollars, a decrease in the rate implies a depreciation of the euro, and dollar results now yield greater value in Euros. Brent prices seem to display a positive relationship given the weight of the E&P segment and the ability to transfer refining costs onto customers.

Furthermore, due to the importance of the discount rate that is used to discount all future cash flows, measuring the impact of possible miss estimations is crucial. For this purpose we increased the relevant discount/growth rates by a certain percentage (i.e.: 1% corresponds to a movement from 9% to 10% in the rate). We conclude that share prices could vary between €15.80 and €14.69, displaying a certain resistance at mistakes ranging around 1%.

Related to the operational activity, we analysed the impact of the utilization rate and the refining margin on the R&M segment. The refining margin has proved to be much more volatile, with variations of 30% in certain years. Large changes in the margin impact the price significantly since the company requires a decent margin to cover fixed costs, salaries and other costs.

Finally, to perceive the implication of regulation risk we varied the possible remuneration rates for both the storage and distribution of natural gas. The results were fairly predictable given the small size of the segment. Little change occurs to the value of Galp Energia removing us from any in-depth analysis of regulatory behaviour when estimating future remuneration rates.
Company overview

Company description

Galp Energia was founded in April 1999 with the purpose of operating in the oil and natural gas business. The company originated from the merger between Petróleos de Portugal (Petrogal) and Gás de Portugal (GDP), caused by the restructuring of the Portuguese energy sector. It currently operates under three different segments: Exploration & Production (E&P), Refining & Marketing (R&M) and Gas & Power (G&P).

Despite its foundation in the downstream sector it expanded to the upstream sector, with E&P of petroleum and natural gas across 43 worldwide projects. It is present in 8 countries but operations are mostly focused in Africa and Brazil. Production began in Angola and expanded to Brazil as a result of the major findings in the Lula (Tupi) field. Most investments and findings occurred in these locations, with the exception of Mozambique where a giant gas discovery took place. With up to 7.5 Tcf of natural gas, Mozambique quickly became a priority and front end activities are already being taken by the field’s operator (Eni). E&P is regarded as the segment with the highest growth opportunities, allowing the company to profit from the continuous increase in oil prices. Moreover, it hedges Galp Energia’s refining operations against price movements and diversifies many of the regional risks adjacent to the Iberian market (mainly the current European sovereign debt crisis). The decision to focus its strategy in this segment was influenced by highly renowned integrated companies (i.e.: Total, Chevron, BP, Shell) which demonstrated high profitability. Moreover, the company’s downstream operations facilitated its entry into E&P.

Refining takes place in Portugal in the Sines and the Matosinhos refineries. The Sines refinery is capable of processing 220kbb/d and Matosinhos 90kbb/d. The average worldwide capacity in the refining industry is 140kbb/d, implying that the Sines refinery is significantly bigger than the average, while Matosinhos is smaller. Both refineries have been subject to a conversion project that converts heavier crude oil into medium and light distillates and further boosts capacity by 20kbb/d. The conversion project has been completed in Matosinhos (July 2011) and Sines is expected to complete on the 2nd quarter of 2012. Marketing is comprised by retail and wholesale of refined products throughout the Iberian Peninsula, taking advantage of Galp Energia’s major logistics network. Expansion to African markets has proven to be wise, with apparent growth.

<table>
<thead>
<tr>
<th>Region</th>
<th># of Refineries</th>
<th>Average Capacity (kbb/d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>42</td>
<td>79.73</td>
</tr>
<tr>
<td>Asia</td>
<td>151</td>
<td>175.82</td>
</tr>
<tr>
<td>Europe</td>
<td>148</td>
<td>152.49</td>
</tr>
<tr>
<td>North America</td>
<td>185</td>
<td>128.01</td>
</tr>
<tr>
<td>South America</td>
<td>58</td>
<td>113.50</td>
</tr>
<tr>
<td>Oceania</td>
<td>10</td>
<td>99.00</td>
</tr>
<tr>
<td>World</td>
<td>594</td>
<td>140.94</td>
</tr>
</tbody>
</table>

Source: Galp Energia

Source: Oil&Gas Journal

Source: Galp Energia

Figure 7: Galp Energia segmentation

Figure 8: Refineries across the world (2011)

Figure 9: Natural gas activity
The Gas segment contains liberalised and regulated activities. Regulation focuses mainly in the distribution and storage of natural gas while supply is fully liberalised. Commercialization is both regulated and liberalized with market deregulation taking place up until 2013. The Power segment is by far the smallest portion of Galp, with a cogeneration capacity of 160MW. This shall be increased by 80MW with the completion of Matosinhos cogeneration facility. Galp is also participating in the wind power generation through an increase in a project which is expected to boost capacity by 200MW along with participation in Vale Grande.

Shareholder structure

Amorim Energia and Eni each hold 33.34% of total shares, representing the main shareholders of Galp Energia. The Portuguese State holds a total of 8%, 7% directly through Parpública and 1% indirectly through Caixa Geral de Depósitos (CGD). The remaining 25.32% constitute Free-Float which has been listed for trading on Euronext Lisbon since 23 October 2006.

Until 31 December 2014 Amorim Energia, Eni and CGD are included in a shareholder agreement, which establishes a set of aspects related to the terms for disposal of the shares they hold. The agreement covered the parties’ obligation to keep their holdings for a lock-in period and each party may only sell its holdings in a single tranche. During 2011 Eni expressed its intention of selling its position. This did not come to occur due to the aggravation of the Portuguese political crises and the failure at negotiation with Petrobras (that only wished to acquire 25% and not the entire 33.34%). As a result, Eni declared it had no rush on selling its position but maintains its negotiations with interested parties.

On a different note, Sonangol displayed interest in increasing its participation in Galp Energia. This did not take place due to difficult negotiations and political issues, in which the Portuguese government opposed a predominant position held by Angolan entities. Currently, the Angolan indirect participation is achieved through a 45% holding in Amorim Energia named Esperanza. The stakeholders of this holding are Sonangol and Isabel dos Santos.

Until the end of 2011 CGD will be selling its holdings according to the Portuguese budgeting strategy but no further information on potential buyers has been released. Discussions between Amorin, Eni and CGD regarding the selection of administration yielded no results and the position of chairman still hasn’t been filled.
Exploration & Production

Market Overview

Ever since mankind developed society as we know it energy became one of the most indispensible goods in sustaining and offering proper living conditions. Over time demand for energy has consistently grown, displaying a tight connection with economic growth\(^1\) (US economy displays a 93.4% correlation between GDP and energy consumption). It is without surprise that developed economies display much higher energy consumption than the opposed developing economies. Since 2000 developing economies began exhibiting higher real GDP growth than advanced economies which boosted energy requirements in these countries. Future expectations of economic growth are positive, mostly fueled by developing economies such as China, India, Middle East and Latin America. According to OPEC\(^2\) this growth results in an annual energy demand increase of 1.6%, leading world energy demand from 235.4 Mboe/d\(^3\) in 2010 to 355.9 Mboe/d in 2035. Out of this amount, approximately 82% of energy demand in 2035 will correspond to fossil fuels.

Oil demand grows at a slower rate of 0.95%, going from 86.8Mb/d\(^4\) in 2010 to 109.7Mb/d in 2035. Other sources of energy include coal (1.6% p.a.\(^5\)), gas (2% p.a.), nuclear (1.7% p.a.), hydro (2.3% p.a.), biomass (3.3% p.a.) and other renewables (7.5% p.a.). Despite the overall positive growth in demand, developed economies are expected to reduce their oil demand from 46.1Mb/d to 41.9Mb/d (offset by an increase of 27.1Mb/d in developing and transitioning economies). Although debatable, the reduction in oil consumption can easily be understood when we analyze the major sectors in which oil is used.

Sectors include road transportation, aviation, petrochemicals, industry, electricity generation and others. As expected, road transportation is the sector which contributes the most towards oil needs. Due to assumed technological improvements in transportation and a saturation effect that has become apparent in developed countries, the need for oil products mostly in Europe and North

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\(^2\) OPEC. November 2011. “World Oil Outlook 2011”.

\(^3\) Million barrels of oil equivalent per day (standardized measure of energy).

\(^4\) Million barrels of oil.

\(^5\) Annual growth rate.
America is diminishing. Vehicles are evermore capable of covering larger distances with lower amounts of fuel\(^{16}\). Moreover, research into hybrid and plug-in vehicles, electric vehicles and hydrogen fuel cells further support this result. Other sectors in developed economies either display a similar tendency of less oil dependency or stable oil requirements. Developing countries benefit from the same efficiency improvements but do not suffer from the saturation effect. Per capita measures indicate that most developing regions display less than 40 cars per 1000 people, contrasting with over 400 cars per 1000 people in developed regions. As a result, a major increase in cars is expected, following a huge requirement for oil products. Similarly, other sectors are also growing and energy is demanded. To face this increase in demand, several projects are expected to take place and oil supply is projected to increase through both conventional and unconventional sources. According to OPEC a total of €110B of investment in upstream will be required from 2011 to 2015 in order to sustain the increase in demand. This figure increases over time as we approach our 2035 target. Globally, oil supply is expected to grow from 86.4Mb/d in 2010 to 109.9Mb/d in 2035, slightly below oil demand levels for most of the period.

Price expectations result from demand and supply equilibrium. In the past oil prices displayed less volatility and much of their evolution was explained through fundamentals. Since investors began speculating on its value (mid 2006), volatility vastly increased. Based on an historical power trend, which strongly explains price developments prior to 2007, we conclude that today’s crude prices should be close to 95$/bbl (represented in Graph 5). With the increase in volatility and the major fall in prices during 2008, many companies rethought their investments in the upstream segment. As oil prices moved upwards, investment returned to its normal trend but much of the increased production meant to be installed in 2009 was postponed, reducing current levels of production.

The overall increase in oil demand combined with the postponement of upstream investment strongly justifies Galp Energia’s presence in the Exploration and Production segment, across 8 countries and with a total of 48 projects. Production only takes place in Angola and Brazil characterizing them as core areas of Galp Energia’s strategy. The company’s main goal is to reach a production of 70kboepd\textsuperscript{17} by 2015 and 300kboepd by 2020 (contrasting with its previous goal of 200kboepd). This goal represents nothing more than the company’s wish to increase its upstream operations and it has continuously been revised upwards with new discoveries.

Brazil

Galp Energia’s presence in Brazil is separated between onshore and offshore exploration. It participates in a total of 21 projects spread across 8 basins. Offshore basins include Potiguar, Santos, Espírito Santo, Pernambuco, Campos while onshore basins are Potiguar, Sergipe/Alagoas and Amazonas. Petrobras is the operator in most of the fields with Sergipe being the only exception. Out of all basins, the Santos basin is the only producing region while most others are still in the pre-exploration and exploration phases with no information regarding potential reserves. Due to this, our valuation will only focus on the Santos Basin on a block by block approach.

<table>
<thead>
<tr>
<th>Brazil</th>
<th># blocks</th>
<th>% Galp Energia</th>
<th>Operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offshore</td>
<td>Potiguar</td>
<td>5</td>
<td>20%</td>
</tr>
<tr>
<td>Santos</td>
<td>4</td>
<td>10-20%</td>
<td>Petrobras</td>
</tr>
<tr>
<td>BM-S-8</td>
<td>14%</td>
<td>Petrobras</td>
<td></td>
</tr>
<tr>
<td>\textit{Bem-te-vi}</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BM-S-11</td>
<td>10%</td>
<td>Petrobras</td>
<td></td>
</tr>
<tr>
<td>\textit{Iara}</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>\textit{Cernambi}</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lula</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BM-S-21</td>
<td>20%</td>
<td>Petrobras</td>
<td></td>
</tr>
<tr>
<td>\textit{Caramba}</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BM-S-24</td>
<td>20%</td>
<td>Petrobras</td>
<td></td>
</tr>
<tr>
<td>\textit{Júpiter}</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Espírito Santo</td>
<td>1</td>
<td>20%</td>
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<tr>
<td>Pernambuco</td>
<td>3</td>
<td>20%</td>
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</tr>
<tr>
<td>Campos</td>
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<td>Petrobras</td>
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<tr>
<td>Onshore</td>
<td>Potiguar</td>
<td>14</td>
<td>50%</td>
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<tr>
<td>Sergipe/Alagoas</td>
<td>2</td>
<td>50%</td>
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</tr>
<tr>
<td>Amazonas</td>
<td>3</td>
<td>40%</td>
<td>Petrobras</td>
</tr>
</tbody>
</table>

\textbf{Santos basin is comprised by four blocks: BM-S-8 with the Bem-te-vi field, BM-S-11 with the Iara, Cernambi and Lula (previously named Tupi) fields, BM-S-21 with the Caramba field and finally BM-S-24 with the Júpiter field.}

\textsuperscript{17} Thousand barrels of oil equivalent per day.
Bem-te-vi had its first discovery in 2007 and its oil is characterized by an API of 28-30° which classifies it as medium crude. Production is expected to begin in 2013 with the declaration of commerciality delivery in December 2012 and EWT in 2012. Reserves are assumed to be 1120Mbbl, slightly below other fields.

Iara has been in evaluation since the end of 2008 with its EWT scheduled for 2013 and its declaration of commerciality by December 2013. Recoverable oil and natural gas is between 3 to 4bln (4000 Mmbbl) with production in 2014.

Lula and Cernambi are the most developed fields in the basin with production already happening in Lula. So far 14 wells have been drilled (100% success), with 6.44bln attributed to Lula and another 1.82 bln attributed to Cernambi. Declaration of commerciality was submitted in December 2010. A detailed plan of operations has already been developed with installed capacity of 1270Kboepd by 2017. This will comprise an investment of 9 FPSO units and 160 wells.

Caramba was established in 2001 with the first light oil discovery in 2007. Seismic evaluation was performed during 2009 and 2010 and due to the positive results the second exploration well will be drilled in 2013. Declaration of commerciality is expected by April 2015 and production in 2016. Reserves are assumed to be 1600Mbbl and may vary with future information. Jupiter had its first oil discovery in 2007 and the first appraisal well was scheduled for 2011. Its EWT will only be carried in 2016 and its declaration of commerciality is expected to be delivered until February 2016. As a result, production is expected to take place on the second half of 2016, with 1400Mbb of potential reserves.

Operations in Brazil are subjected to specific characteristics. Operating costs are mostly comprised by labor and energy costs and despite Petrobras efficiency these are expected to increase over time. Since Petrobras is the operator in most of the fields where Galp Energia is present, the evolution of its lifting costs is extremely relevant. Finding and developing costs have been close to 20$/bbl\(^{19}\) and will increase over time due to higher iron/steel prices, increase in 2D and 3D seismic testing, among others. Since these operations are in deep water conditions, Petrobras historical costs are not representative of operations in the Santos Basin. This translates into higher capital expenditures (i.e.: wells can cost up to $200M for deep water exploration where common values are located below $80M), higher F&D costs and higher operational/lifting costs. Shallow water operational costs are often between 10$/bbl-15$/bbl but deep water production

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18 Extended Well Tests – Used to evaluate the productivity and characteristics of reservoirs.
19 Petrobras Business Plan.
can cost much more, reaching values close to 70$/bbl\textsuperscript{20}. Brazilian Energy Minister Edison Lobao declared in October 2008\textsuperscript{21} that operational costs, including royalties, would remain between 40$/bbl-50$/bbl which compares to an average 32$/bbl on easier to drill projects. This implies an increase of 10-15$/bbl to Petrobas historical lifting costs. Oil spill in the Gulf of Mexico, despite demonstrating the inherent risks of this activity, had no significant impact since deep water projects are still being pursued and technological improvements will reduce the probability of such occurrences.

Taxation is carried out in three different forms: Royalties of 10% of sales, SPT tax of 0% to 40% of operating profit and a corporate tax rate of 35% over EBT. The SPT tax is determined according to the annual production.

Capital expenditures were determined by considering the expenditures associated with the construction of wells (both injection and extraction wells), FPSOs, and maintenance. Each field was given an average life of 25 years and production was determined as a function of the number of wells, FPSOs and their average production. Due to the difficulties involved in deep water exploration, wells can cost up to $200M. Due to the different type of wells and conditions on each field, an average cost of $140M was used (while 1/3 of wells corresponds to injection wells). FPSOs cost on average $1,700M, obviously varying with the size and characteristics of each unit. Capex during 2012-2015 is estimated to be €2,500M for Galp Energia.

Galp Energia recently established a partnership with Sinopec, in which Sinopec obtained 30% of the company’s holdings in Brazil through a capital increase of $4.8B (€3.6B). This transaction has an implicit value of $12.5B (€9.4B) for Galp Energia’s assets. According to our valuation of the Brazilian assets (figure 25), the fair value of the assets corresponds to $12.2B (€9.1B), implying that this sale


had a positive contribution for the company. Moreover, this transaction did not grant Sinopec a controlling position and Galp Energia remains the major stakeholder. As a consequence, accounting consolidation is performed under the full consolidation method and the transaction will boost the company’s Equity (through minorities) by €3.6B and Assets (cash) by the same €3.6B. Also associated with this transaction is the credit line which Sinopec extended to Petrogal Brazil.

Our view on the transaction is not shared by many analysts that had valued these assets around 15$B (€11.1B). Following the announcement, Galp Energia’s share price suffered a sharp decline, going from €15 to €11.5 per share. We stand by our valuation and we believe that Sinopec’s entry greatly reduced the financial risks of the E&P segment. Additionally, we strongly believe that the high decrease in prices is not simply a result of the transaction. Markets are fairly pessimistic, especially in regards to companies operating in countries directly involved with the sovereign debt crisis. The eventual “bad news” that analysts described possibly led investors to short positions. One common point, however, is that all analysts believe the partnership greatly reduced financing risks.

Angola

Galp Energia is present in Angola since 1982, with current holdings in four different locations: Block 14, Block 14K, Block 32 and Block 33. Block 14K is operated by Chevron, containing a total of 300Mbbbl with production starting in 2018. Due to the small amount of reserves and because of the CPT\textsuperscript{22} already installed in block 14, synergies can be used and a low amount of investments is required. Block 14, where Galp detains a share of 9%, is comprised by Tombua-Lândana, Malange and Lucapa. Tombua-Lândana has been producing since 2006, depleting part of its reserves. Current tests indicate a total of 350Mbbbl left to obtain which are believed to be fully extracted in the next 20 years. Actual production is of 60kbopd and no further capacity improvements are required given the level of reserves. As a result, most capital expenditure comes from maintenance. Malange & Lucapa are believed to contain a total of 1200Mbbbl in reserves and production is expected to take place in 2016. Due to the large amount of reserves, a significant amount of investment will be required. Block 32 is operated by Total and there is much uncertainty regarding both production and potential reserves. Consensus dictates that reserves may be close to 1500Mbbbl and production might occur in 2017. We considered these numbers when valuing

\begin{tabular}{|c|c|c|}
\hline
Field & Reserves & Production \\
\hline
14K & 300 & 2018 \\
Block 14 & 350 & 2006 \\
Tombua-Lândana & 1200 & 2016 \\
Malange & Lucapa & 1500 & 2017 \\
\hline
\end{tabular}

\textsuperscript{22} Compliant Piled Tower.
it. Finally, Block 33 is not valued since the level of uncertainty is bigger than in Block 32.

Operational costs in Angola have constantly increased over time, reaching 17$/bbl in the 3rd quarter of 2011. Taxation in Angola is performed under a production share agreement (PSA) where total production (denominated working interest production) is split into two different components: oil cost and oil production. Oil cost refers to the share of production that is used to cover operational costs and capital expenditures. The exceeding amount is denominated oil production, and this portion is shared between the operator and the government at a PSA rate that can go from 0% to 70%, similarly to the SPT tax in Brazil. This implies that, from the overall production, companies retain the share of oil cost and a portion of the oil production. This is denominated net entitlement which has historically corresponded to 65% of working interest production (35% remains with the government). Due to the assumed increase in operational costs, oil cost will increase and the company will retain a higher share to support the higher costs. We estimate an increase from 65% to 70%. The second stage of taxation involves a corporate petroleum income tax of 50% that is applied to the EBT.

Mozambique & others

During the drilling of a well in Mamba south 1 Eni discovered a massive quantity of Natural Gas. It is believed that a total of .7.5 Tcf is contained in the field. Galp Energia owns a 10% stake over this field and plans to commercialize the discovery are being taken. The valuation is performed based in the oil parity due to the lack of a global market for NG. We felt this was the appropriate pricing method since this field will export to Asian markets, where oil parity is commonly used. Eni’s historical operational costs appear to be lower than the ones included in our valuation of Brazil/Angola. However, ENI’s operations do not comprise the same level of deep water and pre-salt exploration that Petrobras does. Since Mamba south 1 is also considered deep water, we added an additional $15/bbl, similar to the procedure in Petrobras. Taxation follows a production share agreement where NG royalties are 6%. We found no information regarding SPT taxes but even if these did not exist, they would most

\(^{23}\) Gas is priced on an energy equivalent basis (i.e.: 17% of crude prices).

likely be created. It is unlikely that the government will allow foreign companies to profit from its territory and not extract a higher portion of taxation. The corporate tax in Mozambique is of 32%. Capital expenditures are estimated to be around €280M for the period of 2012-2015, with production starting in 2014. Galp Energia’s holdings in other countries are not valued since no reserves have been found and they are included in the company’s strategic goals.

Valuation

Each field was analysed separately through an Adjusted Present Value model since the Debt-to-equity ratio under each project is not constant. Moreover, debt usage in such projects is highly common and an analysis based on comparables easily yielded a fairly accurate level of debt usage (Interest bearing debt often corresponds to 30% of Equity and 16% of Total Assets). All publicly available information was used when estimating reserves, operational costs (lifting costs), F&D costs (relevant for depreciation), equipment and taxation. We believe brent prices may drop slightly in the near future but long-term expectations consists in 132.90$/bbl25 by 2035. Combined with the expectations of euro depreciation, taxation and a lower value for Galp Energia’s crude given its heavier composition (5% discount over Brent), we obtained:

![Figure 23: E&P valuation (Total EV)](image)

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25 OPEC’s World Oil Outlook 2011.
Since oil fields are assets common transacted, it is imperative that we compare the results of our valuation with the commonly negotiated values. Appendix 2 contains a list of the transactions that took place during 2011, along with the average implied reserve value ($/boe) on these transactions. To compare our approach, we also present in the same appendix the implied reserve value ($/boe) for each of our fields. It is important to denote that values vary depending on the reserves that we consider: Proven reserves (1P), Probable reserves (2P) and Possible reserves (3P). This notation depends on the probability of existence of such reserves. The only field in which we compared through 1P was the Lula & Cernambi field due to the high degree of certainty. Our results indicate that our valuations are situated between 7.51$/boe and 3.81$/boe, averaging 6.26$/boe. The 2P average implied reserve value displayed close to 5$/boe in the first and third quarter of 2011, along with an astonishing 12$/boe in the second quarter of 2011. This leads to an average of 7.37$/boe which could indeed indicate that our analysis underestimated the value of the fields. However, one could also state that the transactions verified in the second quarter of 2012 were fairly abnormal and we should thus compare it only to the most recent information of 4.9$/boe. The conclusion is not evident but we believe our analysis matches the current market uncertainty, fitting both optimistic and pessimistic views.

**Refining & Marketing**

**Market Overview**

The downstream market is extremely dependent on the future policies that might be developed. Policies targeted at a reduction of emissions can highly compromise the market viability of most fossil fuels. Subsidies on cleaner energies, costs on CO₂ emissions and other polluting substances may highly influence the future pattern of product mix that is most desired by agents. Technology improvements also stand as one of the major key drivers of future product demand. Improvement on efficiency lowers oil product consumption and the development of alternative vehicles, such as hybrid or electric cars may lessen long-term demand for gasoline and diesel. On a general consensus, environmental concerns have slowed down with the current recession, but they are bound to rise given its importance. Our view focuses on a gradual decrease of product oil demand in developed countries, and a major increase in developing

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26 1P (90% confidence); 2P (50% confidence); 3P (10% confidence).
economies. Since much of the refining capacity is installed in developing economies, this promotes trading. Due to transportation costs, companies often supply their marketing activities from local refineries\(^2\). This implies that refineries in Developing economies are bound to surge. OPEC estimates indicate that around 6.8Mb/d of crude distillation capacity will be added in the period from 2011-2015.

Europe currently shows a shift towards middle distillates, with an increase from 6.2Mb/d to 6.5Mb/d of diesel demand. This pattern emerged due to the lower taxation of middle distillates, resulting in lower prices for gasoil. For instance, average EU gasoline price (after-taxes) is situated around €1.423/l\(^26\) while gasoil displays €1.398/l. Before taxes, average EU gasoline prices correspond to €0.646/l and gasoil correspond to €0.751/l. The spread between after-tax prices has decreased over time but gasoil has higher energy content, allowing users to travel greater distances. With the current release of the European Commission (EC) proposal denominated “Proposal for Council Directive amending Directive 2003/96/EC restructuring the Community framework for taxation of energy products and electricity” the EC seeks to resolve policy inconsistencies which induced a greater taxation burden in products with lower energy content. Since gasoline has lower energy content the applicable tax burden was higher. The introduction of this proposal results in a gradual increase of the minimum tax rate for on-road motor fuels (with the exception of gasoline) as represented in figure 26. Since this policy only interferes with minimum rates, it does not necessarily imply equal taxation since EU state members may establish different final rates but it does alleviate much of the existing dispersion. This leads us to believe that gasoil prices will increase, approximating those of gasoline.

The refining activity in Europe is ever more complicated due to possible mandates on biofuels, transport efficiency and carbon emissions. Furthermore, the European refining industry continues to suffer from overcapacity. Capacity additions are limited to certain regions with most investments taking place in conversion projects, as a direct result of the shift towards middle distillates. Many refineries in Western Europe are either for sale, being converted into storage facilities or face closure\(^2\). This overcapacity is expected to lead utilization rates from 76% to 60% by 2035. For instance, Petroplus is closing three refineries,

\(^2\) Shipping costs may go up to 2.46$/bbl, with an average of 1.85$/bbl in accordance with Oil&Gas Journal 2009.

\(^26\) Europe’s Energy Portal. 08-12-2011.

\(^2\) Majority of companies includes Shell, Total, Chevron and ConocoPhillips.
Total closed one refinery in France, Shell is selling its refinery in Sweden, Eni is selling its refinery in Italy and Chevron in the UK\(^30\).

**Refining**

Galp Energia’s refining activity takes place in two refineries: Sines Refinery with a 220kbbld capacity and Matosinhos Refinery with a 90kbbld capacity. Gasoline and diesel prices practiced by Galp Energia are higher than the average European value. A deeper analysis indicates that aside from higher taxation in Portugal, Galp Energia also acquires a higher margin at refinery exit prices (appendix 3). A refinery’s advantage increases the closer it is to its distribution network. In the case of Portugal, Galp Energia detains most of the logistics, providing a comparative advantage over alternative producers. Moreover, competitors operating in Portugal such as Repsol, BP and Cepsa rely on Galp Energia’s refineries for supply, reducing their overall transportation costs.

Refining margins are highly dependent on the crack spread of each comprising product in the production mix. Galp Energia currently invested €1.400million in a conversion project which aims to transform heavier crudes into middle distillates. The project boosts Galp Energia’s production by 20kbb/s and increases gasoil production through the use of less costly material, such as fuel oil. Conversion has been concluded in Matosinhos refinery but major impacts are expected with the conclusion in Sines. Diesel weight in the product mix will increase from 35% to 50% by 2020, taking advantage of higher crack spreads associated with these products. The impact in Galp’s refining margin is displayed in the following graph:

> **Expectations imply an approximation of each crack spread towards its pre-recession levels with the exception of diesel. Due to the increase in diesel taxation, as discussed earlier, diesel crack spread is believed to suffer a slight**

\(^{30}\) Petroleum Oil Economist, March 2010, “European oil refinery closures get serious.”
decrease from 2015 onwards. The expected approximation between diesel/gasoil and gasoline prices does not invalidate the value of the conversion project for several reasons: diesel has a higher energy content that allows for greater distance traveling; matching minimum taxation levels does not necessarily correspond to matching final taxation; non-existing flexibility in fuel switching (vehicles do not operate under different fuels); the taxation proposal is only expected to be completed by 2018. Current diesel and gasoline spreads are 17.59$/bbl and 9.87$/bbl, respectively.

Other operational costs such as energy and labor wages are expected to increase at the inflation rate of 2% (with the exception of the following years due to current policies in Portugal and expected negative GDP growth for the following two years). Utilization rates have historically diminished and such tendency is believed to continue due to overcapacity in Europe. Since 83% of the sale of refined products takes place in Portugal, we estimated the Portuguese demand based on our beliefs of Portuguese real GDP and Brent prices\textsuperscript{31}. By estimating demand one can understand the evolution of the utilization rate, thus confirming a final utilization rate of 72%. Moreover, if one assumes that movements in the Portuguese economy are fairly systemic, estimation of exportations can also be achieved as the main exporting destinies are the USA, Mexico and several European countries. Crude processed in Galp’s refineries is slightly heavier than Brent. Historically, this discount was close to 4.3$/bbl in 2007, reaching a value of 1.04$/bbl in 2009. Expectations involve a constant decrease of this discount towards 0.5$/bbl due to a convergence in the spread between heavy and light crude.

Capital expenditures in the implicit period include maintenance and an additional €70M to finalize conversion in 2012. No further investments are expected due to over capacity and a historical constant increase in the HIS CERA downstream Capital Costs Index\textsuperscript{32} (which changed from 100 in 2000 to 180 in 2010).

Marketing

The marketing or distribution segment of Galp Energia is comprised by the wholesale and retail sale of processed products. Located throughout the Iberian Peninsula and Africa, Galp Energia contains a total of 1539 service stations and 509 convenience stores, which allowed it to achieve total sales of 16.68Mtons

\[ \Delta \text{Gasoil Demand}_t = 1.22 \Delta \text{GDP}_t + 0.044 \Delta \text{Brent}_t + 0.502 \Delta \text{Gasoil Demand}_{t-1}, R^2=80.8\% \text{ and all variables are statistically significant at a } 5\% \text{ confidence interval. Values in intervals correspond to } P_i \text{ values.} \]

\[ \text{IHS Cambridge Energy Research Associates – Measures the change in downstream construction costs.} \]
during 2010. Wholesales represent the biggest share of direct sales, accounting for 35.7% of total sales in 2010. The large dependence on the wholesale market implies vulnerability in times of recession due to a decrease of disposable income. Historically, both turnover and operating profit have been very constant, a result of the rigidity of demand over oil prices. Revenues vary from €350 to €450 per ton of refined product sales while operating margin persists between €20 and €30 even during periods of recession. This demonstrates the company’s ability to transfer costs (raw material prices) onto clients, allowing it to maintain a constant margin over time. It is our belief that this reality will persist over the implicit period and major changes will be occurring in the quantity of total sales and not in the margin per sale.

With the entry of supermarkets that are capable of selling oil products at lower prices, oil producers have lost market share. An interesting view supported by many Iberian citizens lies in the quality of the product itself, providing producers with a differentiated product. Fuel sold by supermarkets is often perceived has having lower quality due to the lower amount of additives included in the fuel. It is this reduced amount of additives that allows supermarkets to charge lower prices. Furthermore, the strategy behind supermarkets lies not in creating profits from fuel sales but to attract customers and benefit from cross-selling. Several testimonies state that while less expensive, fuel sold by supermarkets possesses lower energy intensity, resulting in lower traveling distances. As such, the higher prices practiced by Galp Energia, BP, Repsol and Cepsa are compensated by the extra mileage that such fuels provide. The validity of such arguments is unknown and during 2010 supermarkets possessed a market share of 18%. Given the expectation of reduction in disposable income due to policies introduced in Portugal, we expect this share to increase up to 25% during our analysis implicit period. As a result, total sales are expected to fall over the next two years reaching 16.41Mtons in 2013 and recovering to 2010 levels by 2016.

Expansion of the marketing activity to Africa yielded great results, contrary to the Iberian Peninsula which is characterized by a stagnant market. Over the past years sales in Africa grew on average 5% per year but expectations of future growth are more modest. In 2010 sales in Africa reached 0.58Mtons (3.5% of total production) and plays an important role due to the future expansion possibilities given the increase in the number of vehicles in such countries.
Valuation

Both the refining and the marketing segments were evaluated based on a DCF model. Both areas were attributed a nominal terminal growth rate of 2% which implies zero growth over time. Our view is that the stagnation of markets and the stabilization of activities imply lack of real growth for these activities. Capital expenditures are associated with mostly maintenance, the finishing of the conversion project in 2012 and construction of service stations and convention stores over the next 10 years. Other assumptions relate to the tendency of crack spreads to move towards pre-crisis levels, the increase in diesel production and the reduction in utilization rates. Through our analysis we reach a value of €4.11 per share for the R&M segment.

Figure 32: R&M valuation (Total EV)

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<th>Base Scenario (P=95%)</th>
<th>Worst Scenario (P=5%)</th>
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<tr>
<td>Implicit Period</td>
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<td>4.19 €</td>
<td>2,114.80 €</td>
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</table>

Source: Analyst estimates

Gas & Power

Market Overview

Demand for natural gas is expected to increase from 53.6Mboe/d in 2010 to 90Mboe/d in 2035 which makes it the fossil fuel with the highest demand growth over the next 25 years. According to the IEA, uncertainty regarding the future of natural gas is very low and we could expect a golden age for this commodity. Natural gas is in many ways a replacement for oil and coal, two extremely polluting sources of energy. Mostly used in electricity generation, natural gas induces a low level of pollution making it perfectly acceptable under current environmental policies. China is in fact developing policies to increase the usage of NG in energy production. Unlike oil, both developed and developing economies present an increase in demand, with a 0.5% and a 2.0% growth rate, respectively. Aside from power generation, NG is also commonly used for building and industrial purposes, two segments that are in great expansion in the

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33 International Energy Agency.
developing side of the world. Alternative sources of energy such as renewable (wind, geothermal and solar) do in fact grow at a faster rate but given its low base they are far from being sufficient. With the current events in Japan nuclear energy lost its appeal not only due to the massive investment that is required, but specially due to safety concerns.

One of the major characteristics of this type of energy relates to its regional nature. Difficulties associated with transportation induce lower competition. Thus, natural gas is mostly priced at regional levels with lack of a global market. The only transparent markets correspond to the US and the UK. The US market is priced at the “Henry Hub gas pricing” and it corresponds to an actual physical interconnection point in the natural gas pipeline in Louisiana (priced at $/mmbtu). The UK market is priced at GBp/term and every other market (i.e.: Europe, Asia) is mostly comprised by long term contracts where the price of NG is indexed at alternative sources of energy. To price NG under these markets, agents often rely on the oil parity. With the increase in importance, transparency over NG trading is bound to increase but will we ever see NG baskets being traded? The limitations on transportation might be solved through the development of further pipelines (i.e.: Eurasia NG trading). Alternatives for transportation lie in LNG and CNG but these are fairly costly due to the difficulty in maintaining gas in a liquefied state.

**Liberalised NG**

Operations under the gas segment include both liberalized and regulated activities. The liberalized activities include the supply and commercialization of NG while regulated activities include the distribution, storage and a small portion of commercialization.

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34 Liquefied Natural Gas.
35 Compressed Natural Gas.
Sales in the liberalized and regulated activity evolve in opposite directions with a tendency for clients to move from the regulated to the liberalized. The current deregulation of energy markets being taken in Portugal implies that both energy and natural gas will be freely commercialized by 2013. A small amount of clients may still persist in the regulated activity but actions will be taken to incentivize the movement towards a free market. Liberalized sales accounted for 57% of total sales in 2008 and by 2010 this number evolved to 75%.

Supply of natural gas is acquired through long term contracts with Algeria and Nigeria. Transportation is made through shipments of LNG where prices are indexed as a function of alternative sources of energy, such as crude benchmarks, inflation and exchange rates. Despite a maturity of 20 years, these contracts can be renegotiated. In the future Galp hopes to supply some of its activity with operations both in Angola and Brazil. During 2010 a total of 6bm\(^3\) was supplied, corresponding to the contracted amounts. However, supplied quantity may vary since a portion of the contracted amount may, or not, be acquired depending on Galp Energia’s supply needs.

Commercialization of natural gas involves sales to Portugal, Spain and trading activities. In 2010 Portuguese sales accounted for 84% of the liberalized activity, followed by 13% in trading and 3% for Spain. Due to the austerity measures in Portugal, and given the massive weight of liberalized sales, total sales are expected to slow down over the next two years. Since sales mostly target industries and electricity generation, the increase in VAT verified in October 2011 is not expected to produce big distortions in sales. Companies will be capable of transferring those costs onto consumers who face a rigid demand over energy and natural gas over the short and medium term\(^36\). Moreover, companies can recover VAT from the government. Although debatable, the impact from the increase in VAT is expected to be almost negligible in the long run. Prices through which gas is sold are also indexed based on crude benchmarks implying that Galp Energia receives a fixed profit margin over each transaction. Slight variations occur under periods of major changes on crude Brent prices, but given our smooth expectations on future prices\(^37\), such variations are not to be expected. Historical margins vary between €0.03 and €0.028 per m\(^3\) of NG sold, displaying great resilience to the

<table>
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<th>Contracts</th>
<th>Country</th>
<th>Amount (Mm(^3/\text{year}))</th>
<th>Years</th>
<th>Start</th>
</tr>
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<td>420</td>
<td>20</td>
<td>2000</td>
</tr>
<tr>
<td>NLNG II (LNG)</td>
<td>Nigeria</td>
<td>1000</td>
<td>20</td>
<td>2003</td>
</tr>
<tr>
<td>NLNG+ (LNG)</td>
<td>Nigeria</td>
<td>2000</td>
<td>20</td>
<td>2006</td>
</tr>
<tr>
<td>Sonatrach</td>
<td>Algeria</td>
<td>2300</td>
<td>23</td>
<td>1997</td>
</tr>
</tbody>
</table>

Source: Galp Energia

\(^{36}\) Bernstein, Mark A. Griffin, James. “Regional Differences in the Price-Elasticity of Demand for Energy.”

\(^{37}\) With the introduction of measures to decrease speculation over oil prices, volatility is expected to decrease and fundamental theory is expected to become more effective over the following years. OPEC World Oil Outlook 2011.
current crisis. Capital expenditures over the following years only include maintenance since Galp’s strategy focus has shifted towards E&P.

Regulated NG

As stated in the previous section, the regulated activity involves distribution, storage and commercialization. The distribution and storage portion of this segment is remunerated in the basis of allowed revenues. Allowed revenues are granted in accordance to a regulatory asset base and a rate of return.

\[
\text{Allowed Revenues} \times \text{Rate of Return} + \text{Depreciation} = \text{Acceptable Operational Costs} + \text{Tariff Deviation}
\]

Cost of Capital

The rate of return applicable to storage is set at 8% until 2013 in which a reevaluation of this rate will take place. Distribution is attributed a higher rate of 9% and it will last approximately the same period as storage. When inquired, ERSE\(^{39}\) indicated no possible predictions on future remuneration rates but stated that natural gas regulation usually follows that of electricity. Electricity regulation, which was altered this year, increased the remuneration rate to 9% with RAB revaluations every year. Historically, natural gas was remunerated at a slightly higher rate than energy but we also believe 9% to be a satisfying cap at remuneration given the low WACC\(^{39}\) of such regulated activities.

The regulatory asset base for distribution was valued at €1184M for 2010. Distribution of natural gas includes a total of 10 distributors where 4 are considered to be autonomous (ADU). Out of those 10 distributors the company is present in 5 concessions and 4 autonomous distributors (Duriensegás, Paxgás, Dianagás and Medigás).

Since this segment’s WACC is estimated to be 7.4% and the remuneration rate is expected to stabilize at 9%, there is value in further expanding the RAB. Since RAB has historically grown, with reevaluations based on the inflation rate, we assumed a constant increase of RAB in accordance with our long term inflation target of 2%. This does not imply that Galp Energia will be acquiring new infrastructures. In fact, we believe that capital expenditures will only comprise

\(^{38}\) Entidade Reguladora dos Serviços Energéticos.

\(^{39}\) The efficiency of a regulator lies in evaluating the risk of the regulated activity (measured by the cost of capital) and attributing a rate close to the WACC. This rate should be slightly higher than the WACC to promote investment.
maintenance. The increase in RAB originates from the concession contract established between the Portuguese state and Galp Energia. Storage assets were valued at €18M in 2010 and its value is not expended to alter in the following years. During 2011 Galp Energia tried to increase its storage RAB by acquiring NG storage caverns but concession was granted to REN. This strengthened our belief that the storage RAB will only vary with reevaluations. However, it is relevant to point out that the right of expansion was attributed to Galp Energia. We simply do not believe that investment will take place given the major business projections in the E&P segment.

The final portion of the regulated activity relates to commercialization and Galp is remunerated based on the number of clients. A client’s remuneration of €4/client/year was attributed during the initial five years of the regulatory periods. Since each regulatory period is comprised by three years, this remuneration persists over a total of 15 years. Given the constant diminish of clients in the regulated commercial activity and the predisposed deregulation of the market, the size of this activity is negligible. To further sustain this view, Galp Energia stopped releasing information on the regulated portion of commercialization.

Valuation

Valuation of the gas activity was also based on a DCF model through the WACC method. Terminal growth rate of 2% was used as we do not believe that real growth can be attained due to decelerating demand on the Iberian market.

Source: Galp Energia

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40 “The Portuguese state guarantees the concession holder, in order for a financially balanced concession to be achieved, the remuneration of the activities covered by the concession as well as the revaluation of the concession assets at the inflation rate at the start of each regulatory period.” Quote from Galp Energia.
Our valuation implies that the EV of each asset is above the RAB, resulting from the fact that our cost of capital is below the remuneration rate. This implies that our computation of the cost of capital yields a lower result than the one computed by ERSE (regulatory entity), otherwise the remuneration rate would be lower. By looking at the new regulatory regime for electricity, we observe that ERSE’s computations often rely on Credit Default Swaps (CDSs) or the spread between treasury yields to determine the country risk. While we agree that this might yield appropriate values under less stressful times, we do not support utilizing this method at current times.

**Power**

The power segment represents the smallest segment in Galp Energia’s operations, characterized by the lowest revenues, net income and overall enterprise value. Galp Energia’s shift towards upstream operations reduced its previous ambition in this segment, which included the creation of a CCGT plant with 800MW of capacity along with expansions towards wind power. Currently comprised with a capacity of 160MW coming from holdings in Carriço, Powercer and Energin which total 80MW and Sines cogeneration with an extra 80MW. Completion of the Matosinhos cogeneration facility is expected to complete on the beginning of 2012, boosting production capacity by an extra 80MW. The company is still pursuing investments in renewable energies, with a holding of 49% in a major wind project with a 200MW capacity to be completed by 2013 (Ventinveste, S.A). Furthermore, Galp Energia is also present in a 12MW Vale Grande wind farm that started construction last year and its completion is expected to finish in 2011. Galp Energia’s assets are under special regime and have priority of access to the grid, selling at a regulated tariff. As a consequence, sales to the grid have increased over the past years. For comparison purposes we analysed the energy generating capacity of EDP which corresponded to 21990MW in 2010 (more than 100x the capacity of Galp Energia). This signifies the almost negligible contribution of Galp Energia towards the Portuguese energy production.

Historically the energy segment has yielded a margin between €0.069 and €0.079 per MW of energy produced. We expect this margin to increase, following its current trend. By 2015 we estimate the margin to be €0.078, stabilizing at a value of €0.083 by 2020. Capital expenditures mostly comprise maintenance since many investments did not come to take place. Troika has tasked the Portuguese
government with analyzing the efficiency of renewable energy subsidization. No results have been announced but possible reductions in subsidies will affect Galp Energia's commitment in the renewables portion.

Valuation

Our valuation over the power segment is based on a DCF model with a terminal growth rate of 3% since we believe commitment to renewable energies implies future real growth. We value the segment in €0.50 per share.

Figure 38: Power valuation (Total EV)

<table>
<thead>
<tr>
<th></th>
<th>Base Scenario (P=95%)</th>
<th>Worst Scenario (P=5%)</th>
<th>Expected Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fair Value € per Share</td>
<td>Fair Value € per Share</td>
<td>Fair Value € per Share</td>
</tr>
<tr>
<td>Carriço</td>
<td>27,49 €</td>
<td>22,40 €</td>
<td>27,23 €</td>
</tr>
<tr>
<td>Powercer</td>
<td>6,60 €</td>
<td>5,38 €</td>
<td>6,54 €</td>
</tr>
<tr>
<td>Energin</td>
<td>38,48 €</td>
<td>31,36 €</td>
<td>38,13 €</td>
</tr>
<tr>
<td>Sines</td>
<td>73,30 €</td>
<td>59,74 €</td>
<td>72,62 €</td>
</tr>
<tr>
<td>Matosinhos</td>
<td>73,30 €</td>
<td>59,74 €</td>
<td>72,62 €</td>
</tr>
<tr>
<td>Wind Power</td>
<td>187,58 €</td>
<td>154,75 €</td>
<td>185,94 €</td>
</tr>
<tr>
<td>Vale Grande</td>
<td>11,00 €</td>
<td>8,96 €</td>
<td>10,89 €</td>
</tr>
<tr>
<td>Power</td>
<td>417,74 €</td>
<td>342,32 €</td>
<td>413,97 €</td>
</tr>
</tbody>
</table>

Source: Analyst estimates

Financials

In the following years Galp Energia’s operating profit is expected to grow at an average annual rate of 30%, fuelled by the growth opportunities present in the E&P segment.

This increase in operational result surges in the presence of major capital expenditures which are being taken over all segments. Most capital expenditures were incurred over the conversion project, characterizing R&M as the segment with the largest investment over 2010/2011. Afterwards, most investment will be taken in the E&P segment given the projected business plan for Brazil and the constant new oil and natural gas findings.
During the period between 2012 and 2015 a total investment of €3.9B will be required. In order to finance such projections, Galp Energia established a partnership with Sinopec, resulting in a capital increase of $4.8B (€3.6B). This amount will cover 30% of capital expenditures in the Brazilian operations, significantly reducing financing needs. An additional €0.8B increase in debt already took place in 2011. The transaction led to an increase in Equity of €3.6B due to full consolidation, sharply decreasing the Debt-to-Equity ratio to 0.59 in 2011. Despite the decrease in interest bearing debt, the expectations of an increase in the effective interest rate lead interest payments to increase. However, the EBITDA/Net interest expenses ratio will strongly improve from 2013 onwards, representing the company’s ability to comply with its obligations.

Galp Energia was also considering selling part of its regulatory asset base in the distribution of natural gas. Given the success in negotiating with Sinopec, this sale was postponed and we do not foresee sufficient capital requirements in the near future to justify such sale. Under the possibility of such a sale occurring we assume no premium will be paid, maintaining our valuation proposition of €15.17 per share.

Alternative Scenario

Scenario Overview

One of the major uncertainties underlying the current economic outlook lies in the sovereign debt crisis and the sustainability of the euro. Confidence in the euro is threatened by the high level of deficit and public sovereign debt that certain EU members display (appendix 4). Some consider that the survival of the euro can be achieved by inviting these members to leave the monetary union while others state that this is impossible, going against the euro’s purpose and the Maastricht
A continuous effort in helping stabilize the conditions of these less attractive countries has occurred but there is no guarantee that this will persist. Despite the legal, financial and political intricacies, we believe the scenario that involves a unilateral exit to be more likely than a full dissolution of the euro since the overall level of stress is lower. Thus, we focus on the scenario in which Portugal, either through its own decision, or through enforcement, leaves the European Union. By leaving, Portugal returns to the escudos currency which rapidly depreciates. Quantifying this devaluation is extremely difficult given the unprecedented circumstances. A recent study carried out by UBS\textsuperscript{41} over the Greek case implies depreciation close to 60%. An alternative can be achieved by considering the Argentina’s decision to leave the dollar and reintroduce the peso, resulting in a depreciation of 75%. While the underlying characteristics of the Argentine and Portuguese case are different, we denote that economic models are fairly useless at predicting extreme scenarios and extreme shocks tend to be underestimated. As a result, we consider a depreciation of 70%, characterized by run on the banks as agents wish to withdraw their euro deposits.

To summarize the evolution of our scenario, we assume Portugal maintains its austerity measures, presenting the base scenario negative GDP for the following years (around -3%). By 2014, Portugal leaves the euro as it fails to meet the necessary reduction in deficit. This would cause the country to face an immediate currency depreciation of 70%, induced by capital outflows. Agents would reduce their overall spending and save much of its money (especially euro holdings that they managed to maintain), which reduces economic activity. Moreover, the financing capability of companies would be very limited. The resulting scenario would include an initial real GDP growth of -3% for 2014, followed by a major boost towards -9.7% in 2015 as several companies face bankruptcy and overall consumption falls (similar to Argentina). No increase in taxation would occur since any further pursuit of austerity measures would be impossible. At this point the major question occurs: is the rest of Europe contaminated causing a double dip recession or is it merely an individual problem? At this point we chose to follow the scenario resulting in a second global recession around 2016. Portugal is believed to recover slightly faster than the rest of the world since it already stabilized from its situation and managed to benefit from its austerity measures and monetary policy. Positive growth of 3% would be expected around 2019.

Effect on Galp Energia

To comprehend the effect of these events, we must carefully analyse what will be the resulting operational impact on each of the segments that comprise Galp Energia. Our valuation is performed in euros and the depreciation of the Portuguese currency will only have an indirect impact through disposable income and demand changes. With the exit of Portugal and similar countries, the Euro could appreciate since the weaker members have left the union or it could depreciation as people perceive it as a failure. There is no consensus and we assume a fixed (USD/€) exchange rate over the implied period. Brent prices will decrease from 2016 to 2020 as a result of demand contraction coming from the expected recession.

Based in our belief that this second recession will be more devastating due to the difficulty that many countries will have in pursuing expansionary policies, cracking spreads are believed to worsen more than in 2008/2009. However, the fall in Brent prices positively affects refining margins. The estimated final effect is a small reduction in refining margins. Moreover, recession will decrease overall oil demand, in both Europe and North America, driving utilization rates down. To complement on this issue we face social unrest, increasing strikes. Utilization rate is estimated to decrease to 50% by 2020 based on our demand forecast. The marketing activity will also devaluate since the depreciation of the Portuguese currency greatly decreases the population’s purchasing power and the recession reduces exportations. Based on our estimate of demand, total sales will decrease from 16.68mtons in 2010 to 12.59mtons in 2020, with the lowest point in sales happening in 2018. During the current crisis Galp Energia maintained constant margins per sale and we believe this shall remain through with the exception of the period between 2015 and 2017, where the impact of depreciation will be capable enough to reduce this margin. This happens because the company will lose part of its ability to transfer crude prices onto customers since they do not possess enough disposable income to pursue such a major price increase in transportation.

The regulated portion of the NG segment is much less volatile to economic shocks as its revenues are secured through regulation. Under this extreme scenario, if the collections from customers are not sufficient to cover its allowed revenues, the regulatory entity may not be able to ensure the payment of the differential. Eventual devaluation comes from the possible decrease in the remuneration rate, as many people believe companies are significantly
benefitting from the current regime. We also believe the infrastructure should not be affected by the currency change, as the real value of the concession is maintained. However, the possible reduction in European inflation coming from the recession (contrary to Portugal), decreases our expectations on RAB revaluations. The liberalized commercialization is going to sustain devaluation. In spite of the rigidity of natural gas demand, such a massive depreciation in the value of the Portuguese currency will reduce NG demand as citizens cut back on some of their comforts and pay special attention to their wasteful actions. Additionally, with the harsh conditions several companies (who constitute this segment's biggest portion of clients) face bankruptcy or are forced to reduce their own production. The margin per sale depends largely on the spread between the values defined in the Long Term contracts and under our assumption that Brent Prices decrease from 2016 to 2022, the margin will reduce slightly. On an overall perspective, the NG segment proves to be fairly resistant to economic downturns.

The Power segment is very small and changes in energy demand are not believed to impact Galp Energia since other competitors such as EDP possess a much larger production capacity. Since the company already committed to the construction of Vale Grande along with the increase of its stake in Ventinveste, no changes on the capital expenditures are expected. However, contrary to the base scenario we do not expect an improvement in the margin €/MW, remaining at 0.07€/MW.

The E&P segment constitutes the greatest source of growth for Galp Energia. Since operations take place outside of Europe and Brent is priced at global markets, the Portuguese currency depreciation does not impact our valuation. The major impact in value comes from the expected decrease in Brent prices and difficulty in financing. Our view on the matter is that Galp Energia may have to sell part of its holdings in Brazil. These sales will most likely be badly negotiated given the company's pressing financing needs. In our analysis we do not consider any loss in the sale of assets. However, our assumed decrease in Brent prices reduces the attractiveness of the upstream segment and operations in the Caramba and Júpiter fields are postponed by 4 years. Since this second recession is believed to have a bigger impact, the overall oil demand will decrease. Due to difficulties in quantifying this impact, we assumed a Price changing rate of -1.4% from 2016 to 2022. This decreases our expectation of Brent prices from 134.5$/bbl to 122$/bbl in 2040. This segment strongly reduces Galp Energia’s dependency over Portuguese and European markets.
# Appendix

## Appendix 1: Comparables

<table>
<thead>
<tr>
<th>Comparable</th>
<th>Ticker</th>
<th>βl Raw</th>
<th>βl Adjusted</th>
<th>Mkt D/E</th>
<th>t Raw</th>
<th>t Adjusted</th>
<th>Market Yield</th>
<th>Rating</th>
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<tbody>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occidental Petroleum</td>
<td>OXY</td>
<td>1.14</td>
<td>1.10</td>
<td>10.11%</td>
<td>38.47%</td>
<td>1.08</td>
<td>1.03</td>
<td>3.024% A</td>
</tr>
<tr>
<td>Conoco</td>
<td>COP</td>
<td>1.14</td>
<td>1.09</td>
<td>27.54%</td>
<td>48.07%</td>
<td>0.99</td>
<td>0.95</td>
<td>2.949% A</td>
</tr>
<tr>
<td>Apache Corporation</td>
<td>APA</td>
<td>1.32</td>
<td>1.22</td>
<td>23.37%</td>
<td>44.96%</td>
<td>1.17</td>
<td>1.08</td>
<td>2.941% A-</td>
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<tr>
<td>Anadarko Petroleum</td>
<td>APC</td>
<td>1.49</td>
<td>1.33</td>
<td>41.24%</td>
<td>0.00%</td>
<td>1.05</td>
<td>0.94</td>
<td>4.215% BBB-</td>
</tr>
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<td>Delta Petroleum</td>
<td>DPTR</td>
<td>2.07</td>
<td>1.71</td>
<td>460.09%</td>
<td>0.00%</td>
<td>0.37</td>
<td>0.31</td>
<td>5.132% CC</td>
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<td>Devon Energy</td>
<td>DVN</td>
<td>1.16</td>
<td>1.11</td>
<td>26.40%</td>
<td>49.78%</td>
<td>1.03</td>
<td>0.98</td>
<td>3.146% BBB+</td>
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<td>Houston Energy</td>
<td>HUSA</td>
<td>1.85</td>
<td>1.56</td>
<td>0.00%</td>
<td>39.35%</td>
<td>1.85</td>
<td>1.56</td>
<td>0.000% NR</td>
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<td>Newfield Exploration</td>
<td>NFX</td>
<td>1.43</td>
<td>1.29</td>
<td>55.88%</td>
<td>36.71%</td>
<td>1.06</td>
<td>0.95</td>
<td>6.086% BB+</td>
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<td>1.64</td>
<td>1.42</td>
<td>43.94%</td>
<td>19.91%</td>
<td>1.21</td>
<td>1.05</td>
<td>9.724% B</td>
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<td>Chevron</td>
<td>CVX</td>
<td>0.80</td>
<td>0.87</td>
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<td>0.78</td>
<td>0.84</td>
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<td>0.85</td>
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<td>0.29</td>
<td>0.32</td>
<td>9.609% NR</td>
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<td>Repsol YPF</td>
<td>REP</td>
<td>0.93</td>
<td>0.96</td>
<td>0.88</td>
<td>23.78%</td>
<td>0.56</td>
<td>0.57</td>
<td>3.896% BBB</td>
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<td>Petro-Canada</td>
<td>PCZ</td>
<td>0.21</td>
<td></td>
<td>60.00%</td>
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<td>4.339% BBB+</td>
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<tr>
<td>Shell</td>
<td>RDSA</td>
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<td>1.02</td>
<td>0.20</td>
<td>42.72%</td>
<td>0.92</td>
<td>0.91</td>
<td>2.513% AA</td>
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<tr>
<td>Exxon Mobil</td>
<td>XOM</td>
<td>0.52</td>
<td>0.68</td>
<td>0.05</td>
<td>41.30%</td>
<td>0.51</td>
<td>0.66</td>
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<td>Chevron</td>
<td>CVX</td>
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<td>0.87</td>
<td>0.05</td>
<td>41.48%</td>
<td>0.78</td>
<td>0.84</td>
<td>3.754% AA</td>
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<tr>
<td>Total</td>
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<td>Adam Resources</td>
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<td>34.55%</td>
<td>1.10</td>
<td>1.06</td>
<td>0.000% NR</td>
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<tr>
<td>BP</td>
<td>BN</td>
<td>1.24</td>
<td>1.16</td>
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<td>34.22%</td>
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<td>0.92</td>
<td>3.436% A</td>
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<tr>
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<td>COP</td>
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<td>1.09</td>
<td>0.28</td>
<td>48.07%</td>
<td>0.99</td>
<td>0.95</td>
<td>2.949% A</td>
</tr>
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<td>Global Partners LP</td>
<td>GLP</td>
<td>0.63</td>
<td>0.76</td>
<td>2.04</td>
<td>0.00%</td>
<td>0.21</td>
<td>0.25</td>
<td>0.000% NR</td>
</tr>
<tr>
<td>Murphy Oil</td>
<td>MUR</td>
<td>1.17</td>
<td>1.11</td>
<td>0.15</td>
<td>41.17%</td>
<td>1.07</td>
<td>1.02</td>
<td>5.515% BBB</td>
</tr>
<tr>
<td>Valero Energy</td>
<td>VLO</td>
<td>1.38</td>
<td>1.25</td>
<td>0.77</td>
<td>37.38%</td>
<td>0.93</td>
<td>0.84</td>
<td>4.664% BBB</td>
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<tr>
<td>Alon USA</td>
<td>ALJ</td>
<td>1.14</td>
<td>1.10</td>
<td>3.07</td>
<td>25.17%</td>
<td>0.35</td>
<td>0.33</td>
<td>0.000% NR</td>
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<tr>
<td>Imperial Oil</td>
<td>IMO</td>
<td>0.87</td>
<td>0.92</td>
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<td>Sunoco</td>
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<td>0%</td>
<td>0.03</td>
<td>0.39</td>
<td>5.313% BB+</td>
</tr>
</tbody>
</table>

| Power                       |        |        |             |         |       |            |              |        |
| EDP                         | EDP    | 0.78   | 0.85        | 2.17    | 21.55%| 0.29       | 0.32         | 8.589% BBB |
| REN                         | RENE   | 0.44   | 0.63        | 2.16    | 32.33%| 0.18       | 0.26         | 12.441% BBB-|
| IBERDROLA                   | IBE    | 1.01   | 1.01        | 1.43    | 22.14%| 0.48       | 0.48         | 5.304% A- |
| ENAGAS                      | ENG    | 0.76   | 0.84        | 1.46    | 29.65%| 0.37       | 0.41         | 0.000% NR |
| E.ON                        | EQAN   | 1.04   | 1.03        | 0.92    | 3.12% | 0.55       | 0.54         | 0.000% NR |

Source: Bloomberg
Appendix 2: Transactions

Figure 40: Upstream transactions

<table>
<thead>
<tr>
<th>Region</th>
<th>Deal Count</th>
<th>Total Deal Value (US$MM)</th>
<th>Total Reserve Value (US$MM)</th>
<th>Wtd. Average Implied Proved Reserve Value US$/boe</th>
<th>Wtd. Average Implied 2P Reserve Value US$/boe</th>
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3Q 2011

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1Q 2011

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Overall 2011

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Source: IHS

Figure 41: Galp Energia’s upstream valuation

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Source: Analyst estimates
## Appendix 3: European fuel prices

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Source: Europe Energy Portal

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42 FOB indicates the purchase price of crude oil. Margin is the industry margin: refining, transport, insurance, stockpiling, distribution to petrol stations and sale to consumers. Excise duties and Value added Taxes, VAT, are taxes that are levied by governments.
## Appendix 4: OECD Sovereign Debt and Deficit

### Figure 43: Sovereign Debt and Deficit

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Source: OECD
# Financial Statements

## Balance Sheet

### €Millions

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### Equity and Liabilities

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### Liabilities

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<td>119</td>
<td>136</td>
<td>155</td>
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<td><strong>Total non-current liabilities</strong></td>
<td><strong>3,258</strong></td>
<td><strong>3,632</strong></td>
<td><strong>3,580</strong></td>
<td><strong>3,691</strong></td>
<td><strong>3,917</strong></td>
<td><strong>4,184</strong></td>
<td><strong>4,422</strong></td>
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<td>Bank loans and overdrafts</td>
<td>616</td>
<td>835</td>
<td>785</td>
<td>816</td>
<td>834</td>
<td>891</td>
<td>898</td>
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<td>Bonds</td>
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<td>280</td>
<td>280</td>
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<td>280</td>
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<tr>
<td>Trade payables</td>
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<td>1,561</td>
<td>1,422</td>
<td>1,517</td>
<td>1,696</td>
<td>1,856</td>
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<td>965</td>
<td>1,020</td>
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<td>34</td>
<td>34</td>
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<tr>
<td><strong>Total current liabilities</strong></td>
<td><strong>3,193</strong></td>
<td><strong>3,740</strong></td>
<td><strong>3,488</strong></td>
<td><strong>3,670</strong></td>
<td><strong>4,025</strong></td>
<td><strong>4,304</strong></td>
<td><strong>4,828</strong></td>
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<tr>
<td><strong>Total liabilities</strong></td>
<td><strong>6,451</strong></td>
<td><strong>7,372</strong></td>
<td><strong>7,068</strong></td>
<td><strong>7,360</strong></td>
<td><strong>7,942</strong></td>
<td><strong>8,488</strong></td>
<td><strong>9,270</strong></td>
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<tr>
<td><strong>Total equity and liabilities</strong></td>
<td><strong>9,162</strong></td>
<td><strong>13,894</strong></td>
<td><strong>13,694</strong></td>
<td><strong>14,169</strong></td>
<td><strong>15,229</strong></td>
<td><strong>16,352</strong></td>
<td><strong>18,063</strong></td>
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### Income Statement (€ Millions)

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<td>Turnover</td>
<td>14,226</td>
<td>16,425</td>
<td>15,169</td>
<td>16,017</td>
<td>17,689</td>
<td>18,742</td>
<td>21,538</td>
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<tr>
<td>Operating costs</td>
<td>-13,173</td>
<td>-15,364</td>
<td>-14,182</td>
<td>-14,726</td>
<td>-15,420</td>
<td>-15,943</td>
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<td>EBITDA</td>
<td>1,053</td>
<td>1,060</td>
<td>987</td>
<td>1,291</td>
<td>2,270</td>
<td>2,799</td>
<td>4,076</td>
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<td>Amortization, depreciation and impairment loss on tangible assets</td>
<td>-331</td>
<td>-405</td>
<td>-411</td>
<td>-486</td>
<td>-534</td>
<td>-638</td>
<td>-860</td>
</tr>
<tr>
<td>Provision and impairment loss on receivables</td>
<td>-83</td>
<td>-28</td>
<td>-29</td>
<td>-37</td>
<td>-71</td>
<td>-95</td>
<td></td>
</tr>
<tr>
<td>Operating profit (EBIT)</td>
<td>639</td>
<td>627</td>
<td>547</td>
<td>776</td>
<td>1,698</td>
<td>2,090</td>
<td>3,120</td>
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<tr>
<td>Share of results of investments in associates and jointly controlled entities</td>
<td>73,83</td>
<td>73,47</td>
<td>74,10</td>
<td>74</td>
<td>74</td>
<td>75</td>
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<tr>
<td>Profit before income tax (EBT)</td>
<td>614</td>
<td>583</td>
<td>465</td>
<td>663</td>
<td>1,582</td>
<td>1,962</td>
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<td>-505</td>
<td>-628</td>
<td>-895</td>
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<tr>
<td>Profit before non-controlling interests</td>
<td>447,80</td>
<td>378,37</td>
<td>281,03</td>
<td>392</td>
<td>1,077</td>
<td>1,335</td>
<td>2,133</td>
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<td>Profit attributable to non-controlling interests</td>
<td>-6,42</td>
<td>-17,62</td>
<td>-13,42</td>
<td>-22</td>
<td>-47</td>
<td>-66</td>
<td>-102</td>
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<tr>
<td>Profit attributable to equity holders of the parent</td>
<td>441</td>
<td>361</td>
<td>268</td>
<td>371</td>
<td>1,030</td>
<td>1,269</td>
<td>2,031</td>
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### Invested Capital (€ Millions)

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<tr>
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<tbody>
<tr>
<td>Fixed assets</td>
<td>5,425</td>
<td>6,052</td>
<td>6,182</td>
<td>6,439</td>
<td>7,089</td>
<td>7,939</td>
<td>8,865</td>
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<tr>
<td>Other noncurrent assets (liabilities)</td>
<td>-308</td>
<td>-320</td>
<td>-390</td>
<td>-403</td>
<td>-490</td>
<td>-588</td>
<td>-727</td>
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<tr>
<td>Working capital</td>
<td>434</td>
<td>848</td>
<td>750</td>
<td>776</td>
<td>733</td>
<td>729</td>
<td>857</td>
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<tr>
<td>Invested Capital</td>
<td>5,552</td>
<td>6,580</td>
<td>6,542</td>
<td>6,812</td>
<td>7,332</td>
<td>8,081</td>
<td>8,995</td>
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<td>Short term debt</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>Long term debt</td>
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<td>1,115</td>
<td>1,065</td>
<td>1,096</td>
<td>1,114</td>
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<td>Total debt</td>
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<td>3,877</td>
<td>3,718</td>
<td>3,816</td>
<td>3,876</td>
<td>4,060</td>
<td>4,083</td>
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<tr>
<td>Cash</td>
<td>188</td>
<td>3,819</td>
<td>3,801</td>
<td>3,813</td>
<td>3,831</td>
<td>3,843</td>
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<td>Total net debt</td>
<td>2,840</td>
<td>58</td>
<td>-83</td>
<td>3</td>
<td>45</td>
<td>217</td>
<td>202</td>
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<td>Total shareholder’s equity</td>
<td>2,711</td>
<td>6,522</td>
<td>6,625</td>
<td>6,809</td>
<td>7,287</td>
<td>7,864</td>
<td>8,793</td>
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<tr>
<td>Capital employed</td>
<td>5,552</td>
<td>6,580</td>
<td>6,542</td>
<td>6,812</td>
<td>7,332</td>
<td>8,081</td>
<td>8,995</td>
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### Cash Flow (€ Millions)

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</thead>
<tbody>
<tr>
<td>EBIT</td>
<td>639</td>
<td>627</td>
<td>547</td>
<td>776</td>
<td>1,698</td>
<td>2,090</td>
<td>3,120</td>
</tr>
<tr>
<td>Income Taxes</td>
<td>166</td>
<td>204</td>
<td>184</td>
<td>271</td>
<td>505</td>
<td>628</td>
<td>895</td>
</tr>
<tr>
<td>Notional Tax</td>
<td>173</td>
<td>204</td>
<td>184</td>
<td>271</td>
<td>505</td>
<td>628</td>
<td>895</td>
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<td>NOPAT</td>
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<td>423</td>
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<td>505</td>
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<td>1,462</td>
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<td>Amortization, depreciation and impairment loss on tangible assets</td>
<td>331</td>
<td>405</td>
<td>411</td>
<td>486</td>
<td>534</td>
<td>638</td>
<td>860</td>
</tr>
<tr>
<td>Provision and impairment loss on receivables</td>
<td>83</td>
<td>28</td>
<td>29</td>
<td>29</td>
<td>37</td>
<td>71</td>
<td>95</td>
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<tr>
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<tr>
<td>Result in Associates</td>
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<td>73</td>
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<td>74</td>
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<td>75</td>
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<tr>
<td>Net Cash Flow from Operating Activities</td>
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<td>929</td>
<td>877</td>
<td>1,094</td>
<td>1,839</td>
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<td>Capex</td>
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<td>536</td>
<td>736</td>
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<td>1,463</td>
<td>1,759</td>
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<td>Provision and impairment loss on receivables</td>
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<td>28</td>
<td>29</td>
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<td>71</td>
<td>95</td>
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<td>Other Investments</td>
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<td>17</td>
<td>5</td>
<td>7</td>
<td>19</td>
<td>25</td>
<td>27</td>
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<tr>
<td>Net Cash Flow from Investing Activities</td>
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<td>-472</td>
<td>-798</td>
<td>-1,178</td>
<td>-1,555</td>
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<tr>
<td>FCF</td>
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<td>-545</td>
<td>405</td>
<td>296</td>
<td>661</td>
<td>691</td>
<td>1,247</td>
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Disclosures and Disclaimer

Research Recommendations

<p>| | |</p>
<table>
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<tbody>
<tr>
<td><strong>Buy</strong></td>
<td>Expected total return (including dividends) of more than 15% over a 12-month period.</td>
</tr>
<tr>
<td><strong>Hold</strong></td>
<td>Expected total return (including dividends) between 0% and 15% over a 12-month period.</td>
</tr>
<tr>
<td><strong>Sell</strong></td>
<td>Expected negative total return (including dividends) over a 12-month period.</td>
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</tbody>
</table>

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