

**MASTER OF SCIENCE IN  
FINANCE**

**MASTERS FINAL WORK  
PROJECT**

**EQUITY RESEARCH GALP ENERGIA SGPS SA:  
ESG APPROACH TO VALUATION**

**JOÃO CÉSAR GOMES TEIXEIRA**

**NOVEMBER 2020**

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**SUPERVISOR:  
VICTOR MAURÍLIO SILVA BARROS**

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## Abstract

This project covers a comprehensive financial analysis of Galp Energia S.G.P.S., S.A. (GALP.LS). It was conducted following the ISEG's Master in Finance final work standards and written following the guidelines from the CFA Institute Research Challenge. GALP is a Portuguese Integrated Oil & Gas company, with a significant presence throughout the industry value chain. This company is present in some of the most profitable Upstream projects in the world and has been the market leader in Portugal in its Downstream segment with more than 40% of its market share. A Free Cash Flow to the Firm approach was used to reach a BUY recommendation with a 2020YE price target of €12.06/sh, implying a +26% upside potential from the March 9th, 2020 closing price of €9.58/sh. The original research is complemented in the current work to address the increasing demand of the market for the integration of ESG criteria in the valuation of companies. By using a Value Driver Adjustment (VDA) approach, we manage to achieve the best of both worlds: the use of deep-rooted valuation practices (Value Drivers) and Socially Responsible practices integration in the valuation. Through our analysis we concluded that the company's ESG policies gives them a competitive advantage over its peers in certain parameters, leading to an increase in its valuation of €0.73/sh.

The information used throughout this report was publicly available as of March 9th, 2020. Thus, any information or subsequent events have not been considered.

JEL classification: G10 ; G32; G34; G35, G38

Keywords: Equity Research; Valuation; Discounted Cash Flow; ESG; Value Driver Adjustment

## Resumo

Este projeto contém uma análise financeira abrangente da Galp Energia S.G.P.S., S.A. (GALP.LS). Foi realizado de acordo com os padrões do trabalho final de Mestrado em Finanças do ISEG e escrito de acordo com as orientações do CFA Institute Research Challenge. A GALP é uma empresa portuguesa integrada de Petróleo e Gás, com uma presença significativa em toda a cadeia de valor da indústria. Esta está presente em alguns dos projetos de Upstream mais rentáveis do mundo e tem sido líder de mercado em Portugal no segmento de Downstream, apresentando mais de 40% da quota de mercado. Através da utilização de um modelo DCF, foi obtida uma recomendação de COMPRA com um preço alvo € 12,06 por ação para o final do ano de 2020, implicando um potencial de crescimento de 26% a partir do preço de fecho de 9 de março de 2020. A pesquisa original foi complementada no trabalho atual de forma a considerar a crescente curiosidade do mercado pela integração de critérios ESG na avaliação de empresas. Usando uma abordagem de *Value Driver Adjustment*, conseguimos alcançar o melhor dos dois mundos: utilização de práticas de avaliação bem enraizadas (*Value Drivers*) e a integração da análise das práticas de Responsabilidade Social nessa mesma avaliação. Através desta análise, concluímos que as políticas de ESG dá à GALP uma vantagem competitiva sobre seus pares em certos parâmetros, levando a um aumento da sua avaliação de € 0,73/ação.

A informação utilizada ao longo deste relatório estava disponível publicamente a 9 de Março de 2020, pelo que qualquer informação ou eventos subsequentes não foram considerados.

Classificação JEL: G10 ; G32; G34; G35, G38

Palavras-Chave: Equity Research; Avaliação de Empresas; DCF; ESG; Responsabilidade Social; Value Driver Adjustment

## Acknowledgements

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*“Some nights I wish I could go back in life. Not to change things, just to feel a couple things twice.”*

*Aubrey Drake Graham*

## Disclosure

A significant portion of this report was submitted by a group of students from ISEG, including the candidate, for the 2020 CFA Institute Research Challenge Portuguese Local Final. Upon winning the local final, the same report advanced as the representative report for CFA Society Portugal in the 2020 EMEA Regional Final in Jordan.

This report is published for educational purposes by Master students at ISEG and is not an investment recommendation. This report must be read with the Disclosures and Disclaimer at the end of this report. Appendices that support this report may be obtained from the author upon request.

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Date: January 2<sup>nd</sup>, 2020  
 Ticker: GALP.LS (Reuters)

Current Price: EUR 14.98  
 EUR 1.000: USD 1.121

Recommendation: **BUY** (21% Upside) High-Risk  
 Price Target: **EUR 18.1** (USD 20.3) 2020YE

Table 1: GALP's Market Data

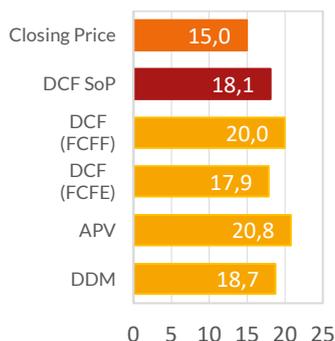
| Market Profile                            |             |
|---|-------------|
| Closing Price (January 2nd, 2020)         | 14.98       |
| 52w Price Range                           | 12.4 - 15.4 |
| 52w Daily Volume                          | 1.5M        |
| Shares Outstanding                        | 829.3M      |
| Market Capitalization (January 2nd, 2020) | 12.4B       |
| Free Float                                | 59.2%       |
| Dividend Yield <sup>2020YE</sup>          | 4.4%        |
| ROE <sup>2020YE</sup>                     | 16.6%       |
| D/E <sup>2020YE</sup> (Mkt Value)         | 0.7         |
| P/BV <sup>2020YE</sup>                    | 2.5         |
| P/E <sup>2020YE</sup>                     | 39.8        |

Source: Thomson Reuters, Team Estimates

## GALP: Extracting value from its ESG practices



Figure 1: GALP's Price Target (€)



Source: Team estimates

Figure 2: GALP's Price Target with Multiples



Source: Team estimates

Table 2: Industry's Abbreviations

| Abbreviations |  |
|---------------|--|
| bbl           | Barrel of Oil                              |
| kb/d          | Thousand bbl per Day                       |
| mb/d          | Million bbl per Day                        |
| boe           | Barrel of Oil Equivalent                   |
| mboe          | Million boe                                |
| kboe/d        | Thousand boe per Day                       |
| mton          | Million Tonnes                             |
| mta           | Million Tonnes per Annum                   |
| IOC           | Integrated Oil Company                     |
| NOC           | National Oil Company                       |
| WIP           | Working Interest Production                |
| FPSO          | Floating Production Storage and Offloading |

Source: Team estimates

## Research Snapshot

**BUY** is our recommendation for Galp Energia S.G.P.S., S.A. (GALP) with a price target of €18.1/sh for 2020YE using a DCF model, implying a 21% upside potential from the January 2<sup>nd</sup>, 2020 closing price of €14.98/sh, but we assess it as high-risk. GALP is an Integrated Oil Company (IOC) operating mainly in 6 countries across all Oil & Gas segments. We see a leading company in Portugal, with a solid market share above 40% in the downstream, while being present in several and profitable exploration projects worldwide. With a stable 2020F cash flow yield around 7%, the company will keep growing robust driven by its increasing production, supported by the oil and gas demand outlook. We see GALP as a buy stock because it is Strong, Strategic and Sustainable.

**Strong**, due to its cash flow generation from all segments, but mostly from the Upstream business. Sales from this segment grew strong +22.5% CAGR from 2015 to 2019E and are expected to grow further +7.0% until 2025, fueled by its E&P projects. By being an IOC, there is a natural hedging effect that partially protects the firm's strong cash flow generation. **Strategic**. GALP shows how they operate businesses by having stakes in some of the most profitable exploration projects in the world, mainly the Lula field in Brazil and the Rovuma in Mozambique. The company is highly dependent on oil, being the primary cash flow driver. Yet, the CAPEX allocation for the G&P segment doubling is a step towards a more sustainable portfolio. **Sustainable**. is in the pole position in the Dow Jones Sustainability Index between its peers, ranking 1<sup>st</sup> in the DJSI Europe for Oil & Gas (3<sup>rd</sup> place at global level). Furthermore, the company is also financially sustainable. Operationally, GALP has a strong financial discipline, setting a max of 2.0x for Net Debt/EBITDA, currently at 0.9x 2019E, giving room to embrace new projects.

**ESG Approach to Valuation**. One of Finance's hottest topic in the past decade is how the Environmental, Social and Governance practices of a company can influence their valuation. Using the Value Driver Adjustment (VDA) approach, we manage to achieve the best of both worlds: deep-rooted valuation practices (Value Drivers) and Socially Responsible practices integration. Through this approach we will adjust the company's main Value Drivers based on the company competitive advantages/disadvantages when comparing its ESG practices with the ones from the rest of the industry. When applying this method to GALP we concluded that the company's practices will have material impact in three value drivers: the lower Environmental Exposure in the Upstream leads to a decrease in costs (+ €0.76/sh); the lower Social Exposure in the Downstream leads to an increase in sales (+ €0.79/sh) and the higher Governance Exposure in both segments lead to an increase in cost of capital (- €0.82/sh). By the VDA Approach we manage to gather a bigger understanding around the company's ESG practices and further confirm our Buy recommendation, as the PT went from €12.06/sh to €12.79/sh.

Table 3: Sensitivity Analysis on Oil Price

| Oil Price 2025F | 66.0  | 66.5  | 67.0  | 67.5  | 68.0  | 68.5  | 69.0  | 69.5  |
|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Price Target    | 16.10 | 16.60 | 17.10 | 17.60 | 18.10 | 18.60 | 19.10 | 19.60 |
| Upside/Downside | 7.5%  | 10.8% | 14.2% | 17.5% | 20.8% | 24.2% | 27.5% | 30.8% |

Source: Team Estimates

Figure 3: Sales & EBITDA 2018



Source: GALP

Figure 4: GALP's Main Upstream Locations



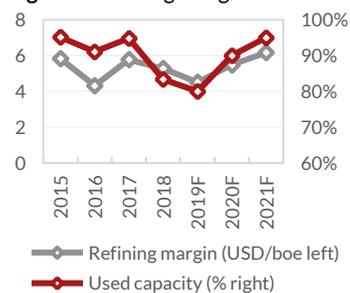
Source: GALP, Team Analysis

Figure 5: E&P Sales vs WIP



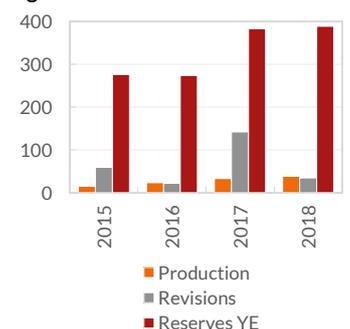
Source: Galp & Team Estimates

Figure 6: Refining Margin and % Used



Source: GALP

Figure 7: Revisions and Production



Source: GALP (kboe)

## Business Description

Galp Energia S.G.P.S., S.A. (GALP) is a leading Portuguese IOC. The company operates within the oil and gas value chain, both in Upstream, by searching, recovering and producing crude oil and natural gas (NG), and in Downstream, with refining and commercialization. The Upstream (Exploration & Production or E&P) is GALP's value driver with €1.7 bn 2018 sales, representing 11% of total sales, and EBITDA of €1.4bn, contributing 70% to company's 2018 EBITDA. The Downstream has two segments: the Refining & Marketing (or R&M) segment, with €12.8bn sales, accounting for 73% 2018 sales; and the Gas & Power (or G&P) segment, that recorded sales of €2.9bn, only contributing 5% to the company's EBITDA. GALP's 2018YE revenue of €17.2bn places the company among the top 15 largest oil and gas players in Europe.

### History of the company

GALP's history goes back to 1976 when the merger of the four largest Portuguese players in the oil sector originated Petrogal, the leader in the R&M sector. Its position as the leading player in Portugal was consolidated in 1999, by the aggregation of Petrogal and GdP (Gás de Portugal), establishing Galp Energia. In 1982, the company entered the E&P segment with the acquisition of a stake in block 1/82 in Angola. GALP started its strong development in the E&P business in 2007, with the largest ultra-deepwater oil discovery of the last 30 years in block BM-S-11 Lula/Iracema in Brazil. From there onward, the company has been highly focused on growing this segment. The E&P's sales growth skyrocketed at +23.1% CAGR, from €140 million to €1.69 billion 2006-2018, making the segment the main contributor of GALP's EBITDA. In recent years, the company entered a B2C business in the electricity sector.

### Operational segments

**E&P** | GALP's E&P sales are fueled by the average daily production (WIP of 107 kboe/d 2018YE). In 2018, with a \$15/boe increase in GALP's oil and gas average selling price and the preservation of production costs, the segment registered a positive YoY change in its EBITDA of 70% to €1.44 bn.

Currently, E&P sales come mostly from projects in Brazil, with GALP's operations in Angola showing a temporary slowdown, with blocks 14/14k in production decline and block 32 in ramp-up. The segment's value driver is the Lula-Iracema project, with a production of 98 kboe/d 2018YE (91% of total WIP). This project alone accounts for 8% (€1.42bn) of GALP's total sales. The next big project is expected to be Mozambique's Rovuma Liquefied Natural Gas (LNG). This new project signals GALP's aim in reducing the dependency of its operations in oil production, and, consequently, increasing the stability of the energy mix. It will be mainly through Rovuma LNG that GALP will achieve its 25-30% target for NG contribution in the company's WIP 2030F.

**R&M** | GALP's R&M sales increased in 2018 (1.6% YoY), mainly explained by higher Iberian energy demand. Nonetheless, maintenance operations in the refineries, accompanied by higher oil prices, led to a decrease in the company's refining margin by \$0.8/boe YoY to \$5.0/boe. Subsequently, the margins were profoundly affected, which resulted in a 17% YoY decrease in the R&M EBITDA to €0.6bn.

GALP is responsible for 20% of the Iberian Peninsula refining capacity, presenting a combined installed capacity of 330 kb/d. GALP is the leading player in the retail network in Portugal (c.40% market share), and a significant one in the Iberian market (9% market share). In Portugal, GALP possesses the total refining capacity through its refineries in Sines and Matosinhos. GALP's marketing segment is responsible for the commercialization of refined products. It sold 16.8 mton of oil products in 2018YE (-7.6% YoY), explained by the decrease in refineries' used capacity from 95% to 83%. Direct sales account for 51% of marketing sales in 2018YE, 61% of which correspond to wholesale operations (+2% YoY). Exports are the runner-up with a c.29% of marketing sales in 2018YE.

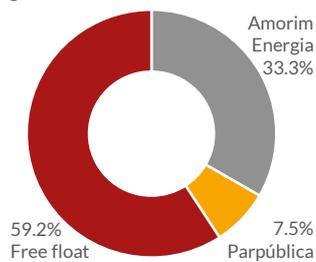
**G&P** | GALP's G&P sales increased 11% YoY 2018YE to € 2.9bn, mainly explained by the +8% YoY in NG sales to direct clients and the +7% YoY change in electricity sold to clients. The amount of electricity sold to the grid decreased by 14%, but the effect on sales was greatly offset by the previously mentioned increases in sales. There was a small impact on its EBITDA, increasing only 4% YoY.

Most of the sourcing of NG comes from long-term contracts in Algeria (Sonatrach) and Nigeria (Nigeria LNG). However, GALP expects to sign a contract in 2022 with a US company, to diversify its portfolio through an increase in trading activity. GALP leads the supply to industrial and large consumers in 3Portugal with 61% of total NG sales. Regarding Power, a significant part of the electricity sold to the grid comes from cogeneration units in the refineries. Nonetheless, aligned with its low carbon strategy, the company is actively working on the development of solar and wind power generation projects.

### Key drivers of profitability

**Oil and gas prices** | GALP is highly exposed to commodity prices, as a variation of \$5/bbl reflects a ΔEBITDA of around €200m. The upstream segment is more sensitive than the downstream. However, with a portfolio breakeven of \$25/bbl due to investments in the most profitable projects in the pre-salt region, the company has a reasonable margin against oil prices decrease. This low value is mostly achieved by the high profitability of Lula-Iracema projects, driven mainly by low production costs. 2018YE oil prices of \$62.6/bbl (+31.5% YoY) and expectations for 2025F at \$65-70/bbl show good promise for GALP'S future.

Figure 8: Shareholder Structure



Source: GALP

Table 4: Executive Committee

| Executive Committee     |                                   |
|-------------------------|-----------------------------------|
| Carlos Gomes da Silva   | Vice-Chairman, CEO                |
| Filipe Crisóstomo Silva | CFO                               |
| Thore E. Kristiansen    | COO (Upstream)                    |
| Carlos Costa Pina       | COO (Infrastructure)              |
| José Carlos Silva       | COO (Midstream)                   |
| Sofia Tenreiro          | COO (Comercial)                   |
| Susana Quintana Plaza   | COO (Renewables and New Business) |

Source: GALP

Table 5: Non-Executive Directors

| List of Non-Executive Directors |               |                    |
|---------------------------------|---------------|--------------------|
| Paula Amorim                    | Amorim Group  | Chairwoman, NED    |
| Miguel A. Marques               | LID           | Vice-chairman, NED |
| Marta Amorim                    | Amorim Group  | NED                |
| Francisco T. Rêgo               | Amorim Group  | NED                |
| Carlos Pinto                    | Sonangol E.P. | NED                |
| Luís Todo Bom                   | Independent   | NED                |
| Jorge S. de Freitas             | Amorim Group  | NED                |
| Diogo M. Tavares                | Amorim Group  | NED                |
| Rui P. Gonçalves                | Amorim Group  | NED                |
| Edmar de Almeida                | Independent   | NED                |
| Cristina N. Fonseca             | Independent   | NED                |
| Adolfo M. Nunes                 | Independent   | NED                |

Source: GALP

Notes: LID – Lead Independent Director

Figure 9: Governance Structure



Source: GALP

**WIP and reserve levels** | GALP's upstream sales are also dependent on reserves and the ability to turn them into WIP. The company must simultaneously maintain a reasonable level of reserves that will assure the sustainability of the E&P segment. GALP's reserves have been increasing mostly via revisions of project's estimates. WIP has been in an upward trend, with a +24% CAGR 2014-2018. The average WIP should reach 223 kboe/d by 2025F, higher by 115 kboe/d (+ 11% CAGR) 2018YE.

**Company Strategies**

**Upstream and Downstream: different focus** | GALP's strategy in the upstream is to develop its current portfolio. The company targets highly profitable and low-risk projects levered by competitive advantages in its current geographies.

In the downstream, the focus is to increase the efficiency of the refining system and to optimize the distribution of oil products in Iberia and Africa. GALP also aims to take advantage of existing opportunities in the global energy markets and grow as a gas supplier.

**Energy Transition** | GALP has already started the shift towards sustainable energy sources by focusing on NG and power generation through electricity (G&P segment). Also, measures are being taken to reduce the carbon intensity of its assets despite the focus of strategies on oil and NG. GALP aims to allocate 5-15% of its CAPEX to increase its market share in the G&P segment, develop new solutions and explore business projects supported by low-carbon energy (currently focusing on solar).

**Financial Discipline** | GALP's Net Debt/EBITDA 2018YE is 0.8x, with a maximum for this ratio set at 2x. This financial discipline allows the company to keep its focus on current objectives and decide upon new projects, not jeopardizing the future. Nowadays, GALP has room to undertake new projects as they come and to sustain the attractive dividends, even in a lower-profits scenario.

**Dividend policy** | The company has a strong commitment to its dividend policy aiming to increase the DPS around 10% per year, with its distribution depending on the capital structure, the cash flow generation and value-adding investments. GALP's DPS in 2018 was €0.6325 (15% increase YoY), to be paid semiannually. The total cash paid reached €525m, representing a payout ratio of 74% and an attractive 5% dividend yield.

**Shareholder structure**

GALP has 92.5% shares quoted in the market and the remaining 7.5% indirectly held by the Portuguese state through Parpública. Its largest shareholder is Amorim Energia B.V. with 33% of shares. The remaining shares account for 59%, mostly held by institutional investors from around the world. Individual investors account for 2% of GALP's share capital. Currently, GALP does not hold treasury shares. However, until October 2020, the BoD may proceed to an acquisition of up to 10% of GALP's capital, following a General Meeting decision from 2019Q2. Major shareholders may be allowed to divest through this mechanism.

**Governance**

Ms. Paula Amorim is GALP's chairwoman since 2016, after succeeding her father in the role. Before, she was the vice-chair and has been in the company's Board since 2012. She is also part of the family that owns Amorim Energia B.V. Since 2015, GALP's CEO is Mr. Carlos Gomes da Silva, a 52-year-old engineer with an MBA from ESADE, with over 30 years of experience, mostly in the energy sector. Throughout the years he took different roles in several divisions of GALP and most recently acted as COO in two distinct business units before being appointed CEO. The remaining 6 executive members have a similar academic background and relevant tenure in the company (Appendix 24).

**Board Structure and Remuneration Policy**

The Board of Directors (BoD) is composed of 19 members, including 12 Non-Executive Directors (NED), 5 of whom are independent (Table 5). In compliance with the By-laws, the Remuneration Committee is controlled by 3 shareholders not belonging to the Board (The remuneration policy is mixed. The remuneration policy is mixed. A fixed amount is paid to NED, while executive members get a fixed component plus a variable, based on the annual and three-year performance levels (Appendix 24). The former accounts for half, being 65% based on yearly value-added, total shareholder return and EBITDA, while the remaining 35% are of qualitative nature. Additionally, there is a retirement savings plan, equaling 25% of the fixed part.

The board turnover in 2019 was positive for gender equality. Women on Board increased from 2 to 5, with 2 of them being appointed to the executive committee, which was previously wholly composed by men. GALP's diversity policy is set from top to bottom.

**Governance Model and Shareholders**

GALP's governance model separates powers between different corporate bodies to ensure the transparency and effectiveness of governance. The Anglo-Saxon model is followed, and members are elected for a 4-year term. The Corporate Governance Code (CGC) of the Portuguese Institute of Corporate Governance (IPCG) is the benchmark in the country, to which GALP adopts 49 of the 60 recommendations. This represents 82%, which is close to 84% of average adoption from companies in the PSI20.

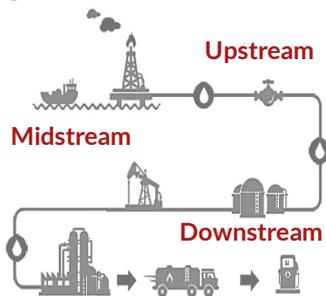
The By-laws of the company foresees a one-share-one-vote principle, without limiting voting rights. With an average 77% of the capital attending the Shareholder Meeting, Amorim Energia B.V. may exert

**Table 6: Key ESG Metrics**

| Governance Metrics                              |      |
|---|------|
| Metric  | GALP |
| Shareholder Meeting Attendance (3-year average) | 77%  |
| Independent Directors                           | 26%  |
| CGC Compliance                                  | 82%  |
| Average Tenure (years)                          | 5.8  |
| DSJI Europe                                     | 1st  |
| DSJI World                                      | 3rd  |
| ESG Score                                       | 67th |
| Environmental Pillar Score                      | A+   |
| Social Pillar Score                             | A-   |
| Governance Pillar Score                         | C    |

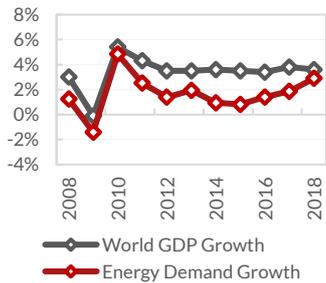
Source: GALP, Thomson Reuters

**Figure 10: Oil Value Chain**



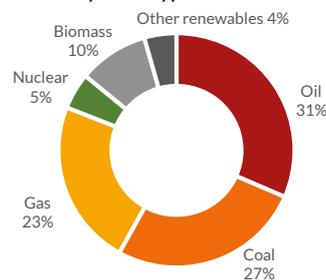
Source: Allied Consultants

**Figure 11: Global GDP & Energy Demand Growth**



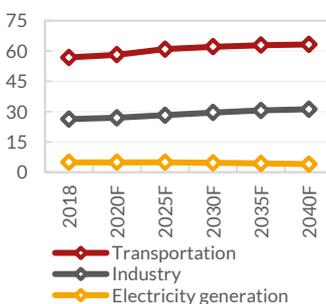
Source: IMF, BP & Team Estimates

**Figure 12: 2018 World Energy Demand by Fuel Type**



Source: OPEC

**Figure 13: Sectors in Oil Consumption**



Source: OPEC (mb/d)

relevant controlling voting power. Furthermore, most shareholders' resolutions only require a simple majority (exception relates to the company's Management; amendments to By-laws; and company transformation/mergers). Additionally, the chairwoman and 5 NED have links to Amorim's business, increasing, even more, the influence of this company over GALP. The second-largest shareholder is the state-owned holding Parpública, and it is not directly represented in the BoD, despite the 7.5% stake.

The evident influence that Amorim Energia B.V. has over the BoD may increase the apparent absence of protection that minority shareholders have over the group's decisions. The Amorim family has shown a commitment for a stable and robust dividend policy in companies other than GALP (e.g., Corticeira Amorim SGPS SA), thus mitigating potential value extraction effects, not expected to put growth opportunities at risk. Still, we believe that the current governance structure of GALP does not jeopardize our buy recommendation.

**(Going) Sustainable and (being) Socially Responsible**

In the Dow Jones Sustainability Indices (DJSI), GALP ranks 1<sup>st</sup> in the DJSI Europe for Oil & Gas (3<sup>rd</sup> place at a global level). Awards for sustainability are recurring and GALP's Thomson Reuters ESG score of 44.8 (Table 6), in line with Oil & Gas companies (median of 41.7). The score is timid, yet the company is the only one that received an A and A- classification from CDP in the categories of water security and climate change, respectively.

Social responsibility is also in the company's DNA. In 2009, the Galp Foundation was born. Governed by the Chairwoman, CEO and CFO, with a total budget of €19.4m in 2018, the Foundation targets project in areas such as Social Development, Energy and Environment and Education and Culture, operating in Portugal, Guinea-Bissau and Mozambique. Currently, the leading project is "Energiza" which aims to install a photovoltaic system to provide access to energy in Mozambique. The location of this project signals a clear concern with the communities where the company operates. GALP is at the forefront regarding sustainability and social responsibility, yet new challenges such as the energy transition will put the company to the test.

**Industry Overview and Competitive Positioning**

The Oil & Gas industry operates around the value chain of fossil fuels. It starts in the Upstream sector (E&P), covering all activities of searching, recovering, and producing crude oil and NG. Entering this segment requires participating in each producer country's bidding rounds, which is extremely capital intensive (Appendix 21). On the opposite side of the chain, the Downstream sector (R&M and G&P) includes refining the crude oil, processing the raw NG, and covering marketing and distribution of their by-products, along with the production and commercialization of electricity. Both segments are supported by the Midstream, acting as the bridge between them, yet GALP is not intensively operating in this middle part. The Oil & Gas industry is the world's most profitable industry, according to Forbes. Aggregated profits increased YoY by 36% in 2018. Currently, global E&P alone represents 3% of the worldwide economy.

**World population, GDP Growth and Energy Demand** | The Oil & Gas industry will keep robust, as current levels of energy sources will be insufficient to meet increases in global energy demand. Increasing world population and expected economic growth are to blame. World population will increase by 21% until 2040, with this growth coming mostly from developing countries. Yet, growth rates will be decelerating. The global GDP growth is slowing down and is expected to be at 3.2% in 2019. With the stabilization of trade problems in the most developed countries by 2024, expected by OECD, the world's GDP growth should increase to 3.4% going forward. As in Figure 10, GDP growth and energy demand are tied together. Supply has a role to play.

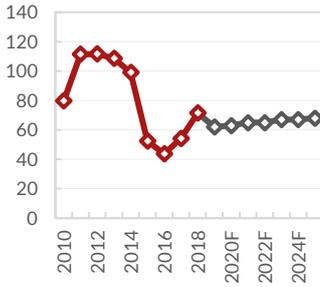
**International Outlook: GALP's Upstream Outlook**

There is a common misconception about the looming energy transition – the focus will shift entirely to low carbon alternatives and renewable energy. However, fossil fuels are responsible for more than 50% of the world primary energy demand. Despite the transition, fossil fuels are expected to maintain its dominant share in the decades to come.

**Energy Demand Growth** | According to the International Energy Agency, world energy consumption was 286 mboe/d 2018YE, with oil, coal and NG representing 32%, 27% and 23%, respectively. Energy demand is expected at 358 mboe/d by 2040, representing +1% CAGR, mainly driven by the upward trend in urbanization and population growth in developing countries. But the global energy mix will change over this period. Even with oil demand continuously increasing, its contribution to the world's primary energy demand is expected to decrease by around 3%. Still, the fuel will keep leading the energy mix (28%). The predicted increase in NG demand will turn it the world's second most consumed source (25% 2040F), surpassing coal. Renewable sources will also climb in the mix because of declining production costs. It will make renewables more competitive than ever. Over the next decade, they will register the fastest percentage growth whereas NG will grow the most in volumetric terms.

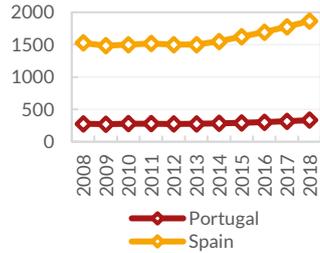
**Oil Demand Drivers** | Oil demand was 99 mb/d 2018YE, and it is expected to reach 111 mb/d by 2040 (+0.5% CAGR). The decelerated growth over the next years is mainly due to lower global GDP growth, improved energy efficiency and continued substitution of oil. Yet, none of the issues above should reverse the outlook for energy demand. The sectors with the biggest footprint on demand are transportation, industry (mainly petrochemicals) and electricity generation. All transportation types take the largest portion of current global oil demand, accounting for about 58%. This share is expected to remain stable

**Figure 14: Brent Price (\$)**



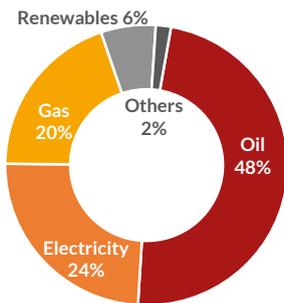
Source: Reuters, Deloitte

**Figure 15: Iberian Energy Demand**



Source: BP (mboe)

**Figure 16: Iberian Energy Mix in 2020F (outside) vs 2025F (inside)**



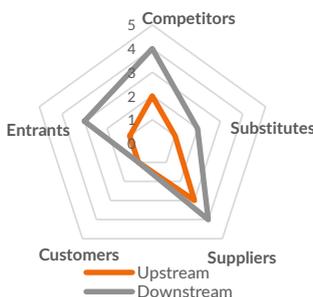
Source: European Commission

**Figure 17: Refineries in Iberia**



Source: INE, Team Analysis

**Figure 18: Porter's Five Forces**



Source: Team Analysis

until 2040. The electricity generation is the one that should offset oil demand trends, decreasing by 1 mb/d by 2040.

**OPEC |** The cartel is composed of 14 of the world's largest oil-exporting nations. Together they are responsible for around 42% of total world oil production and 80% of the global proved oil reserves. They exert power in the sector. OPEC can change production to influence the global supply and thus oil prices. Current tensions in the middle east yield volatility to the sector, but we foresee that cartel's share will keep robust.

**World Liquids Supply |** World liquids supply is expected to reach 105.0 mb/d in 2024, growing at +1.0% CAGR. It includes crude oil, natural gas liquids, biofuels and other liquid. Non-OPEC liquid supply represents about 63% of the total supply and is expected to fall to 60% by 2040. This decrease will take place after the expected non-OPEC supply peak around 2026, followed by the US supply, both reaching peaks by the same time. After that, OPEC expects that Brazil will lead the supply growth among non-OPEC members, with 1.9 mb/d.

**Oil Prices |** Crude oil prices are extremely volatile and heavily affected by exogenous variables (Figure 14). Forecasting is not easy. Currently, the US shale oil production, the US crude oil stocks, and the OPEC oil supply are the main elements weighting price expectations - these are controlling forces of the global oil supply. Fluctuations in oil prices may occur for several reasons. Historically, the major price crashes occurred following either OPEC or US oversupply. Therefore, a healthy demand growth aligned with OPEC maintaining discipline over its production levels is expected to result in average prices of \$65-70/bbl 2021E.

**Oil in Brazil |** Brazil's total production was 2.6 mb/d 2018YE and expectations from ANP point to a total output of 7.5 mb/d by 2030. The country is expected to be within the Top 8 world's oil producers by 2040, fueled by its offshore potential. Lula and Iracema, located in the pre-salt Santos basin, are considered one of the most significant and most productive deep-water oil discoveries in the world for decades. It currently has 9 FPSOs producing at plateau level, accounting for 1.5 mboe/d, more than half of Brazil's total output. GALP has a stake of 10% in Iracema area whereas for Lula the share decreased to 9.2%, after the approval of the unitization process in 2019 (a unitisation process was required as the Lula discoveries extended outside the area first licensed, towards the adjacent areas of South of Tupi, a Transfer of Rights area and an open area. The agreement determined the new stakes attributable to each party (Petrobras, Shell and GALP)). Through its Brazilian subsidiary, Petrogal Brasil, GALP is the 3<sup>rd</sup> largest producer in the country.

**NG in Mozambique |** Mozambique's current NG production of 0.2 tcf is expected to grow at +13.7% CAGR to 2.8 tcf by 2040. This will represent the world's sharpest growth rate, nearly 10x higher than the world's average of 1.4%. By 2030, Mozambique is expected to become the largest gas producer in sub-Saharan Africa, surpassing Nigeria. Mozambique's current NG proven reserves are of 2.6 tcf. Due to the discovery of over 180 tcf of NG proven reserves, the Rovuma basin will constitute the world's 4<sup>th</sup> largest offshore gas project, becoming a major exporter by 2023. This project will be focused on LNG, which consists of NG that is converted to a liquid state to facilitate transportation. GALP is part of the consortium operating in Area 4 with a 10% stake. The block (Area 4) will comprise the offshore Coral South, with production expected to start in 2022, and the onshore Rovuma LNG, which will fuel the increase in NG in GALP's portfolio by 2030.

**Domestic Outlook: GALP's Downstream Outlook**

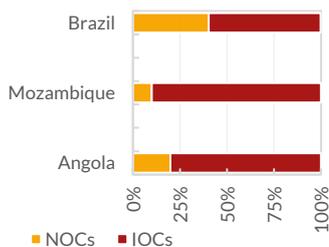
An increase in the demand for primary energy sources results from an increase in demand for by-products. The main measure of profitability in the downstream segment is the refining margin, defined as the difference between the price realized for the products to be sold and the cost of the crude delivered to the refinery.

**Iberian GDP Growth |** Both Portugal and Spain have been recovering from the financial crisis and subsequent sovereign debt crisis. Portugal's GDP is already reaching pre-crisis figures, while Spain is still on its path to a full recovery. In 2018, both countries grew similarly - GDP growth of 2.4% for Portugal and 2.6% for Spain. Yet, both rates are likely to decrease around 100 bps by 2024. A contraction in fixed investment and a decrease in net external demand should be the main slowdown drivers.

**Iberian Energy Demand |** Energy consumption in the Iberian market is mainly sourced by oil, accounting c.50% of the total. It is explained by the weight of manufacturing and transportation (c.65%). Both countries expect a drop in oil and oil by-products consumption by 203, because oil demand should decrease by 0.4% CAGR. However, oil will still lead the energy mix for this region (45% and 51% for Spain and Portugal, respectively). Electricity will continue to be the second most consumed energy for both countries, with its demand increasing 0.5% CAGR until 2030. The energy mix will be reshaped. The transportation sector is highly dependent on oil products, but Iberian countries also rely deeply on them <for heating or electricity generation. The consumption of NG products has been increasing significantly over the last years in Iberia. Authorities in both countries are encouraging the shift for cleaner energy sources with Portugal aiming an energy mix coal-free by 2030.

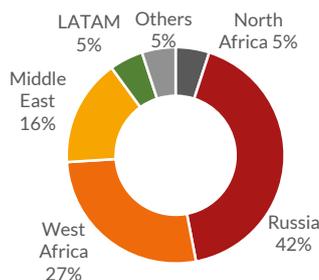
**Iberian Refining Capacity, Utilization and Margin |** There are 10 refineries in the Iberian Peninsula - 2 in Portugal, held by GALP, and 8 in Spain owned by Repsol, CEPSA and BP (Figure 17). In 2018, the total refining capacity was 1894 kb/d and average utilization rate 85%. GALP's refining capacity of 330 kb/d accounts for 20% of the Iberian total and average utilization rate was 83% 2015-2018. In 2018 and 2019, this rate was negatively affected by maintenance operations in both GALP refineries, reducing the

**Figure 19: %NOC vs IOC in projects**



Source: Team Estimates

**Figure 20: Downstream Suppliers**



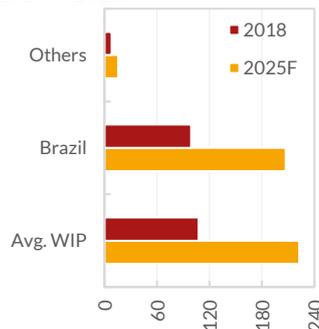
Source: GALP, Team Estimates

**Figure 21: OPEC Oil Production vs Brent Price**



Source: Team Estimates

**Figure 22: GALP's Average WIP 2018 vs 2025F**



Source: GALP, Team Estimates

refining margin. Now, GALP is fully operational. GALP's 2018 refining margin was \$5.0 per barrel, below Iberian average of \$6.2 per barrel. But the company targets a 2020 refining margin around \$6.0.

**Competitive Positioning**

The market for oil and gas is best described as oligopolistic. However, the upstream and downstream idiosyncrasies will influence the positioning of GALP. In the upstream, the company is a relatively small but very profitable player. In the downstream, the company is market leader in the retail segment. Prices in Portugal will be significantly defined by the crude price but also by the taxation imposed by the government. Product differentiation will be relatively similar in both ends of the value chain.

**Rivalry Among Existing Competitors** | In the Upstream, competitors' partner up with each other. CAPEX is massive and so, risk sharing is key. Companies share the control over blocks, as agreed in the bidding rounds, where they compete for a share on the projects. The rivalry between competitors is more significant in the Downstream. GALP faces fierce competition in a perfect competition Marketing segment in Iberia. The homogeneity of the oil derived products leads to stiff competition in attracting and retaining customers. Yet, the Refining segment is monopolistic in Portugal and oligopolistic in Spain (Figure 16). Only four companies have refining capacity in Iberia.

**Threat of Substitute Products** | Oil and Gas are expected to keep increasing demand, keeping the fitness of GALP's portfolio. As a Downstream player, GALP will be exposed to the new dynamics in the secondary energy sources as its operations are connected to oil by-products and electricity. GALP's portfolio is mainly focused on oil by-products, but the presence in the electricity segment ensures some protection.

**Bargaining Power of Customers** | The main customers of the Upstream are the players in the Downstream. Usually, IOCs sell to other OCs. GALP does not fuel the downstream with the oil produced in the upstream, as it is a financially IOC. Other players work similarly, so they have to resort to the open market. Either way, customers will have small influence setting prices. Regarding the Downstream, end consumers are highly dependent on oil and gas by-products and, consequently, have no relevant pricing power.

**Bargaining Power of Suppliers** | Governments can influence the bidding rounds related to reserves in their country. Usually, the preferred conditions and a higher percentage of the projects are attributed to their NOCs. As governments influence the share each company controls in the blocks, they also affect the companies' amount of crude oil for the E&P. In the Downstream, we find suppliers in two parts of the value chain. First, the Upstream players which supply oil to refineries. GALP is exposed to their power because the company buys oil in the open market. Yet, this exposition will be naturally hedged at group level by their Upstream operations. Second, the refineries that supply by-products to the marketing segment. In this case, GALP runs the two existent refineries in Portugal, being the leading supplier. Therefore, we expect suppliers to exert medium-high bargaining power.

**Threat of New Entrants** | Operating in the Upstream segment requires know-how and investment capacity. New joiners are unlikely because knowledge is critical, while the high CAPEX needs may benefit from economies of scale. The uncertainty around E&P projects also makes it difficult for new companies to justify high licensing fees, resulting in a low threat of new entrants. In the Downstream segment, the risk coming from new entrants is dissimilar. In the Marketing segment, it is high, while low for the Refining. The investment needed to build a Refinery is massively higher than running service stations. Yet, GALP's reputation is an asset.

**Investment Summary**

Our recommendation for GALP stands at BUY, with a 2020YE target price of €18.1/sh, representing a 21% upside potential to the company's stock price of €14.98/sh at January 2<sup>nd</sup>, 2020, but with high-risk. The mispricing is expected because of current uncertainties. GALP is trading at a discount against our target price because of concerns around oil prices volatility. The high potential of growth for the WIP in the Upstream (+10% CAGR 2019-2025), combined with the leading position in Portugal in the Downstream (>40% market share), and the recovery in the R&M (\$6.3/boe 2020F refining margin) should drive GALP's price up during the year. Value from the upcoming project for NG in Mozambique accounts for €0.90/sh in our estimations, but cash will only flow starting in 2025.

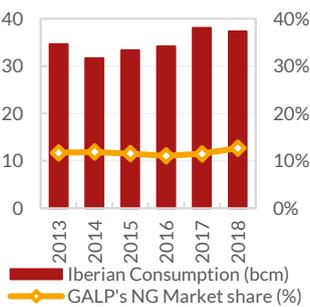
**Key-Value Drivers**

**Strategic Management of the E&P Portfolio:** There is risk, yet diversification is strategical to the company. GALP's E&P portfolio, with a breakeven of \$25/boe, gives the company a safety net against oil prices fluctuations. The presence in the Brazilian pre-salt, considered the benchmark worldwide, drives most of the company's E&P production and economic profit.

The accelerated production growth in ongoing projects (+24% CAGR 2015-2018) placed the company as the 3<sup>rd</sup> largest producer in the region. We forecast that GALP will maintain its strong position. The historical growth comes from the addition of 2 FPSOs during 2017-2019. The 9 FPSOs can easily increase up to 11 until 2025F because GALP and their partners in the area plan to increase the recovery rate of discovered resources from 37% to 40%. We expect an increase in production in the Lula-Iracema projects (130 kboe/d 2020F), keeping the lead of GALP's WIP and sustaining the attractive breakeven.

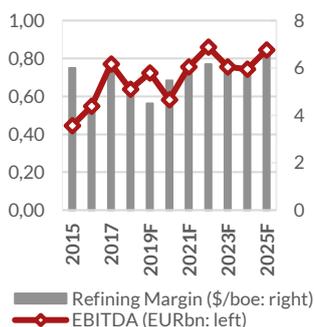
The projects in Mozambique will enter capital intensive phases in the new NG explorations. The Coral South FLNG and Rovuma LNG will add to the company's sustainability. Recent acquisitions in the area lead us to believe that GALP's stake in the Rovuma LNG could value up to €1.1bn in run rate.

**Figure 23: Iberian NG Consumption V GALP's NG market share**



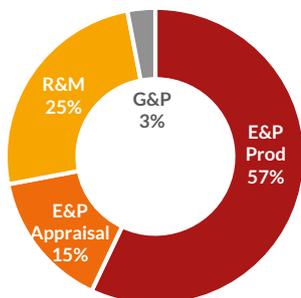
**Source:** BP, GALP, Team Estimates  
bcm: billion cubic meters

**Figure 24: Refining Margin vs. R&M EBITDA**



**Source:** GALP, Team Estimates

**Figure 25: CAPEX Allocation 2025F**



**Source:** Team Estimates

**Figure 26: GALP's Price Target (€)**



**Source:** Team Estimates

**Strong Synergies in the R&M Segment:** GALP is the undisputed Portuguese market leader in refining and marketing. The dominant position should be maintained, growing steadily as the demand in the Iberian market increases. Margins in 2019 dropped due to maintenance operations. Now GALP is ready to pick up the refining margin from \$4.5/bbl 2019E to about \$6.2/bbl by 2022F.

Refining Sales depend on the used capacity of the 2 refineries, with the estimated average rate 2019E-2025F converging to a historical top of 91% (2015-2018). The marketing segment should benefit from the Refining unit improvements as the result of synergies that come from the operational vertical integration. This unit is expected to grow steadily to match energy demand (1.7% GAGR 2018-2025F), averaging 3% EBITDA margin 2019E-2025F.

**Growing Sustainability through G&P |** GALP is an IOC but is making efforts to become an Integrated Energy Company. CAPEX will play a role in the efforts. The company will grow its share in electricity generation and gas supply to bring more sustainable sources to the portfolio. Renewables, mainly solar, will be key for the company. We expect increases in sales of electricity to the grid, powered by energy generation in refineries and investment in renewable sources (1.7% CAGR 2018-2025F). We also expect stable growth from the supply, as GALP's 12% market share in Portugal is here to stay. The trading activities are expected to significantly increase in 2021F, because a new NG contract will increase the tradeable NG by 30%. The segment's cash flow generation is timid compared to other segments but is the more stable and sustainable.

**Strong financial position; short, medium- and long-term focus |** GALP's strong cash-flow generation from operations leads us to believe that GALP is in an interesting position. Economies of scale allow the company to increase its production levels and decrease OPEX, even in the absence of new projects. Yet, this fact is not stopping the company to keep searching for new investments: the new LNG projects in Mozambique brings a new energy source, a new location and adds to the sustainability of the portfolio. We believe that GALP will keep searching for new opportunities in this segment, with at least 12% of the CAPEX of the company being allocated in Exploration and Appraisal. Moreover, the G&P segment has a role to play in the long run for the company. Our analysis considers increases in energy demand from renewables in Iberia. GALP is investing now to prepare for the future, more than doubling their CAPEX for this segment.

The strategic management of the company, along with the strong synergies and strong financial position, we believe that GALP is a buy stock, despite the relevant risks. Also, investing in GALP today should secure a dividend yield of 7-8% 2025F.

#### Valuation methods

We used a DCF model based on a SoP FCFF by segments to achieve a price target of €18.1/sh. To complement our analysis, we run alternative valuation methods (Figure 26), all of them yielding price targets with upside. First, a DCF based on a global FCFF, reading €19.5/sh. Second, an FCFE approach with upside to €17.9/sh. Also, the DDM because of the company's focus on the dividend policy. The dividend approach points to a price target of €18.7/sh. The constant debt level led us to forecast GALP's target price using the APV approach, yielding €18.2/sh. Lastly, multiples. However, approaches of multiples per segment or considering GALP as a whole point to unreliable figures. Different risks in the segments make it difficult to assess the company through peers. The market has been trading GALP with a premium to its peers. All targets include an additional €0.9/sh from the new projects in Mozambique starting in 2025, although based on conservative transaction multiples.

#### Risks to achieve the price target

Investors must be aware of the impact of commodity prices, as GALP's biggest driver to E&P's value. Sales are directly linked to oil and gas prices. Increasing importance and reliance on Brazilian operations (98% of WIP 2020E) entail the risk of impacting profitability as a result of regional misbalances, although some comfort comes from the LNG production starting soon in Mozambique. Additionally, FX should be taken into account, as the industry operates in USD, but GALP consolidates EUR. Our recommendation is set with a long run Brent price of about \$68/bbl.

## Valuation

### Free Cash Flow to the Firm: A Sum-of-the-Parts Approach (SoP)

We value GALP using a Discounted Cash Flow (DCF) method. The unique characteristics of GALP's segments allow us to value them separately and follow a FCFF (SoP) approach. Additional approaches are used to complement our base model (overall FCFF, FCFE, APV, DDM and Multiples). Our SoP approach yields a 2020YE price target of €18.1/sh (Appendix 15). This price target includes an additional € 1.05/sh that accounts for a conservative approach on the valuation of the Rovuma LNG project.

We follow the same valuation technique for each operational segment, applying a two-stage growth model that considers detailed annual FCFF forecasts for the 2019-2025F period and assuming a constant growth rate for the perpetual period. The main assumptions inherent to our FCFF valuation relates to forecasting sales and costs for each segment are below.

**Table 7: GALP's SoP Price Target**

| Segment                        | Model | g     | %     | EUR       |
|--------------------------------|-------|-------|-------|-----------|
| E&P                            | FCFF  | 2.75% | 66.3% | 13 440.67 |
| R&M                            | FCFF  | 1.70% | 23.3% | 4 731.62  |
| G&P                            | FCFF  | 1.70% | 10.3% | 2 093.92  |
| Adjustments                    |       |       |       | 6 123.42  |
| Equity Value                   |       |       |       | 14 142.79 |
| Shares Outstanding             |       |       |       | 829.25    |
| Price Target 2020YE without Mz |       |       |       | 17.05     |
| Mozambique                     |       |       |       | 1.05      |
| Price Target 2020YE with Mz    |       |       |       | 18.1      |

Source: GALP, Team Estimates

**Table 8: WACC E&P, R&M and G&P**

| E&P                    | 2020E  | Terminal Value |
|------------------------|--------|----------------|
| Equity (Market Values) | 79.93% | 80.00%         |
| Debt (Market Values)   | 20.07% | 20.00%         |
| WACC                   | 9.78%  | 9.82%          |

| R&M                    | 2020E  | Terminal Value |
|------------------------|--------|----------------|
| Equity (Market Values) | 79.93% | 80.00%         |
| Debt (Market Values)   | 20.07% | 20.00%         |
| WACC                   | 6.56%  | 6.51%          |

| G&P                    | 2020E  | Terminal Value |
|------------------------|--------|----------------|
| Equity (Market Values) | 79.93% | 80.00%         |
| Debt (Market Values)   | 20.07% | 20.00%         |
| WACC                   | 4.64%  | 4.64%          |

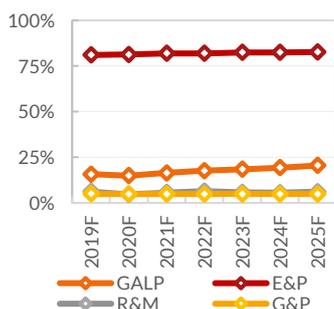
Source: Team Estimates

**Table 9: Rovuma LNG**

| Mozambique                        |               |               |
|-----------------------------------|---------------|---------------|
| Acquisition                       | Exxon         | Total         |
| Area                              | Area 4 Rovuma | Area 1 MZ LNG |
| Capacity (mta)                    | 15.2          | 12.9          |
| Stake bought                      | 25.0%         | 26.5%         |
| Price paid (mUSD)                 | 2 800         | 3 900         |
| P/mta (mEUR)                      | 614.4         | 1 015.4       |
| Galp ownership in mta             |               | 1.5           |
| Galp Stake in mEUR                | 933.9         | 1 543.3       |
| Galp MZ value (mEUR)              |               | 1 238.6       |
| Value per share (EUR/sh)          |               | 1.49          |
| Uncertainty factor                |               | 30%           |
| Addition to price target (EUR/sh) |               | 1.05          |

Source: GALP, Team Estimates

**Figure 27: Forecasted EBITDA Margin**



Source: Team Estimates

**Upstream: Main cash-flow driver**

WIP and oil prices drive the sales. We forecast that GALP's WIP will grow at a 10.8% CAGR 2019-2025F, reaching 223 kboe/d, doubling the WIP of 2018. Growth is high, but reasonable. Production in Brazil is the main contributor, yet operations in Africa are also expected to grow until the end of the decade.

The Average Selling Price (ASP) will likely increase, as most forecasts indicate an increase in the Brent price (\$68/boe 2025F), with sales reaching €3.6bn by 2025F, yielding a 12.3% CAGR 2019-2025F. Since most of the production will still come from Brazil, it is expected that the production costs and royalties will be relatively stable throughout the forecast. Thus, we expect EBITDA margin to follow the historical trend, averaging 81% 2020-2025F.

**Brazil** | This location will keep being GALP's biggest value driver, with an increasing number of FPSO's in its current projects. Most of the projected growth of the WIP comes from the Brazilian pre-salt, that also benefits from low costs (the breakeven from this region is around \$30/bbl). At least 3 new blocks will start production until 2023F, but the main contributor to the company's WIP will come from the Lula-Iracema block. If all the FPSOs installed in Brazil by 2025F would be in plateau the WIP could reach 231 kboe/d by 2025F. Although, decreases in the capacity of older FPSOs are expected, so we estimate that Brazil operations will contribute with 207 kboe/d (93% of the WIP).

**Angola** | Blocks 14 and 14k in Angola are declining, whereas a new block is now in production - Block 32. This block will keep the contribution from Angola relatively stable. GALP expects Angola's production to represent around 1% of total WIP by 2025.

**Mozambique** | Gas reserves in the Rovuma Basin are among the biggest ever found. Here Galp has two projects: Coral FLNG, that starts production in 2022 and Rovuma LNG that starts in 2025. These projects will add up to the company energy mix, but we consider that the target of 70% oil and 30% gas mix will only be achieved later in this decade. For our forecast we consider gas to account for 12% in the mix.

To properly capture the potential of Rovuma project, we decided to value GALP's stake separately based on recent transactions. There are the two transactions we deemed considerable: one from Exxon and one from TOTAL. Although this second is in a different block, it is in a surrounding area. This valuation yielded an additional € 1.05 to the price target (Table 9 - Appendix 18).

**Downstream: One part leading, one part growing**

GALP operates in a mature market with a rather stable growth. Sales growth are forecasted to follow Portugal's economy. Different assumptions were used for the two segments. GALP's strong position in both segments lead us to a less conservative approach.

**R&M** | GALP is market leader in this segment where competition is fierce. In the refining business unit (BU) GALP's installed capacity gives them an advantage over their rivals, with the ASP expected to increase due to the increase in Brent Price. We forecast that the Refining Margin will increase when compared with historical values, averaging \$5.8/boe for 2020-2025. The sales from the marketing BU will be linked to the demand in the Iberian market. Knowing that the energy demand is linked with the GDP growth, we expect that sales will increase in average 1.7% in 2019-2025F. The operational improvements in the segment will lead to a 6.4% CAGR 2019-2025F of the EBITDA. More detailed information about Refining and Marketing can be found in Appendix 9.

**G&P** | GALP's two main BUs in this segment are the Supply & Trade of NG and the supply of Power. The Supply & Trade of NG sales will be linked to the increase in demand of NG in Portugal and the amount of tradeable NG that GALP has available. The NG demand in Portugal is expected to be 1.8% per year and the tradeable NG will increase significantly in 2022F. The power demand in Portugal is expected to increase 1.41% but GALP power unit is likely going to grow above it based on its investments in the renewables sector. This segment will represent the smallest contribution for the companies' cash flow generation, but the low capital needs and the relatively high stability of the segment will turn the segment into a valuable asset for the company, with its significance expected to grow throughout the decade. More detailed information about the Gas and Power can be found in Appendix 10.

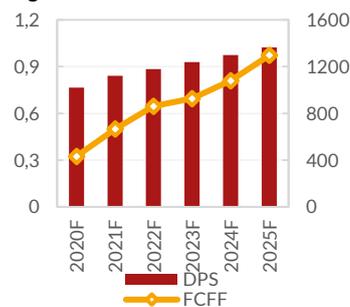
**Capex and D&A**

Considering the historical investment and the company's targets for CAPEX, we see an increase for all segments, all for different reasons, always above € 1bn, even reaching almost 1,2 in 2023F. Includes IFRS 16 effects. E&P CAPEX is the most demanding, consuming around 70% of the total. R&M segment will have a significant decrease in their CAPEX since historically most of its expenditures come from maintenance operations. No further operations are expected to happen throughout the forecast horizon. D&A rates for each segment are obtained via historical percentages, but differently for all segments, as some also consider production. More detailed information about the Upstream can be found in Appendix 11.

**Weighted Average Cost of Capital**

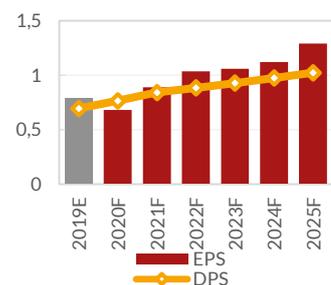
To discount FCFF we used four different WACC rates in order to account for different risks in operations and countries. We followed the CAPM approach for the computation of the **Cost of Equity**. As a proxy for the RFR we used a 10-year normalized 10Y German Government Bond Yield and added a CRP for Portugal and Brazil. Betas for the segments were estimated by computing unlevered betas for all segment peers and adjust them for GALP's capital structure and tax rate. Cost of equity ranges between 5.2% and 10.5%. To compute GALP's **Cost of Debt** we considered, again, the 10-year normalized 10Y German Government Bond Yield as the RFR, added the CRPR and, although GALP is not rated by rating agencies,

**Figure 28: Dividend vs FCFF**



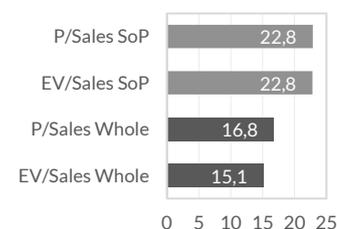
Source: Team Estimates

**Figure 29: Dividend Policy**



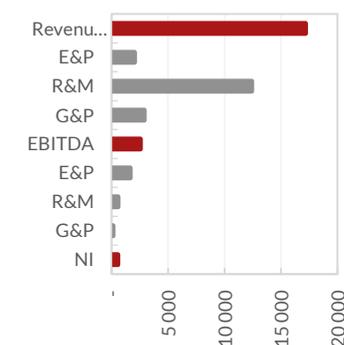
Source: Team Estimates

**Figure 30: Multiples Valuation**



Source: Team Estimates

**Figure 31: P&L Breakdown 2020YE**



Source: Team Estimates

we decided to add a spread of 75b.p. - according to a synthetic rating of AAA. Adjusting for taxes, we reached an after-tax cost of debt of 2.3%. Both cost of equity and cost of debt are expected to remain constant for the duration of the forecasted period, meaning that changes in WACC will only arise from changes in the capital structure.

**FCFE and DDM**

These complementary approaches are an interesting proxy to our price target of €18.1/sh. In the case of FCFE, it is supported by the stable capital structure the company has maintained and is expected to maintain. The use of the DDM is justified with the stable dividend payment of the company.

**Dividend Policy**

GALP aims at a 10% YoY dividend growth from 2019 to 2021. We deem this increase until 2021F feasible, reaching almost € 0,85/sh. From 2021 onwards, we set a 5% YoY growth that will reach a bit above €1 in 2025, representing a 6,6% CAGR 2019-2025F. In Figure 29, we can see a sustainable Payout ratio.

**Peer's Selection**

For GALP's peer group selection, 2 approaches were followed, consistently with our perspective so far: one group through a SoP and another looking at the company as a whole. For both approaches, we first narrowed the comparable companies based on their geographical location and then considering the similarity of various key financial results. We reached 7 peer companies for the company as a whole and never less than 4 per segment, considering the SoP (Appendix 19).

**Relative Valuation**

We used Relative Valuation Multiples as a complementary valuation method to the DCF, considering EV/Sales and P/Sales multiples. GALP is trading at a premium based on both multiples, EV/Sales (which is mainly explained by its potential to grow as a consequence of its high profitability E&P projects. Using EV/Sales we reach a price target of € 15.10/sh whereas the P/Sales yields a price of € 16.78/sh, which sustains our buy recommendation using DCF approach (Appendix 20).

**Financial Analysis**

**Strong Cash Flow Generation** | Despite the general public idea, we believe that oil and gas companies will stay for good. Due to GALP's ability to generate strong CF from operations, its FCFE will increase in the 2019-2025F period (+25% CAGR). The company also presents high liquidity, mostly due to the significant levels of cash holdings. GALP should pay attractive dividends, keeping debt at low levels and still managing the working capital efficiently to present a current ratio of 1.7x to 1.8x in the upcoming years. Cash from operations will also be enough to offset demanding CAPEX requirements of up to €1.2 bn/year.

**Mature industry, stable financials** | Pricier R&M will affect performance. Net increase in R&M deteriorates inventory turnover, although the cash conversion cycle will stabilize around 75 days. The mature nature of the business, both in the Upstream and Downstream segments, does not require relevant working capital adjustments. Also, efficiency levels will keep stable. Asset turnover of around 1.2x is within the historical range and above peers.

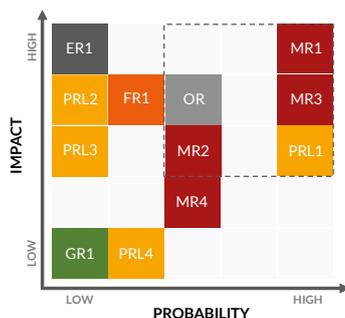
**Debt management** | GALP's debt level is below the industry average. This does not come with a surprise, as the company is among the more profitable IOC players and has proved itself to generate stable cash flows. Book D/E is around 0.71x, while peers set the level below at 0.49x. Again, we believe that future investments are not at risk because the company can easily fund new projects with outside capital. The EBITDA margin, along with low leverage, put the debt coverage above 10x with room to improve to 16x by 2025F. Net Debt/EBITDA is comparable across the industry and GALP shows a ratio that is very close to its peers, despite the higher leverage. The ratio of 0.9x contrasts with peers 1.0x. Figures do not lie when it comes to showing how GALP is sustainably managing debt.

**Profitability** | E&P revenues are fueled by 2P Reserves (755 mmmboe 2018YE) and average WIP (107 kboe/d). In 2018, with a \$15/boe increase in GALP's oil and gas average selling price and the preservation of production costs, the company registered a positive YoY EBITDA margin to c.70% or €1.44 bn. In the coming years, the margin in the segment is expected to evolve positively to 83% 2025F.

Regarding revenues of the R&M segment, they increased in 2018, mainly due to higher ASP (c.27% YoY). This factor, aligned with higher maintenance operations in the refineries, led to a decrease in the company's refining margin of \$0.8/boe YoY to \$5.0/boe 2018YE. Consequently, margins were heavily affected in that year, resulting in a 17% YoY decrease in the R&M EBITDA to EUR 637mn, with margin of 5%. We take a conservative approach and forecast margins to be stable at 6% going forward.

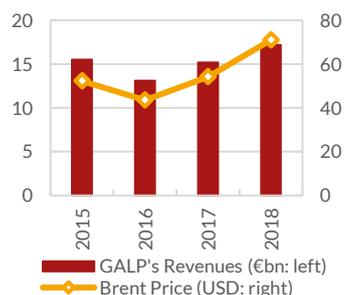
**G&P** revenues increased 11% YoY to €2.9 bn 2018, mainly explained by the +8% YoY in NG sales to direct clients and the +6.7% YoY change in electricity sold to clients. The amount of electricity sold to the grid decreased by 14%, but the previously mentioned increases in sales offset much of its effects on the revenues. These changes had a small impact in the segment's EBITDA, increasing only 3.8% YoY and setting the margin at 5% 2025F.

**Figure 32: Risk Matrix**



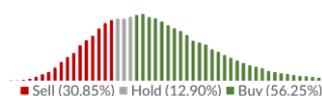
Source: Team estimates

**Figure 33: GALP's Rev. vs Brent Price**



Source: GALP, Thomson Reuters

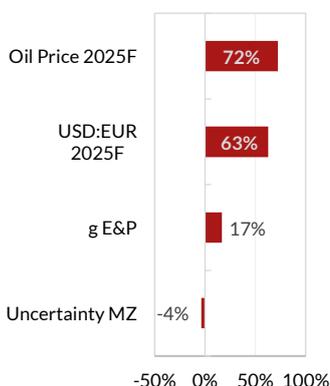
**Figure 34: Monte Carlo Simulation**



Mean: 18.45; Median: 18.01

Source: Team Estimates

**Figure 35: Monte Carlo Simulation Variables**



Source: Team Estimates

All segments make a positive whole. GALP's overall profitability is showing an upward trend since 2015. EBITDA is expected to continue evolving at +8.5% CAGR 2019-2025F, exceeding the 4% CAGR for sales. Figures are already accounting for IFRS 16 effects starting in 2019. Operational profit will grow 9.5% CAGR, regardless of operational costs increases over the years, due to augmented production and sales. The growth and later stability in generating profits will allow growing dividends distribution.

**ROE at unusual levels** | All drivers above will set GALP's ROE averaging 18% 2019-2025F. Yet, shareholders' value in the company will also reflect the dividend distribution. Shareholders can also assess value creation through the average EVA® of about €1.0 bn 2019-2025F. Peer's average ROE 2019F of 11.5% show GALP's strategic way of operating businesses. The main driver for a better outlook for GALP is the operations in the Lula-Iracema region that are among the most profitable blocks worldwide, and with room to grow.

## Investment Risks

### Market Risk | Commodity Prices (MR1)

Commodity prices are unavoidable risks for Oil and Gas companies. GALP is highly exposed to both oil and NG prices, as any change in these variables directly affects the company's sales for both Upstream (selling price of extracted products) and Downstream (buying prices of raw material plus its effect on the by-products). Prices are mostly affected by market dynamics which GALP cannot influence.

By being an IOC, there is a natural hedging effect that works as a risk mitigating factor. Simultaneously, the risk will be softened by the use of derivatives.

### Market Risk | Exchange Rates (MR2)

GALP operates in several locations. It is mostly exposed to USD, the standard currency for the Oil & Gas industry, but also to BRL, as GALP's Brazilian subsidiary (Petrogal Brasil) reports in its domestic currency. Both Upstream and Downstream sales are sensitive to FX because GALP consolidates in EUR. The exposition to USD is unquestionably significant. We estimate a ΔEBITDA of €110-120m from a +0.05 (500 pips) variation in EUR: USD. The natural hedge that comes from the presence in the Upstream and Downstream will decrease the impact of the risk. GALP also manages to mitigate it at a corporate level, mainly through derivatives.

### Market Risk | Energy Transition (MR3)

The worldwide economy is highly dependent on fossil fuels, but the expectation is for this dependence to decrease in the following decades. This decrease will come from the growth of renewable sources of energy generation and the substitution of fossil fuels for electricity, mostly in terms of transportation. The electrification of other industries is also unavoidable (e.g. construction). The other big shift in the energy segment will be the surpassing of coal by NG as the second most used fossil fuel. This is aligned with the expected evolution in GALP's WIP, where the current mix of oil and gas is 90% and 10%, respectively, and the expected mix is 70% and 30%. The company is trying to follow the trend of electrification to mitigate energy transition risks through investments in the renewable energies' segment (10 to 15% of CAPEX).

### Operational Risk | E&P Uncertainty (OR)

The selection of E&P projects is fundamental for IOCs, but this process encompasses a relevant uncertainty to predict the economic value. If the company manages to efficiently select its projects, it still has to overcome the possible problems that will arise with their execution, development and operation. Too many projects without commercially recoverable reserves might weight heavily on the balance sheet and jeopardize the whole group. This risk is highly diminished by the strategic choices of the company, with most of the projects being explored in locations where the company and their partners are already experienced (i.e. ultra-deep waters). The use of new technologies, e.g. AI, to diminish the uncertainty risk has become the norm in the industry. GALP is following suit, working with IBM to enhance seismic interpretation.

### Political, Regulatory and Legal Risks | IMO 2020 and Paris Agreement (PRL1)

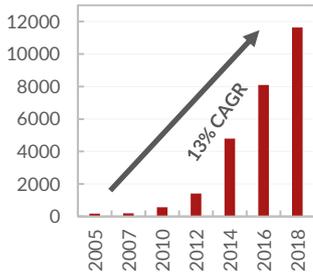
High-sulfur fuel was very common for marine bunkers, and this type of fuel leads to both CO<sub>2</sub> emissions and high sulfur dioxides emissions. The latter is linked to acid rain and lung cancer. IMO 2020 will limit the global bunker fuel to 0.5% sulfur content, lowering it from the current 3.5%. In 2018YE, marine bunkers represented 21% of the company's R&M wholesale unit. To comply with IMO 2020, GALP has already implemented the required changes in its refining processes. In the past years, GALP has also been adjusting its operations to reduce the GHG emissions as required by the Paris Agreement. In the case of new regulations, further changes will need to be made. These changes will lead to periods of maintenance and adaptation, negatively impacting usage capacity and refining margins, and, consequently, the profitability of the R&M segment. GALP is actively working to gradually diversify their portfolio, reducing the operational impact that more strict regulations would have.

**Table 10: Sensibility Analysis for the E&P Terminal Growth**

| Change in g     | -0.75% | -0.50% | -0.25% | 0%    | 0.25% | 0.50%  | 0.75%  |
|-----------------|--------|--------|--------|-------|-------|--------|--------|
| Price Target    | 17.00  | 17.32  | 17.69  | 18.10 | 18.57 | 19.12  | 19.75  |
| Upside/Downside | 13.5%  | 15.6%  | 18.1%  | 20.8% | 24.0% | 27.6%  | 31.9%  |
| Recommendation  | Hold   | Hold   | Buy    | Buy   | Buy   | Strong | Strong |

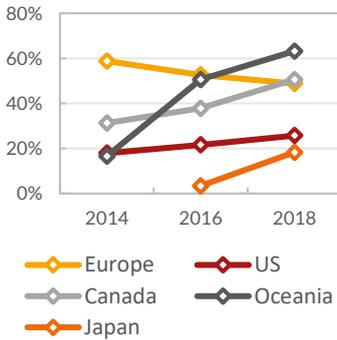
Source: Team Estimates

**Figure 36: ESG Investing by Money Managers in the US**



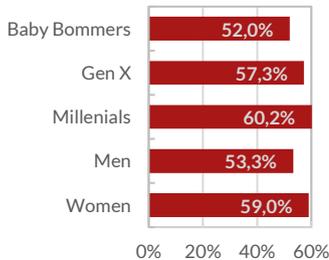
Source: US-SIF Foundation (USD bn)

**Figure 37: Proportion of SRI relative to total managed assets**



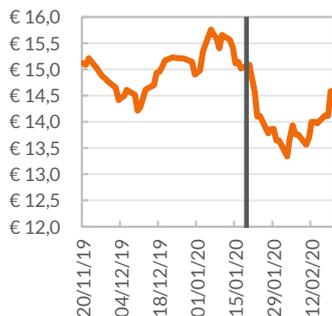
Source: Global Sustainable Investment Review

**Figure 38: Average Sustainability Preference Scores**



Source: Morningstar, J. Tucker III & S. Jones

**Figure 39: Impact of the controversy surrounding Isabel dos Santos' stake**



Source: Thomson Reuters, Team Estimates

**Table 11: Sensibility Analysis of FX and Oil Prices for 2025F and the Terminal Period**

|               | Price target | Oil Price 2025F |       |       |       |       |       |       |       |       |       |       |
|---------------|--------------|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|               |              | 65.00           | 65.50 | 66.00 | 66.50 | 67.00 | 67.50 | 68.00 | 68.50 | 69.00 | 69.50 | 70.00 |
| USD-EUR 2025F | 18.10        | 14.63           | 14.87 | 15.12 | 15.37 | 15.62 | 15.88 | 16.15 | 16.41 | 16.68 | 16.96 | 17.23 |
|               | 0.85         | 15.10           | 15.35 | 15.60 | 15.85 | 16.11 | 16.37 | 16.64 | 16.91 | 17.18 | 17.46 | 17.74 |
|               | 0.86         | 15.57           | 15.82 | 16.08 | 16.33 | 16.59 | 16.86 | 17.13 | 17.40 | 17.68 | 17.96 | 18.24 |
|               | 0.87         | 16.04           | 16.29 | 16.55 | 16.81 | 17.07 | 17.34 | 17.61 | 17.89 | 18.17 | 18.45 | 18.74 |
|               | 0.88         | 16.51           | 16.76 | 17.02 | 17.29 | 17.55 | 17.83 | 18.10 | 18.38 | 18.66 | 18.95 | 19.24 |
|               | 0.89         | 16.97           | 17.23 | 17.50 | 17.76 | 18.03 | 18.31 | 18.59 | 18.87 | 19.15 | 19.44 | 19.74 |
|               | 0.90         | 17.44           | 17.70 | 17.97 | 18.24 | 18.51 | 18.79 | 19.07 | 19.35 | 19.64 | 19.94 | 20.23 |
|               | 0.91         | 17.90           | 18.17 | 18.44 | 18.71 | 18.98 | 19.27 | 19.55 | 19.84 | 20.13 | 20.43 | 20.73 |
|               | 0.92         | 18.36           | 18.63 | 18.90 | 19.18 | 19.46 | 19.74 | 20.03 | 20.32 | 20.62 | 20.92 | 21.22 |
|               | 0.93         |                 |       |       |       |       |       |       |       |       |       |       |

Source: Team Estimates

## ESG Approach to Valuation

### ESG Investing: The new promised land

One of Finance's hottest topic in the past decade is how the Environmental, Social and Governance practices of a company can influence their valuation. GALP's Thomson Reuter ESG Score is remarkably strong, scoring an A+ in the Environmental Pillar, an A- in the Social Pillar and a more modest C in the Governance Pillar. However, how these scores are reflected in a company valuation isn't always clear. The maximization of shareholder value has been for years the focus for businesses, but there's seems to be shift into a more holistic view on how a company should operate (J. Tucker III & S. Jones, 2020). The way companies interact with all its stakeholders is becoming a concern. Nowadays investors care not only about profit, but also about the impact of those companies in the environment and the communities around them. Thus, reporting ESG practices is one way to show investors if companies are walking their talk. However, the way in which these reports are incorporated in the valuation of companies is not always clear.

This shift in focus of companies is mirrored by the increase in investment that is classified as ESG investing. As stated by Tucker III and Jones (2020), ESG investing is seen as the process of using environmental, social and/or governance criteria in order to either help in the valuation of investments or to understand their impact in the societies and environments in which they operate.

As reported by the The Forum for Sustainable and Responsible Investment (US SIF) (2018), assets selected through ESG criteria are growing at a 13% CAGR from 1995 to 2018 in the United States. On the other side of the Atlantic, Socially Responsible Investment (SRI) assets comprised 48,8% of professionally managed assets in 2018, way above the US's 25.7% (GSI Alliance, 2019).

This growth has the potential of becoming even bigger, as studies have been pointing that the stereotyping of ESG investors as females and millennials is wrong and may be limiting ESG investing (Morningstar, 2018; Cerulli Associates, 2019). Men, Gen-Xers and Baby Boomers present a similar appetite to ESG investing and will possibly contribute to the increase in demand when advisors offer them the option to do it. When, to this, we add the more than probable transfer of capital from the Silent Generation to these three in the next decade, there's a clear upside potential for the demand of ESG investing (Responsible Investment Association, 2019; Srinivas & Goradia, 2016).

### Connecting ESG with Finance: The Value Driver Adjustment Approach

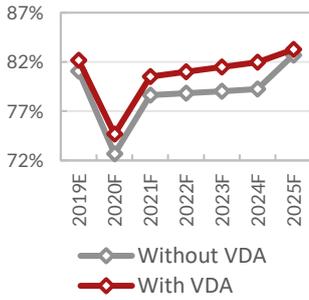
Even though the numbers seem promising, the truth is that there are still problems with the so called ESG investing. The main one is that most of the time the approaches to integrate ESG in investment decisions seems to be too superficial. There's a clear preference for a screening and exclusion practice, where assets are accepted or rejected based on their ESG practices. However, this method does not capture these ESG practices in the valuation process per se. Through a Value Driver Adjustment (VDA) approach, developed by Robeco Asset Management, we will manage to create a link between ESG factors to the value drivers of a company, based on the materiality that these factors could have in the company financials (Schramade & Robeco Asset Management, 2016).

This method requires first to understand the most relevant stakeholders of a company, in order to identify the most material issues for the company. Afterwards it should be assessed how the company manages to perform under each of these issues and the consequent impact of its management. Is in this part of the process that the review of the ESG reporting from the company is fundamental. Only after this, it should be determined if the company manages to derive a competitive advantage or disadvantage from their managing of these issues and how will this affect its value drivers. The main value drivers will be revenue growth, margin development, invested capital needs and risk (discount factor) (Schramade & Robeco Asset Management, 2016).

### Material Impact of ESG: The S&P ESG Oil and Gas Report

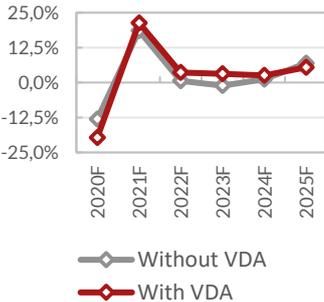
As previously stated, in order to understand how ESG affects the company's Value Drivers we need to determine the materiality that each ESG criteria brings to the company financials. In order to so, a valuable approach is to follow the "ESG Industry Report Card: Oil And Gas" (S&P Global, 2019). In it, the degree of exposure for each ESG criteria (for the Downstream and the Upstream) is valued from 1 to 6, being 6 the highest exposure possible. After understanding the degree of exposure for the industry, we can compare it to the degree of exposure that GALP has in each criterion. With this comparison, we can

**Figure 40: E&P EBITDA Margin With and Without VDA**



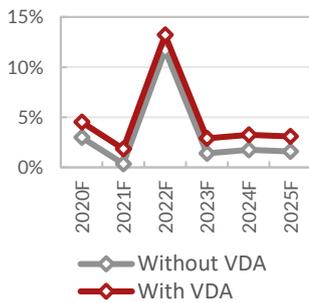
Source: Team Estimates

**Figure 41: R&M Sales Growth With and Without VDA**



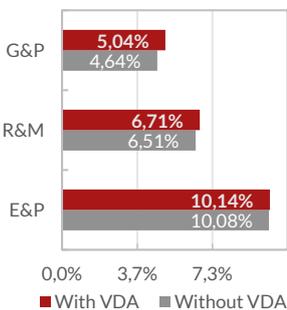
Source: Team Estimates

**Figure 42: G&P Sales Growth With and Without VDA**



Source: Team Estimates

**Figure 43: Segments' Terminal WACC with and Without VDA**



Source: Team Estimates

**Figure 44: Resulting PT with VDA**



Source: Team Estimates

then understand if GALP is in advantage or disadvantage when compared to the industry standard. Only then can we decide if there is a need to do an adjustment to the company's Value Drivers.

**Linking The Value Drivers with the company's ESG exposure**

From our analysis (which can be seen in detail in the Appendix 28) we reached valuable conclusions that helped us identify the Value Drivers that each risk had affected. In terms of the Upstream, the Environmental Exposure of the company seems to be a nudge better than the average IOC. Its better positioning in terms of carbon intensity should be considered and it can be expected to have a positive impact on the costs that the company incurs in its E&P operations, improving the segment margin development. The Social Exposure in this segment is on par with its peers, with the risk linked to consumer behavior being mitigated by the company investment in natural gas and renewables. In terms of Governance Exposure, the company has a clear problem with Isabel dos Santos' stake in its biggest shareholder, Amorim Energia. This risk leads to a material disadvantage for the company that should be taken into account on the company's cost of capital.

For the Downstream, the company's Environmental Exposure is aligned with the industry, with risks such as greenhouse gas emissions and pollution from the refining process, transport spills and water contamination coming from the company presence in all the elements of the Downstream Value Chain. However, the lack of history of major material problems, accompanied by the company work around cutting the gas emissions lead to a certain mitigation of these problems, giving GALP a positioning similar to the rest of the industry. The Social Exposure in the Downstream mainly comes from safety, social and consumer behavior risks. From our assessment, the only risk that bring material changes to GALP will be the latter. However, the heavy investment of GALP in the production of renewable energy and the distribution of it to vehicles, aligned with the major presence of GALP in Portugal and Spain lead us to believe that the company could get from this a better revenue growth in the BUs of this segment. The Governance Exposure will be similar to the one that the company faces in the Upstream, which means that an adjustment in the cost of capital of the BUs from this segment should be made.

**The Value Drivers Adjustments: What is the result of these changes?**

Starting with the adjustment that results from the company Environmental Exposure, we now see that GALP should have a decrease in costs throughout the years as a result of its positioning. With our previous approach the company had a 5Y EBITDA Margin average of 78,88%. With the adjustment that was made in the production costs, the 5Y EBITDA Margin average increased by almost 2%, to 80,72%. These changes would have a positive impact of €0.76/sh on the company's price target, increasing its Upside by almost 8%.

Our analysis of the Social Exposure from the Downstream lead us to believe that the company can extract material advantages over its peers because of its current position and heavy investment in renewables. In order to materialize this advantage in our valuation, an increase in the growth of sales of the Downstream BUs should be expected. We forecasted a sales 6Y CAGR of 1.74% for the R&M and 3.23% for the G&P. With the adjustments made, the sales 6Y CAGR slightly increased to 1.98% for the R&M and 4.48% for the G&P. These changes impacted positively the price target in €0.79.

Regarding the adjustment made due to the company's Governance Exposure, the approach was to adjust the company's Cost of Capital by increasing it by 0,25%. With this increase, we manage to capture the increase in return demanded by investors as a response to the uncertainty around Isabel dos Santos' position as a prominent shareholder. This change will make the WACC from all of the segments to change significantly, increasing in all of them as can be seen in the Figure 45. These changes had, as expected, a negative impact in the valuation, decreasing its price target by €0.82 and its upside by 8%.

**ESG Approach to Valuation: Is it worth it?**

When considering all of the Value Driver Adjustments that were made, our price target went from €12.06/sh (from our updated price target, see next page) to €12.79, increasing the Upside from 26% to 34%. Through this approach we managed to further support our buy recommendation.

Even though it may seem a small change, the changes that result from the VDA approach can lead to significant changes in the type of recommendation from an analyst. The changes in the type of recommendation and the inclusion of ESG elements in the Valuation are two clear advantages of this approach. It also showed that it could be a valuable asset in order to understand the risks that come from ESG, expanding behind looking into valuations made by third parties (e.g. Thomson Reuters) at face value as a way of screening and excluding companies. In a way, with this approach we possibly merge both worlds: deep-rooted valuation practices (Value Drivers) and Socially Responsible practices. Through this merger we can achieve a deeper understanding of a company, producing a more thorough Equity

Research, and tap into the growing demand for ESG investing. For future reference, we think that the approach could be further improved if the comparison between the company and its peers was made in a more direct way, instead of doing it through a comparison based on an industry report.

# University of Lisbon - ISEG

Oil & Gas

Portuguese Stock Exchange (PSI)

This report is published for educational purposes only by students competing in The CFA Institute Research Challenge

**GALP ENERGIA S.G.P.S., S.A.**

Date: March 9<sup>th</sup>, 2020

Current Price: EUR 9.58

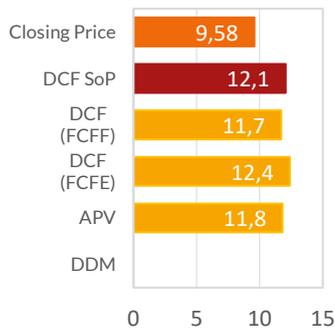
Recommendation: **BUY (26% Upside)** High-Risk

Ticker: GALP.LS (Reuters)

EUR 1.000: USD 1.145

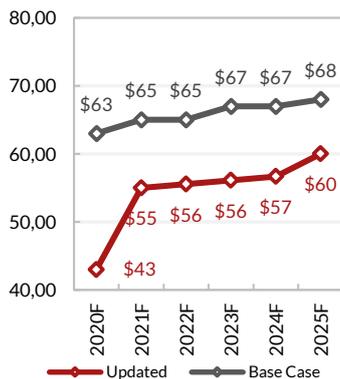
Price Target: **EUR 12.06 (USD 13.8)** 2020YE

Figure 45: GALP's Price Target (€)



Source: Team estimates

Figure 46: Oil Prices Forecast (\$/boe)



Source: Team estimates

Table 10: Industry's Abbreviations

| Abbreviations |  |
|---------------|--|
| bbl           | Barrel of Oil                              |
| kb/d          | Thousand bbl per Day                       |
| mb/d          | Million bbl per Day                        |
| boe           | Barrel of Oil Equivalent                   |
| mboe          | Million boe                                |
| kboe/d        | Thousand boe per Day                       |
| mton          | Million Tonnes                             |
| mta           | Million Tonnes per Annum                   |
| IOC           | Integrated Oil Company                     |
| NOC           | National Oil Company                       |
| WIP           | Working Interest Production                |
| FPSO          | Floating Production Storage and Offloading |

Source: Team estimates

## COVID UPDATE

### GALP: Still Strong, Strategic and Sustainable

We issue **BUY** recommendation in our updated equity research for Galp Energia S.G.P.S., S.A. (GALP), with a price target of €12.1/sh for 2020YE using a DCF model, implying a 26% upside potential from the March 9<sup>th</sup>, 2020 closing price of €9.58/sh, but we assess it as high-risk. Our additional valuation methods still support our updated valuation, with the exception of the DDM, with this method becoming an outlier, given GALP's dividend growth profile.

The first version of this report was finished in January 15<sup>th</sup>, 2020. Since then, the world has changed. The COVID-19 pandemic changed everything in our daily lives, and it also impacted the world economy like never before. Most of the global industries were negatively impacted by the pandemic, and the Oil & Gas industry was not an exception.

Firstly, all of the energy sector was negatively affected by the decrease in demand of all types of energy. Most countries applied some sort of lockdown, leading to a major crash in demand. Specifically, the oil industry suffered from all fronts. The decrease in demand for the final consumer, either households or businesses, made the need for refined oil products decrease. The decrease in the use of installed refining capacity all over the industry impacted negatively the need for the acquisition of oil, leading to a snowball effect that made the oil price reach historically low prices. Even though the problems inside the OPEC between Saudi Arabia and Russia were resolved, this settlement wasn't enough to offset the major impact that the pandemic had on the oil prices.

Due to the major impacts caused by the pandemic, the team made a new update in March, reflecting the new reality. We review our whole forecast to understand what the impacts on GALP's operations are. With that in mind, adjustments needed to be done. As seen in the figure X, our oil price forecast was adjusted in order to capture the new reality. Our average Brent price for our forecast period went from \$65.67 to \$54.50, with the 2020F being the one with the biggest adjustment, going from \$63.00 to \$43.00. There's an expectation that with the combination of the new agreement that the OPEC with the possible return to normal in the next couple of years the oil price will eventually recover to previous values. However, we decided that would be prudent to have a conservative approach, and in the terminal period our forecasted Brent Price registered a decrease of \$8.00, being fixed now at \$60.

Operationally, just a few adjustments were made. We strongly believe that the company has the capacity to quickly recover to previous operational levels, and so we forecasted that the main impact would be felt during this year. Accordingly, we made an adjustment for the growth in production in 2020 for the E&P segment (from 12% to 7%) but maintained the growth that we forecasted for the rest of the years. We expected the R&M segment to be able to maintain its production levels, being mainly affected by the decrease in their refining margin, mainly explained by the decrease in the ASP. This decrease made the average Refining Margin for the forecasted period go from \$6.08/boe to \$4.53/boe. Dividends were adjusted for 2020, as we truly believe GALP will strategically adjust their financial decisions to the current moment. GALP's partnerships are important in a normal scenario, and even more important in crisis. By working together, all companies can assure that operations continue as planned.

Even with all the necessary adjustments that were made in order to capture new reality in which the company operates, we still see GALP as a strong, strategic and sustainable company. Due to a strong production portfolio that's able to add value even in situations of low oil prices, the company is strategically positioned to keep growing in the years to come, driven by its increasing production and investments in new BUs aligned with the upcoming Energy Transition, either in solar power with ACS or natural gas with Mozambique. That sets the base for a sustainable growth, both financial and environmentally, in the medium and long term.

# Appendices

## Appendix 1: Income Statement (GALP)

| Income Statement (mEUR)                         | 2017            | 2018            | 2019E           | 2020F           | 2021F           | 2022F           | 2023F           | 2024F           | 2025F           | CAGR<br>19-<br>25F |
|---|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|--------------------|
| <b>Operating Income</b>                         |                 |                 |                 |                 |                 |                 |                 |                 |                 |                    |
| Sales and service rendered                      | 15,201.0        | 17,182.0        | 16,206.5        | 17,177.4        | 18,349.0        | 18,959.4        | 19,339.7        | 19,716.5        | 20,726.3        | 4.2%               |
| Exploration & Production                        | 1,044.0         | 1,687.0         | 1,795.0         | 2,042.8         | 2,339.5         | 2,596.9         | 2,971.2         | 3,268.3         | 3,648.8         | 12.6%              |
| Refining & Marketing                            | 11,722.0        | 12,780.0        | 11,768.9        | 12,411.4        | 13,279.4        | 13,295.8        | 13,260.1        | 13,340.0        | 13,974.9        | 2.9%               |
| Gas & Power                                     | 2,593.0         | 2,885.0         | 2,816.0         | 2,900.1         | 2,910.6         | 3,250.8         | 3,296.1         | 3,299.8         | 3,298.0         | 2.7%               |
| Other   | 134.0           | 142.0           | 144.4           | 146.9           | 149.4           | 151.9           | 154.5           | 157.1           | 159.8           | 1.7%               |
| Eliminations                                    | -292.0          | -312.0          | -317.8          | -323.8          | -329.8          | -336.0          | -342.3          | -348.7          | -355.2          | 1.9%               |
| Other operating income                          | 105.0           | 141.0           | 143.4           | 145.8           | 148.3           | 150.8           | 153.4           | 156.0           | 158.7           | 1.7%               |
| <b>Total operating income</b>                   | <b>15,307.0</b> | <b>17,322.0</b> | <b>16,349.9</b> | <b>17,323.2</b> | <b>18,497.3</b> | <b>19,110.3</b> | <b>19,493.1</b> | <b>19,872.6</b> | <b>20,885.0</b> | <b>4.2%</b>        |
| <b>Operating costs</b>                          |                 |                 |                 |                 |                 |                 |                 |                 |                 |                    |
| Cost of sales & Production costs                | 13,524.0        | 15,077.0        | 13,808.7        | 14,764.4        | 15,489.7        | 15,764.2        | 15,922.9        | 16,066.2        | 16,638.4        | 3.2%               |
| Exploration & Production                        | 194.0           | 247.0           | 340.1           | 381.0           | 423.1           | 469.8           | 521.7           | 574.0           | 631.7           | 10.9%              |
| Refining & Marketing                            | 10,951.0        | 12,143.0        | 11,044.4        | 11,829.0        | 12,523.2        | 12,435.0        | 12,504.4        | 12,596.5        | 13,129.4        | 2.9%               |
| Gas & Power                                     | 2,461.0         | 2,748.0         | 2,677.7         | 2,760.1         | 2,768.8         | 3,093.2         | 3,136.0         | 3,139.6         | 3,137.8         | 2.7%               |
| Other   | 104.0           | 116.0           | 116.6           | 117.7           | 120.1           | 123.2           | 125.0           | 127.2           | 129.7           | 1.8%               |
| Eliminations                                    | 292.0           | 317.0           | 305.2           | 323.4           | 345.5           | 357.0           | 364.2           | 371.3           | 390.3           | 4.2%               |
| RCA Effect                                      | 116.0           | -65.0           | -65.0           | -65.0           | -65.0           | -65.0           | -65.0           | -65.0           | -65.0           | 0.0%               |
| <b>EBITDA IFRS</b>                              | <b>1,899.0</b>  | <b>2,180.0</b>  | <b>2,541.3</b>  | <b>2,558.8</b>  | <b>3,007.6</b>  | <b>3,346.1</b>  | <b>3,570.2</b>  | <b>3,806.4</b>  | <b>4,246.6</b>  | <b>8.9%</b>        |
| Exploration & Production                        | 850.0           | 1,440.0         | 1,454.9         | 1,661.8         | 1,916.4         | 2,127.1         | 2,449.6         | 2,694.3         | 3,017.2         | 12.9%              |
| Refining & Marketing                            | 771.0           | 637.0           | 724.5           | 582.4           | 756.2           | 860.8           | 755.8           | 743.4           | 845.5           | 2.6%               |
| Gas & Power                                     | 132.0           | 137.0           | 138.3           | 140.0           | 141.7           | 157.6           | 160.1           | 160.1           | 160.1           | 2.5%               |
| Other   | 30.0            | 26.0            | 27.8            | 29.2            | 29.3            | 28.7            | 29.5            | 29.9            | 30.1            | 1.3%               |
| Eliminations                                    | 0.0             | 5.0             | -12.7           | -0.3            | 15.7            | 21.0            | 21.9            | 22.6            | 35.1            | -                  |
| <b>D&amp;A, Provisions &amp; Impairments</b>    | <b>784.0</b>    | <b>682.0</b>    | <b>774.1</b>    | <b>840.9</b>    | <b>894.4</b>    | <b>938.8</b>    | <b>988.8</b>    | <b>1,032.0</b>  | <b>1,093.7</b>  | <b>5.9%</b>        |
| Exploration & Production                        | 383             | 329             | 465.702         | 500.1           | 535.9           | 576.4           | 621.9           | 668.3           | 719.3           | 7.5%               |
| Refining & Marketing                            | 357             | 337             | 235.453         | 258.3           | 269.4           | 268.6           | 256.0           | 255.7           | 267.4           | 2.1%               |
| Gas & Power                                     | 18              | 21              | 43.9934         | 45.1            | 58.6            | 61.6            | 77.6            | 76.0            | 74.5            | 9.2%               |
| Other   | 4.0             | 4.0             | 0.0             | 0.0             | 0.0             | 0.0             | 0.0             | 0.0             | 0.0             | 0.0%               |
| Eliminations                                    | 0.0             | 0.0             | 0.0             | 0.0             | 0.0             | 0.0             | 0.0             | 0.0             | 0.0             | 0.0%               |
| Provisions (including CESE)                     | 22              | -9              | 29              | 37.3            | 30.4            | 32.3            | 33.3            | 32.0            | 32.5            | 1.9%               |
| <b>Total operating costs</b>                    | <b>14,308.0</b> | <b>15,759.0</b> | <b>14,582.8</b> | <b>15,605.3</b> | <b>16,384.1</b> | <b>16,702.9</b> | <b>16,911.7</b> | <b>17,098.2</b> | <b>17,732.1</b> | <b>3.3%</b>        |
| <b>EBIT IFRS</b>                                | <b>1,115.0</b>  | <b>1,498.0</b>  | <b>1,767.1</b>  | <b>1,717.9</b>  | <b>2,113.2</b>  | <b>2,407.3</b>  | <b>2,581.4</b>  | <b>2,774.4</b>  | <b>3,152.9</b>  | <b>10.1%</b>       |
| Exploration & Production                        | 467.0           | 1,111.0         | 989.2           | 1,161.7         | 1,380.5         | 1,550.7         | 1,827.7         | 2,026.0         | 2,297.8         | 15.1%              |
| Refining & Marketing                            | 414.0           | 300.0           | 489.0           | 324.0           | 486.8           | 592.2           | 499.8           | 487.7           | 578.1           | 2.8%               |
| Gas & Power                                     | 114.0           | 116.0           | 94.3            | 94.9            | 83.1            | 96.0            | 82.6            | 84.1            | 85.7            | -1.6%              |
| Other   | 26.0            | 22.0            | 27.8            | 29.2            | 29.3            | 28.7            | 29.5            | 29.9            | 30.1            | 1.3%               |
| Eliminations                                    | 0.0             | 5.0             | -12.7           | -0.3            | 15.7            | 21.0            | 21.9            | 22.6            | 35.1            | -                  |
| Net financial expenses                          | -14.0           | -12.0           | -82.1           | -95.9           | -101.6          | -106.1          | -111.5          | -116.9          | -122.2          | 6.8%               |
| Exchange gains/losses & derivatives             | -18.0           | -59.0           | 0.0             | 0.0             | 0.0             | 0.0             | 0.0             | 0.0             | 0.0             | 0.0%               |
| Operating leases interest (IFRS 16)             | 0.0             | 0.0             | -92.2           | -86.0           | -80.6           | -76.4           | -73.2           | -70.9           | -68.9           | -4.7%              |
| Results from financial investments              | 163.0           | 129.0           | 129.0           | 129.0           | 129.0           | 129.0           | 129.0           | 129.0           | 129.0           | 0.0%               |
| <b>Financial result</b>                         | <b>131.0</b>    | <b>58.0</b>     | <b>-45.3</b>    | <b>-52.9</b>    | <b>-53.2</b>    | <b>-53.5</b>    | <b>-55.7</b>    | <b>-58.8</b>    | <b>-62.0</b>    | <b>5.4%</b>        |
| <b>Profit before taxes</b>                      | <b>1,246.0</b>  | <b>1,556.0</b>  | <b>1,721.8</b>  | <b>1,665.1</b>  | <b>2,060.1</b>  | <b>2,353.8</b>  | <b>2,525.7</b>  | <b>2,715.5</b>  | <b>3,090.9</b>  | <b>10.2%</b>       |
| Income taxes                                    | -496.0          | -736.0          | -542.4          | -524.5          | -648.9          | -741.5          | -795.6          | -855.4          | -973.6          | 10.2%              |
| SPT&IRP   | 0.0             | 0.0             | -296.8          | -348.5          | -414.1          | -465.2          | -548.3          | -607.8          | -689.4          | 15.1%              |
| Energy sector extraordinary contribution (CESE) | -64.0           | -60.0           | -64.8           | -64.2           | -63.2           | -63.0           | -63.8           | -63.6           | -63.4           | -0.3%              |
| <b>Net Income</b>                               | <b>686.0</b>    | <b>760.0</b>    | <b>817.9</b>    | <b>727.9</b>    | <b>933.8</b>    | <b>1,084.1</b>  | <b>1,118.0</b>  | <b>1,188.8</b>  | <b>1,364.5</b>  | <b>8.9%</b>        |
| Non-controlling interests                       | -88.0           | -151.0          | -158.8          | -163.8          | -195.7          | -226.2          | -240.8          | -259.7          | -294.6          | 10.9%              |
| <b>Net income to common shareholders</b>        | <b>598.0</b>    | <b>609.0</b>    | <b>659.1</b>    | <b>564.1</b>    | <b>738.1</b>    | <b>857.9</b>    | <b>877.2</b>    | <b>929.0</b>    | <b>1,069.8</b>  | <b>8.4%</b>        |
| <b>Shares outstanding (million)</b>             | <b>829.3</b>    | <b>0.0%</b>        |
| <b>Basic and diluted EPS</b>                    | <b>0.72</b>     | <b>0.73</b>     | <b>0.79</b>     | <b>0.68</b>     | <b>0.89</b>     | <b>1.03</b>     | <b>1.06</b>     | <b>1.12</b>     | <b>1.29</b>     | <b>8.4%</b>        |
| <b>DPS</b>                                      | <b>0.00</b>     | <b>0.63</b>     | <b>0.70</b>     | <b>0.77</b>     | <b>0.84</b>     | <b>0.88</b>     | <b>0.93</b>     | <b>0.97</b>     | <b>1.02</b>     | <b>6.6%</b>        |
| <b>Dividend (€m)</b>                            | <b>0.0</b>      | <b>524.5</b>    | <b>577.0</b>    | <b>634.6</b>    | <b>698.1</b>    | <b>733.0</b>    | <b>769.7</b>    | <b>808.2</b>    | <b>848.6</b>    | <b>6.6%</b>        |
| <b>Payout</b>                                   | <b>0.00</b>     | <b>0.69</b>     | <b>0.71</b>     | <b>0.87</b>     | <b>0.75</b>     | <b>0.68</b>     | <b>0.69</b>     | <b>0.68</b>     | <b>0.62</b>     | <b>-2.1%</b>       |

**Appendix 2: Common-size Income Statement (GALP)**

| Income Statement - Common-size                  | 2017           | 2018           | 2019E          | 2020F          | 2021F          | 2022F          | 2023F          | 2024F          | 2025F          |
|---|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| <b>Operating Income</b>                         |                |                |                |                |                |                |                |                |                |
| Sales and service rendered                      | 99.31%         | 99.19%         | 99.12%         | 99.16%         | 99.20%         | 99.21%         | 99.21%         | 99.21%         | 99.24%         |
| Exploration & Production                        | 6.82%          | 9.74%          | 10.98%         | 11.79%         | 12.65%         | 13.59%         | 15.24%         | 16.45%         | 17.47%         |
| Refining & Marketing                            | 76.58%         | 73.78%         | 71.98%         | 71.65%         | 71.79%         | 69.57%         | 68.02%         | 67.13%         | 66.91%         |
| Gas & Power                                     | 16.94%         | 16.66%         | 17.22%         | 16.74%         | 15.73%         | 17.01%         | 16.91%         | 16.60%         | 15.79%         |
| Other   | 0.88%          | 0.82%          | 0.88%          | 0.85%          | 0.81%          | 0.79%          | 0.79%          | 0.79%          | 0.77%          |
| Eliminations                                    | -1.91%         | -1.80%         | -1.94%         | -1.87%         | -1.78%         | -1.76%         | -1.76%         | -1.75%         | -1.70%         |
| Other operating income                          | 0.69%          | 0.81%          | 0.88%          | 0.84%          | 0.80%          | 0.79%          | 0.79%          | 0.79%          | 0.76%          |
| <b>Total operating income</b>                   | <b>100.00%</b> |
| <b>Operating costs</b>                          |                |                |                |                |                |                |                |                |                |
| Cost of sales & Production costs                | 88.35%         | 87.04%         | 84.46%         | 85.23%         | 83.74%         | 82.49%         | 81.68%         | 80.85%         | 79.67%         |
| Exploration & Production                        | 1.27%          | 1.43%          | 2.08%          | 2.20%          | 2.29%          | 2.46%          | 2.68%          | 2.89%          | 3.02%          |
| Refining & Marketing                            | 71.54%         | 70.10%         | 67.55%         | 68.28%         | 67.70%         | 65.07%         | 64.15%         | 63.39%         | 62.87%         |
| Gas & Power                                     | 16.08%         | 15.86%         | 16.38%         | 15.93%         | 14.97%         | 16.19%         | 16.09%         | 15.80%         | 15.02%         |
| Other   | 0.68%          | 0.67%          | 0.71%          | 0.68%          | 0.65%          | 0.64%          | 0.64%          | 0.64%          | 0.62%          |
| Eliminations                                    | 1.91%          | 1.83%          | 1.87%          | 1.87%          | 1.87%          | 1.87%          | 1.87%          | 1.87%          | 1.87%          |
| RCA Effect                                      | 0.76%          | -0.38%         | -0.40%         | -0.38%         | -0.35%         | -0.34%         | -0.33%         | -0.33%         | -0.31%         |
| <b>EBITDA IFRS</b>                              | <b>12.41%</b>  | <b>12.59%</b>  | <b>15.54%</b>  | <b>14.77%</b>  | <b>16.26%</b>  | <b>17.51%</b>  | <b>18.32%</b>  | <b>19.15%</b>  | <b>20.33%</b>  |
| Exploration & Production                        | 5.55%          | 8.31%          | 8.90%          | 9.59%          | 10.36%         | 11.13%         | 12.57%         | 13.56%         | 14.45%         |
| Refining & Marketing                            | 5.04%          | 3.68%          | 4.43%          | 3.36%          | 4.09%          | 4.50%          | 3.88%          | 3.74%          | 4.05%          |
| Gas & Power                                     | 0.86%          | 0.79%          | 0.85%          | 0.81%          | 0.77%          | 0.82%          | 0.82%          | 0.81%          | 0.77%          |
| Other   | 0.20%          | 0.15%          | 0.17%          | 0.17%          | 0.16%          | 0.15%          | 0.15%          | 0.15%          | 0.14%          |
| Eliminations                                    | 0.00%          | 0.03%          | -0.08%         | 0.00%          | 0.08%          | 0.11%          | 0.11%          | 0.11%          | 0.17%          |
| <b>D&amp;A, Provisions &amp; Impairments</b>    | <b>5.12%</b>   | <b>3.94%</b>   | <b>4.73%</b>   | <b>4.85%</b>   | <b>4.84%</b>   | <b>4.91%</b>   | <b>5.07%</b>   | <b>5.19%</b>   | <b>5.24%</b>   |
| Exploration & Production                        | 2.50%          | 1.90%          | 2.85%          | 2.89%          | 2.90%          | 3.02%          | 3.19%          | 3.36%          | 3.44%          |
| Refining & Marketing                            | 2.33%          | 1.95%          | 1.44%          | 1.49%          | 1.46%          | 1.41%          | 1.31%          | 1.29%          | 1.28%          |
| Gas & Power                                     | 0.12%          | 0.12%          | 0.27%          | 0.26%          | 0.32%          | 0.32%          | 0.40%          | 0.38%          | 0.36%          |
| Other   | 0.03%          | 0.02%          | 0.00%          | 0.00%          | 0.00%          | 0.00%          | 0.00%          | 0.00%          | 0.00%          |
| Eliminations                                    | 0.00%          | 0.00%          | 0.00%          | 0.00%          | 0.00%          | 0.00%          | 0.00%          | 0.00%          | 0.00%          |
| Provisions (including CESE)                     | 0.14%          | -0.05%         | 0.18%          | 0.22%          | 0.16%          | 0.17%          | 0.17%          | 0.16%          | 0.16%          |
| <b>Total operating costs</b>                    | <b>93.47%</b>  | <b>90.98%</b>  | <b>89.19%</b>  | <b>90.08%</b>  | <b>88.58%</b>  | <b>87.40%</b>  | <b>86.76%</b>  | <b>86.04%</b>  | <b>84.90%</b>  |
| <b>EBIT IFRS</b>                                | <b>7.28%</b>   | <b>8.65%</b>   | <b>10.81%</b>  | <b>9.92%</b>   | <b>11.42%</b>  | <b>12.60%</b>  | <b>13.24%</b>  | <b>13.96%</b>  | <b>15.10%</b>  |
| Exploration & Production                        | 3.05%          | 6.41%          | 6.05%          | 6.71%          | 7.46%          | 8.11%          | 9.38%          | 10.19%         | 11.00%         |
| Refining & Marketing                            | 2.70%          | 1.73%          | 2.99%          | 1.87%          | 2.63%          | 3.10%          | 2.56%          | 2.45%          | 2.77%          |
| Gas & Power                                     | 0.74%          | 0.67%          | 0.58%          | 0.55%          | 0.45%          | 0.50%          | 0.42%          | 0.42%          | 0.41%          |
| Other   | 0.17%          | 0.13%          | 0.17%          | 0.17%          | 0.16%          | 0.15%          | 0.15%          | 0.15%          | 0.14%          |
| Eliminations                                    | 0.00%          | 0.03%          | -0.08%         | 0.00%          | 0.08%          | 0.11%          | 0.11%          | 0.11%          | 0.17%          |
| Net financial expenses                          | -0.09%         | -0.07%         | -0.50%         | -0.55%         | -0.55%         | -0.56%         | -0.57%         | -0.59%         | -0.58%         |
| Exchange gains/losses & derivatives             | -0.12%         | -0.34%         | 0.00%          | 0.00%          | 0.00%          | 0.00%          | 0.00%          | 0.00%          | 0.00%          |
| Operating leases interest (IFRS 16)             | 0.00%          | 0.00%          | -0.56%         | -0.50%         | -0.44%         | -0.40%         | -0.38%         | -0.36%         | -0.33%         |
| Results from financial investments              | 1.06%          | 0.74%          | 0.79%          | 0.74%          | 0.70%          | 0.68%          | 0.66%          | 0.65%          | 0.62%          |
| <b>Financial result</b>                         | <b>0.86%</b>   | <b>0.33%</b>   | <b>-0.28%</b>  | <b>-0.31%</b>  | <b>-0.29%</b>  | <b>-0.28%</b>  | <b>-0.29%</b>  | <b>-0.30%</b>  | <b>-0.30%</b>  |
| <b>Profit before taxes</b>                      | <b>8.14%</b>   | <b>8.98%</b>   | <b>10.53%</b>  | <b>9.61%</b>   | <b>11.14%</b>  | <b>12.32%</b>  | <b>12.96%</b>  | <b>13.66%</b>  | <b>14.80%</b>  |
| Income taxes                                    | -3.24%         | -4.25%         | -3.32%         | -3.03%         | -3.51%         | -3.88%         | -4.08%         | -4.30%         | -4.66%         |
| SPT&IRP   | 0.00%          | 0.00%          | -1.82%         | -2.01%         | -2.24%         | -2.43%         | -2.81%         | -3.06%         | -3.30%         |
| Energy sector extraordinary contribution (CESE) | -0.42%         | -0.35%         | -0.40%         | -0.37%         | -0.34%         | -0.33%         | -0.33%         | -0.32%         | -0.30%         |
| <b>Net Income</b>                               | <b>4.48%</b>   | <b>4.39%</b>   | <b>5.00%</b>   | <b>4.20%</b>   | <b>5.05%</b>   | <b>5.67%</b>   | <b>5.74%</b>   | <b>5.98%</b>   | <b>6.53%</b>   |
| Non-controlling interests                       | -0.57%         | -0.87%         | -0.97%         | -0.95%         | -1.06%         | -1.18%         | -1.24%         | -1.31%         | -1.41%         |
| <b>Net income to common shareholders</b>        | <b>3.91%</b>   | <b>3.52%</b>   | <b>4.03%</b>   | <b>3.26%</b>   | <b>3.99%</b>   | <b>4.49%</b>   | <b>4.50%</b>   | <b>4.67%</b>   | <b>5.12%</b>   |

**Appendix 3: Statement of Financial Position (GALP)**

| Balance Sheet (m€)                           | 2017            | 2018            | 2019E           | 2020F           | 2021F           | 2022F           | 2023F           | 2024F           | 2025F           | CAGR<br>19-25F |
|--|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------|
| <b>Non-current assets</b>                    | 7,806.0         | 7,960.0         | 9,571.4         | 9,940.2         | 10,292.7        | 10,647.9        | 11,006.9        | 11,297.7        | 11,513.5        | 3.1%           |
| Tangibles assets                             | 5,193.0         | 5,333.0         | 5,508.9         | 5,693.9         | 5,853.6         | 6,016.7         | 6,180.4         | 6,288.2         | 6,324.5         | 2.3%           |
| Rights of Use (IFRS 16)                      | 0.0             | 1,282.0         | 1,245.8         | 1,215.5         | 1,192.0         | 1,175.8         | 1,166.4         | 1,155.7         | 1,144.0         | -1.4%          |
| Goodwill                                     | 84.0            | 85.0            | 85.0            | 85.0            | 85.0            | 85.0            | 85.0            | 85.0            | 85.0            | 0.0%           |
| Intangible assets                            | 407.0           | 547.0           | 666.0           | 736.7           | 806.6           | 876.9           | 947.1           | 1,006.1         | 1,053.5         | 7.9%           |
| Investments in associates and joint ventures | 1,483.0         | 1,295.0         | 1,424.0         | 1,553.0         | 1,682.0         | 1,811.0         | 1,940.0         | 2,069.0         | 2,198.0         | 7.5%           |
| Deferred tax assets                          | 350.0           | 369.0           | 369.0           | 369.0           | 369.0           | 369.0           | 369.0           | 369.0           | 369.0           | 0.0%           |
| Other receivables                            | 254.0           | 298.0           | 239.7           | 254.1           | 271.4           | 280.4           | 286.1           | 291.6           | 306.6           | 4.2%           |
| Other financial assets                       | 35.0            | 33.0            | 33.0            | 33.0            | 33.0            | 33.0            | 33.0            | 33.0            | 33.0            | 0.0%           |
| <b>Current assets</b>                        | 4,245.0         | 4,726.0         | 4,998.9         | 5,025.7         | 5,196.4         | 5,466.7         | 5,715.8         | 6,061.5         | 6,675.5         | 4.9%           |
| Inventory                                    | 970.0           | 1,171.0         | 1,029.8         | 1,122.0         | 1,199.9         | 1,245.3         | 1,283.2         | 1,321.4         | 1,397.1         | 5.2%           |
| Other financial investments                  | 66.0            | 200.0           | 200.0           | 200.0           | 200.0           | 200.0           | 200.0           | 200.0           | 200.0           | 0.0%           |
| Trade receivables                            | 1,018.0         | 1,032.0         | 1,296.5         | 1,417.1         | 1,559.7         | 1,658.9         | 1,740.6         | 1,823.8         | 1,969.0         | 7.2%           |
| Other receivables                            | 535.0           | 640.0           | 595.8           | 631.5           | 674.5           | 697.0           | 710.9           | 724.8           | 761.9           | 4.2%           |
| Other receivables - Sinopec                  | 459.0           | 176.0           | 0.0             | 0.0             | 0.0             | 0.0             | 0.0             | 0.0             | 0.0             | 0.0%           |
| Cash and cash equivalents                    | 1,197.0         | 1,508.0         | 1,876.8         | 1,655.1         | 1,562.3         | 1,665.5         | 1,781.0         | 1,991.5         | 2,347.4         | 3.8%           |
| <b>Assets</b>                                | <b>12,051.0</b> | <b>12,687.0</b> | <b>14,570.3</b> | <b>14,965.9</b> | <b>15,489.1</b> | <b>16,114.6</b> | <b>16,722.6</b> | <b>17,359.2</b> | <b>18,189.0</b> | <b>3.8%</b>    |
| <b>Equity</b>                                | <b>5,779.0</b>  | <b>6,047.0</b>  | <b>6,287.0</b>  | <b>6,380.2</b>  | <b>6,615.9</b>  | <b>6,967.0</b>  | <b>7,315.3</b>  | <b>7,696.0</b>  | <b>8,211.9</b>  | <b>4.6%</b>    |
| Share capital and share premium              | 911.0           | 911.0           | 911.0           | 911.0           | 911.0           | 911.0           | 911.0           | 911.0           | 911.0           | 0.0%           |
| Reserves & Retained earnings                 | 3,433.0         | 3,675.0         | 3,757.2         | 3,686.6         | 3,726.6         | 3,851.5         | 3,959.1         | 4,080.0         | 4,301.2         | 2.3%           |
| Total equity attributable to shareholders    | 4,344.0         | 4,586.0         | 4,668.2         | 4,597.6         | 4,637.6         | 4,762.5         | 4,870.1         | 4,991.0         | 5,212.2         | 1.9%           |
| Non-controlling interests                    | 1,435.0         | 1,460.0         | 1,618.8         | 1,782.6         | 1,978.2         | 2,204.5         | 2,445.2         | 2,705.0         | 2,999.6         | 10.8%          |
| <b>Liabilities</b>                           | <b>6,272.0</b>  | <b>6,640.0</b>  | <b>8,283.3</b>  | <b>8,585.7</b>  | <b>8,873.3</b>  | <b>9,147.6</b>  | <b>9,407.3</b>  | <b>9,663.2</b>  | <b>9,977.1</b>  | <b>3.1%</b>    |
| <b>Non-current liabilities</b>               | <b>3,842.0</b>  | <b>4,006.0</b>  | <b>5,529.4</b>  | <b>5,658.7</b>  | <b>5,741.0</b>  | <b>5,863.4</b>  | <b>5,986.2</b>  | <b>6,093.4</b>  | <b>6,174.3</b>  | <b>1.9%</b>    |
| Debt   | 2,532.0         | 2,686.0         | 3,167.2         | 3,321.7         | 3,422.7         | 3,549.5         | 3,664.7         | 3,763.8         | 3,834.5         | 3.2%           |
| Operating Leases (IFRS 16)                   | 0.0             | 1,089.0         | 1,012.2         | 949.6           | 900.5           | 863.9           | 838.1           | 814.2           | 791.8           | -4.0%          |
| Other payables                               | 286.0           | 126.0           | 126.0           | 126.0           | 126.0           | 126.0           | 126.0           | 126.0           | 126.0           | 0.0%           |
| Post-employment liabilities                  | 326.0           | 304.0           | 304.0           | 304.0           | 304.0           | 304.0           | 304.0           | 304.0           | 304.0           | 0.0%           |
| Deferred tax liabilities                     | 76.0            | 196.0           | 196.0           | 196.0           | 196.0           | 196.0           | 196.0           | 196.0           | 196.0           | 0.0%           |
| Other financial instruments                  | 3.0             | 37.0            | 37.0            | 37.0            | 37.0            | 37.0            | 37.0            | 37.0            | 37.0            | 0.0%           |
| Provisions (including CESE)                  | 619.0           | 658.0           | 687.0           | 724.3           | 754.8           | 787.0           | 820.4           | 852.4           | 884.9           | 4.3%           |
| CESE   | 272.0           | 297.0           | 326.0           | 363.3           | 393.8           | 426.0           | 459.4           | 491.4           | 523.9           | 8.2%           |
| Others                                       | 347.0           | 361.0           | 361.0           | 361.0           | 361.0           | 361.0           | 361.0           | 361.0           | 361.0           | 0.0%           |
| <b>Current liabilities</b>                   | <b>2,430.0</b>  | <b>2,634.0</b>  | <b>2,753.9</b>  | <b>2,927.0</b>  | <b>3,132.3</b>  | <b>3,284.2</b>  | <b>3,421.1</b>  | <b>3,569.8</b>  | <b>3,802.9</b>  | <b>5.5%</b>    |
| Debt   | 551.0           | 559.0           | 622.4           | 693.0           | 771.7           | 859.2           | 956.7           | 1,065.2         | 1,186.1         | 11.3%          |
| Operating Leases (IFRS 16)                   | 0.0             | 113.0           | 108.9           | 101.2           | 95.0            | 90.0            | 86.4            | 83.8            | 81.4            | -4.7%          |
| Trade payables & Other payables              | 1,743.0         | 1,891.0         | 1,838.6         | 1,948.8         | 2,081.7         | 2,150.9         | 2,194.1         | 2,236.8         | 2,351.4         | 4.2%           |
| Other financial instruments                  | 21.0            | 102.0           | 102.0           | 102.0           | 102.0           | 102.0           | 102.0           | 102.0           | 102.0           | 0.0%           |
| Current income tax payable                   | 115.0           | 82.0            | 82.0            | 82.0            | 82.0            | 82.0            | 82.0            | 82.0            | 82.0            | 0.0%           |
| <b>Equity and Liabilities</b>                | <b>12,051.0</b> | <b>12,687.0</b> | <b>14,570.3</b> | <b>14,965.9</b> | <b>15,489.1</b> | <b>16,114.6</b> | <b>16,722.6</b> | <b>17,359.2</b> | <b>18,189.0</b> | <b>3.8%</b>    |

| Balance sheet - Common-Size                  | 2017          | 2018          | 2019E         | 2020F         | 2021F         | 2022F         | 2023F         | 2024F         | 2025F         |
|--|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Non-current assets                           | 64.8%         | 62.7%         | 65.7%         | 66.4%         | 66.5%         | 66.1%         | 65.8%         | 65.1%         | 63.3%         |
| Tangibles assets                             | 43.1%         | 42.0%         | 37.8%         | 38.0%         | 37.8%         | 37.3%         | 37.0%         | 36.2%         | 34.8%         |
| Rights of Use (IFRS 16)                      | 0.0%          | 10.1%         | 8.6%          | 8.1%          | 7.7%          | 7.3%          | 7.0%          | 6.7%          | 6.3%          |
| Goodwill                                     | 0.7%          | 0.7%          | 0.6%          | 0.6%          | 0.5%          | 0.5%          | 0.5%          | 0.5%          | 0.5%          |
| Intangible assets                            | 3.4%          | 4.3%          | 4.6%          | 4.9%          | 5.2%          | 5.4%          | 5.7%          | 5.8%          | 5.8%          |
| Investments in associates and joint ventures | 12.3%         | 10.2%         | 9.8%          | 10.4%         | 10.9%         | 11.2%         | 11.6%         | 11.9%         | 12.1%         |
| Deferred tax assets                          | 2.9%          | 2.9%          | 2.5%          | 2.5%          | 2.4%          | 2.3%          | 2.2%          | 2.1%          | 2.0%          |
| Other receivables                            | 2.1%          | 2.3%          | 1.6%          | 1.7%          | 1.8%          | 1.7%          | 1.7%          | 1.7%          | 1.7%          |
| Other financial assets                       | 0.3%          | 0.3%          | 0.2%          | 0.2%          | 0.2%          | 0.2%          | 0.2%          | 0.2%          | 0.2%          |
| Current assets                               | 35.2%         | 37.3%         | 34.3%         | 33.6%         | 33.5%         | 33.9%         | 34.2%         | 34.9%         | 36.7%         |
| Inventory                                    | 8.0%          | 9.2%          | 7.1%          | 7.5%          | 7.7%          | 7.7%          | 7.7%          | 7.6%          | 7.7%          |
| Other financial investments                  | 0.5%          | 1.6%          | 1.4%          | 1.3%          | 1.3%          | 1.2%          | 1.2%          | 1.2%          | 1.1%          |
| Trade receivables                            | 8.4%          | 8.1%          | 8.9%          | 9.5%          | 10.1%         | 10.3%         | 10.4%         | 10.5%         | 10.8%         |
| Other receivables                            | 4.4%          | 5.0%          | 4.1%          | 4.2%          | 4.4%          | 4.3%          | 4.3%          | 4.2%          | 4.2%          |
| Other receivables - Sinopec                  | 3.8%          | 1.4%          | 0.0%          | 0.0%          | 0.0%          | 0.0%          | 0.0%          | 0.0%          | 0.0%          |
| Cash and cash equivalents                    | 9.9%          | 11.9%         | 12.9%         | 11.1%         | 10.1%         | 10.3%         | 10.7%         | 11.5%         | 12.9%         |
| <b>Assets</b>                                | <b>100.0%</b> |
| <b>Equity</b>                                | <b>48.0%</b>  | <b>47.7%</b>  | <b>43.1%</b>  | <b>42.6%</b>  | <b>42.7%</b>  | <b>43.2%</b>  | <b>43.7%</b>  | <b>44.3%</b>  | <b>45.1%</b>  |
| Share capital and share premium              | 7.6%          | 7.2%          | 6.3%          | 6.1%          | 5.9%          | 5.7%          | 5.4%          | 5.2%          | 5.0%          |
| Reserves & Retained earnings                 | 28.5%         | 29.0%         | 25.8%         | 24.6%         | 24.1%         | 23.9%         | 23.7%         | 23.5%         | 23.6%         |
| Total equity attributable to shareholders    | 36.0%         | 36.1%         | 32.0%         | 30.7%         | 29.9%         | 29.6%         | 29.1%         | 28.8%         | 28.7%         |
| Non-controlling interests                    | 11.9%         | 11.5%         | 11.1%         | 11.9%         | 12.8%         | 13.7%         | 14.6%         | 15.6%         | 16.5%         |
| <b>Liabilities</b>                           | <b>52.0%</b>  | <b>52.3%</b>  | <b>56.9%</b>  | <b>57.4%</b>  | <b>57.3%</b>  | <b>56.8%</b>  | <b>56.3%</b>  | <b>55.7%</b>  | <b>54.9%</b>  |
| Non-current liabilities                      | 31.9%         | 31.6%         | 37.9%         | 37.8%         | 37.1%         | 36.4%         | 35.8%         | 35.1%         | 33.9%         |
| Debt   | 21.0%         | 21.2%         | 21.7%         | 22.2%         | 22.1%         | 22.0%         | 21.9%         | 21.7%         | 21.1%         |
| Operating Leases (IFRS 16)                   | 0.0%          | 8.6%          | 6.9%          | 6.3%          | 5.8%          | 5.4%          | 5.0%          | 4.7%          | 4.4%          |
| Other payables                               | 2.4%          | 1.0%          | 0.9%          | 0.8%          | 0.8%          | 0.8%          | 0.8%          | 0.7%          | 0.7%          |
| Post-employment liabilities                  | 2.7%          | 2.4%          | 2.1%          | 2.0%          | 2.0%          | 1.9%          | 1.8%          | 1.8%          | 1.7%          |
| Deferred tax liabilities                     | 0.6%          | 1.5%          | 1.3%          | 1.3%          | 1.3%          | 1.2%          | 1.2%          | 1.1%          | 1.1%          |
| Other financial instruments                  | 0.0%          | 0.3%          | 0.3%          | 0.2%          | 0.2%          | 0.2%          | 0.2%          | 0.2%          | 0.2%          |
| Provisions (including CESE)                  | 5.1%          | 5.2%          | 4.7%          | 4.8%          | 4.9%          | 4.9%          | 4.9%          | 4.9%          | 4.9%          |
| CESE   | 2.3%          | 2.3%          | 2.2%          | 2.4%          | 2.5%          | 2.6%          | 2.7%          | 2.8%          | 2.9%          |
| Others                                       | 2.9%          | 2.8%          | 2.5%          | 2.4%          | 2.3%          | 2.2%          | 2.2%          | 2.1%          | 2.0%          |
| Current liabilities                          | 20.2%         | 20.8%         | 18.9%         | 19.6%         | 20.2%         | 20.4%         | 20.5%         | 20.6%         | 20.9%         |
| Debt   | 4.6%          | 4.4%          | 4.3%          | 4.6%          | 5.0%          | 5.3%          | 5.7%          | 6.1%          | 6.5%          |
| Operating Leases (IFRS 16)                   | 0.0%          | 0.9%          | 0.7%          | 0.7%          | 0.6%          | 0.6%          | 0.5%          | 0.5%          | 0.4%          |
| Trade payables & Other payables              | 14.5%         | 14.9%         | 12.6%         | 13.0%         | 13.4%         | 13.3%         | 13.1%         | 12.9%         | 12.9%         |
| Other financial instruments                  | 0.2%          | 0.8%          | 0.7%          | 0.7%          | 0.7%          | 0.6%          | 0.6%          | 0.6%          | 0.6%          |
| Current income tax payable                   | 1.0%          | 0.6%          | 0.6%          | 0.5%          | 0.5%          | 0.5%          | 0.5%          | 0.5%          | 0.5%          |
| <b>Equity and Liabilities</b>                | <b>100.0%</b> |

#### Appendix 4: Cash-Flow Statement and Common-size (GALP)

| Cash Flow Statement (mEUR)                              | 2019E        | 2020F        | 2021F        | 2022F        | 2023F        | 2024F        | 2025F        | CAGR 19-25F |
|---|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-------------|
| OPERATING ACTIVITIES                                    | 1,392.1      | 1,468.9      | 1,733.4      | 1,969.5      | 2,066.6      | 2,181.6      | 2,361.7      | 9.2%        |
| EBIT IFRS   | 1,767.1      | 1,717.9      | 2,113.2      | 2,407.3      | 2,581.4      | 2,774.4      | 3,152.9      | 10.1%       |
| Non-Cash Charges  | 774.1        | 840.9        | 894.4        | 938.8        | 988.8        | 1,032.0      | 1,093.7      | 5.9%        |
| Corporate Income Taxes and oil and gas production taxes | -903.9       | -937.2       | -1,126.3     | -1,269.7     | -1,407.7     | -1,526.8     | -1,726.4     | 11.4%       |
| -DNWC   | -245.2       | -152.7       | -147.9       | -106.9       | -96.0        | -98.1        | -158.5       | -7.0%       |
| INVESTMENT ACTIVITIES                                   | -643.9       | -934.7       | -972.1       | -1,020.7     | -1,071.7     | -1,050.3     | -1,029.3     | 8.1%        |
| CAPEX for tangible and intangible assets                | -911.9       | -1,029.0     | -1,070.1     | -1,123.6     | -1,179.8     | -1,156.2     | -1,133.1     | 3.7%        |
| CAPEX for Oper. Leases (IFRS 16)                        | 92.0         | 94.3         | 98.1         | 103.0        | 108.1        | 106.0        | 103.8        | 2.0%        |
| Other receivables - Sinopec                             | 176.0        | 0.0          | 0.0          | 0.0          | 0.0          | 0.0          | 0.0          | -           |
| FINANCING ACTIVITIES                                    | -379.5       | -756.0       | -854.1       | -845.6       | -879.3       | -920.8       | -976.6       | 17.1%       |
| Financial Result  | -82.1        | -95.9        | -101.6       | -106.1       | -111.5       | -116.9       | -122.2       | 6.8%        |
| Dividends paid  | -577.0       | -634.6       | -698.1       | -733.0       | -769.7       | -808.2       | -848.6       | 6.6%        |
| Debt issuances/repayments                               | 544.6        | 225.1        | 179.6        | 214.3        | 212.6        | 207.7        | 191.6        | -16.0%      |
| Interest relating to leasing                            | -92.2        | -86.0        | -80.6        | -76.4        | -73.2        | -70.9        | -68.9        | -4.7%       |
| Payments relating to leasings (IFRS 16)                 | -172.9       | -164.6       | -153.4       | -144.5       | -137.6       | -132.5       | -128.6       | -4.8%       |
| Change in cash & cash equivalents                       | 368.8        | -221.7       | -92.8        | 103.2        | 115.6        | 210.5        | 355.9        | -0.6%       |
| Beginning cash  | 1,508.0      | 1,876.8      | 1,655.1      | 1,562.3      | 1,665.5      | 1,781.0      | 1,991.5      | 4.7%        |
| Ending cash   | 1,876.8      | 1,655.1      | 1,562.3      | 1,665.5      | 1,781.0      | 1,991.5      | 2,347.4      | 3.8%        |
| <b>Cash Flow Statement - Common-size</b>                | <b>2019E</b> | <b>2020F</b> | <b>2021F</b> | <b>2022F</b> | <b>2023F</b> | <b>2024F</b> | <b>2025F</b> |             |
| OPERATING ACTIVITIES                                    | 100.0%       | 100.0%       | 100.0%       | 100.0%       | 100.0%       | 100.0%       | 100.0%       |             |
| EBIT IFRS   | 126.9%       | 117.0%       | 121.9%       | 122.2%       | 124.9%       | 127.2%       | 133.5%       |             |
| Non-Cash Charges  | 55.6%        | 57.2%        | 51.6%        | 47.7%        | 47.8%        | 47.3%        | 46.3%        |             |
| Corporate Income Taxes and oil and gas production taxes | -64.9%       | -63.8%       | -65.0%       | -64.5%       | -68.1%       | -70.0%       | -73.1%       |             |
| -DNWC   | -17.6%       | -10.4%       | -8.5%        | -5.4%        | -4.6%        | -4.5%        | -6.7%        |             |
| INVESTMENT ACTIVITIES                                   | -46.3%       | -63.6%       | -56.1%       | -51.8%       | -51.9%       | -48.1%       | -43.6%       |             |
| CAPEX for tangible and intangible assets                | -65.5%       | -70.0%       | -61.7%       | -57.1%       | -57.1%       | -53.0%       | -48.0%       |             |
| CAPEX for Oper. Leases (IFRS 16)                        | 6.6%         | 6.4%         | 5.7%         | 5.2%         | 5.2%         | 4.9%         | 4.4%         |             |
| Other receivables - Sinopec                             | 12.6%        | 0.0%         | 0.0%         | 0.0%         | 0.0%         | 0.0%         | 0.0%         |             |
| FINANCING ACTIVITIES                                    | -27.3%       | -51.5%       | -49.3%       | -42.9%       | -42.5%       | -42.2%       | -41.4%       |             |
| Financial Result  | -5.9%        | -6.5%        | -5.9%        | -5.4%        | -5.4%        | -5.4%        | -5.2%        |             |
| Dividends paid  | -41.4%       | -43.2%       | -40.3%       | -37.2%       | -37.2%       | -37.0%       | -35.9%       |             |
| Debt issuances/repayments                               | 39.1%        | 15.3%        | 10.4%        | 10.9%        | 10.3%        | 9.5%         | 8.1%         |             |
| Interest relating to leasing                            | -6.6%        | -5.9%        | -4.6%        | -3.9%        | -3.5%        | -3.3%        | -2.9%        |             |
| Payments relating to leasings (IFRS 16)                 | -12.4%       | -11.2%       | -8.9%        | -7.3%        | -6.7%        | -6.1%        | -5.4%        |             |
| Change in cash & cash equivalents                       | 26.5%        | -15.1%       | -5.4%        | 5.2%         | 5.6%         | 9.6%         | 15.1%        |             |
| Beginning cash  | 108.3%       | 127.8%       | 95.5%        | 79.3%        | 80.6%        | 81.6%        | 84.3%        |             |
| Ending cash   | 134.8%       | 112.7%       | 90.1%        | 84.6%        | 86.2%        | 91.3%        | 99.4%        |             |

**Appendix 5: Key Financial Ratios**

| Key Financial Ratios                       | 2015     | 2016     | 2017    | 2018     | 2019F    | 2020F    | 2021F    | 2022F    | 2023F    | 2024F    | 2025F    |
|--|----------|----------|---------|----------|----------|----------|----------|----------|----------|----------|----------|
| <b>Efficiency Ratios</b>                   |          |          |         |          |          |          |          |          |          |          |          |
| Fixed Assets Turnover (x)                  | 1.97     | 1.70     | 2.12    | 2.01     | 1.81     | 1.85     | 1.91     | 1.90     | 1.87     | 1.86     | 1.92     |
| Total Assets Turnover (x)                  | 1.21     | 1.05     | 1.26    | 1.35     | 1.11     | 1.15     | 1.18     | 1.18     | 1.16     | 1.14     | 1.14     |
| Receivables Turnover (x)                   | 11.22    | 8.21     | 9.79    | 10.28    | 8.56     | 8.38     | 8.21     | 8.05     | 7.89     | 7.74     | 7.59     |
| Collection Period (DSO) (days)             | 32.54    | 44.44    | 37.29   | 35.52    | 42.62    | 43.53    | 44.44    | 45.36    | 46.27    | 47.18    | 48.09    |
| Inventory Turnover (x)                     | 16.41    | 13.50    | 13.94   | 12.88    | 13.41    | 13.16    | 12.91    | 12.66    | 12.41    | 12.16    | 11.91    |
| Days in Inventory (DIO) (days)             | 22.24    | 27.04    | 26.18   | 28.35    | 27.22    | 27.74    | 28.28    | 28.83    | 29.41    | 30.02    | 30.65    |
| Payables Turnover (x)                      | 9.55     | 6.76     | 7.76    | 7.97     | 7.51     | 7.58     | 7.44     | 7.33     | 7.26     | 7.18     | 7.08     |
| Payables Period (DPO) (days)               | 38.21    | 54.01    | 47.04   | 45.78    | 48.60    | 48.18    | 49.05    | 49.80    | 50.29    | 50.82    | 51.58    |
| Net Operating Cycle or Cash Cycle (days)   | 16.56    | 17.46    | 16.43   | 18.09    | 21.24    | 23.09    | 23.67    | 24.39    | 25.39    | 26.38    | 27.16    |
| Operating Cycle                            | 54.77    | 71.47    | 63.47   | 63.87    | 69.84    | 71.27    | 72.72    | 74.19    | 75.68    | 77.20    | 78.74    |
| <b>Solvency Ratios</b>                     |          |          |         |          |          |          |          |          |          |          |          |
| Long and short-term Debt Ratio (%)         | 27.77%   | 23.38%   | 25.58%  | 25.58%   | 26.01%   | 26.83%   | 27.08%   | 27.36%   | 27.64%   | 27.82%   | 27.60%   |
| Long-term Debt Ratio (%)                   | 23.91%   | 20.73%   | 21.01%  | 21.17%   | 21.74%   | 22.20%   | 22.10%   | 22.03%   | 21.91%   | 21.68%   | 21.08%   |
| Debt to Equity Ratio (x)                   | 0.74     | 0.58     | 0.71    | 0.71     | 0.81     | 0.87     | 0.90     | 0.93     | 0.95     | 0.97     | 0.96     |
| Equity Multiplier (x)                      | 2.07     | 1.90     | 2.09    | 2.10     | 2.32     | 2.35     | 2.34     | 2.31     | 2.29     | 2.26     | 2.21     |
| Debt Ratio                                 | 0.52     | 0.47     | 0.52    | 0.52     | 0.57     | 0.57     | 0.57     | 0.57     | 0.56     | 0.56     | 0.55     |
| Net Debt to EBITDA (x)                     | 2.06     | 1.35     | 0.99    | 0.80     | 0.75     | 0.92     | 0.88     | 0.82     | 0.80     | 0.75     | 0.63     |
| Interest Coverage Ratio (x)                | 8.83     | 16.39    | 79.64   | 124.83   | 10.14    | 9.45     | 11.60    | 13.19    | 13.98    | 14.77    | 16.50    |
| <b>Liquidity Ratios</b>                    |          |          |         |          |          |          |          |          |          |          |          |
| Current Ratio (x)                          | 2.02     | 1.91     | 1.75    | 1.79     | 1.82     | 1.72     | 1.66     | 1.66     | 1.67     | 1.70     | 1.76     |
| Quick Ratio (x)                            | 1.24     | 1.22     | 1.13    | 1.21     | 1.37     | 1.27     | 1.21     | 1.22     | 1.24     | 1.27     | 1.34     |
| Cash Ratio (x)                             | 0.56     | 0.48     | 0.49    | 0.57     | 0.68     | 0.57     | 0.50     | 0.51     | 0.52     | 0.56     | 0.62     |
| <b>Profitability Ratios</b>                |          |          |         |          |          |          |          |          |          |          |          |
| EBITDA Margin (%)                          | 7.58%    | 10.57%   | 12.49%  | 12.69%   | 15.68%   | 14.90%   | 16.39%   | 17.65%   | 18.46%   | 19.31%   | 20.49%   |
| EBIT Margin (%)                            | 2.73%    | 4.12%    | 7.34%   | 8.72%    | 10.90%   | 10.00%   | 11.52%   | 12.70%   | 13.35%   | 14.07%   | 15.21%   |
| Net Profit Margin (%)                      | 1.44%    | 2.27%    | 3.93%   | 3.54%    | 4.07%    | 3.28%    | 4.02%    | 4.53%    | 4.54%    | 4.71%    | 5.16%    |
| ROA (%)                                    | 1.74%    | 2.40%    | 4.96%   | 4.80%    | 4.52%    | 3.77%    | 4.77%    | 5.32%    | 5.25%    | 5.35%    | 5.88%    |
| ROIC (%)                                   | 5.84%    | 5.25%    | 11.97%  | 12.89%   | 14.36%   | 13.22%   | 15.63%   | 17.12%   | 17.75%   | 18.60%   | 20.79%   |
| NOPAT                                      | 288.6    | 368.3    | 759.0   | 1 019.8  | 1 203.0  | 1 169.5  | 1 438.6  | 1 638.8  | 1 757.3  | 1 888.7  | 2 146.4  |
| Invested Capital                           | 4 939.0  | 7 011.0  | 6 339.0 | 7 912.0  | 8 375.7  | 8 846.3  | 9 205.3  | 9 570.3  | 9 901.5  | 153.7    | 323.7    |
| ROCE (%)                                   | 3.94%    | 5.26%    | 11.59%  | 14.90%   | 14.95%   | 14.27%   | 17.10%   | 18.76%   | 19.41%   | 20.12%   | 21.92%   |
| Capital Employed                           | 10 761.0 | 10 281.0 | 9 621.0 | 10 053.0 | 11 816.4 | 12 038.9 | 12 356.8 | 12 830.4 | 13 301.5 | 13 789.3 | 14 386.2 |
| ROE (%)                                    | 4.67%    | 5.98%    | 13.77%  | 13.28%   | 14.12%   | 12.27%   | 15.92%   | 18.01%   | 18.01%   | 18.61%   | 20.53%   |
| ROE (%) - DuPont Approach                  | 4.67%    | 5.98%    | 13.77%  | 13.28%   | 14.12%   | 12.27%   | 15.92%   | 18.01%   | 18.01%   | 18.61%   | 20.53%   |
| NI / S                                     | 1.44%    | 2.27%    | 3.93%   | 3.54%    | 4.07%    | 3.28%    | 4.02%    | 4.53%    | 4.54%    | 4.71%    | 5.16%    |
| S / A                                      | 1.21     | 1.05     | 1.26    | 1.35     | 1.11     | 1.15     | 1.18     | 1.18     | 1.16     | 1.14     | 1.14     |
| A / E                                      | 2.68     | 2.50     | 2.77    | 2.77     | 3.12     | 3.26     | 3.34     | 3.38     | 3.43     | 3.48     | 3.49     |
| <b>Value Creation and Cash Flow Ratios</b> |          |          |         |          |          |          |          |          |          |          |          |
| Economic Value Added (EVA) (M€)            |          |          |         |          | 599.0    | 530.0    | 774.5    | 948.3    | 1 042.8  | 1 156.1  | 1 401.9  |
| Debt Coverage (%)                          |          |          |         |          | 17.39%   | 14.05%   | 17.60%   | 19.46%   | 18.98%   | 19.24%   | 21.31%   |
| Cash to Income                             |          |          |         |          | 0.79     | 0.86     | 0.82     | 0.82     | 0.80     | 0.79     | 0.75     |
| Earnings Quality                           |          |          |         |          | 0.91     | 1.05     | 1.06     | 1.12     | 1.14     | 1.14     | 1.08     |

## Appendix 6: Income Statement Assumptions

| Assumption                                      | Unit    | 2019F           | 2020F    | 2021F    | 2022F    | 2023F    | 2024F    | 2025F    | Notes   |
|---|---------|-----------------|----------|----------|----------|----------|----------|----------|---|
| Portuguese GDP growth                           | YoY     | 1.70%           | 1.70%    | 1.70%    | 1.70%    | 1.70%    | 1.70%    | 1.70%    | Data from European Commission.  |
| Sales and service rendered                      | mEUR    | Sum of segments |          |          |          |          |          |          |   |
| Exploration & Production                        | mEUR    | 1,795.0         | 2,042.8  | 2,339.5  | 2,596.9  | 2,971.2  | 3,268.3  | 3,648.8  | See Appendix 7.   |
| Refining & Marketing                            | mEUR    | 11,768.9        | 12,411.4 | 13,279.4 | 13,295.8 | 13,260.1 | 13,340.0 | 13,974.9 | See Appendix 8.   |
| Gas & Power                                     | mEUR    | 2,816.0         | 2,900.1  | 2,910.6  | 3,250.8  | 3,296.1  | 3,299.8  | 3,298.0  | See Appendix 9.   |
| Other   | YoY     | 1.70%           | 1.70%    | 1.70%    | 1.70%    | 1.70%    | 1.70%    | 1.70%    | Not a business unit, it is expected to follow the economy. Grows at Portugal GDP growth.  |
| Eliminations                                    | % Sales | 1.87%           | 1.87%    | 1.87%    | 1.87%    | 1.87%    | 1.87%    | 1.87%    | Sales between segments are eliminated. Historical average.  |
| Other operating income                          | YoY     | 1.70%           | 1.70%    | 1.70%    | 1.70%    | 1.70%    | 1.70%    | 1.70%    | Company does not disclose much information about it, so we expect it to grow with the economy. Grows at Portugal's GDP.   |
| Cost of sales & Production costs                | mEUR    | Sum of segments |          |          |          |          |          |          |   |
| Exploration & Production                        | % Sales | 18.95%          | 18.65%   | 18.08%   | 18.09%   | 17.56%   | 17.56%   | 17.31%   | See Appendix 7.   |
| Refining & Marketing                            | % Sales | 93.84%          | 95.31%   | 94.31%   | 93.53%   | 94.30%   | 94.43%   | 93.95%   | See Appendix 8.   |
| Gas & Power                                     | % Sales | 95.09%          | 95.17%   | 95.13%   | 95.15%   | 95.14%   | 95.15%   | 95.14%   | See Appendix 9.   |
| Other   | % Sales | 80.8%           | 80.1%    | 80.4%    | 81.1%    | 80.9%    | 81.0%    | 81.2%    | 4Y Moving Average.  |
| Eliminations                                    | % Sales | 1.88%           | 1.88%    | 1.88%    | 1.88%    | 1.88%    | 1.88%    | 1.88%    | 2Y Average over Sales.  |
| RCA Effect                                      | YoY     | 0.0%            | 0.0%     | 0.0%     | 0.0%     | 0.0%     | 0.0%     | 0.0%     | RCA adjustment was added back to treat the data based on IFRS standard. We forecast no change in this value since it is too difficult to do so without a high level of uncertainty.   |
| EBITDA  | mEUR    | Sum of segments |          |          |          |          |          |          |   |
| Exploration & Production                        | % Sales | 81.1%           | 81.3%    | 81.9%    | 81.9%    | 82.4%    | 82.4%    | 82.7%    | See Appendix 7.   |
| Refining & Marketing                            | % Sales | 6.2%            | 4.7%     | 5.7%     | 6.5%     | 5.7%     | 5.6%     | 6.1%     | See Appendix 8.   |
| Gas & Power                                     | % Sales | 4.9%            | 4.8%     | 4.9%     | 4.8%     | 4.9%     | 4.9%     | 4.9%     | See Appendix 9.   |
| Other   | % Sales | 19%             | 20%      | 20%      | 19%      | 19%      | 19%      | 19%      | 4Y Moving Average.  |
| Eliminations                                    | % Sales | 4%              | 0%       | -5%      | -6%      | -6%      | -6%      | -10%     | 2Y Average over Sales.  |
| D&A, Provisions & Impairments                   | mEUR    | Sum of segments |          |          |          |          |          |          |   |
| Exploration & Production                        | mEUR    | 573.1           | 641.9    | 712.5    | 790.9    | 877.9    | 731.5    | 146.3    | See Appendix 10 for detailed forecast   |
| Refining & Marketing                            | mEUR    | 279.6           | 314.6    | 332.1    | 332.1    | 314.6    | 91.2     | 1,283.6  | See Appendix 10 for detailed forecast   |
| Gas & Power                                     | mEUR    | 45.5            | 48.3     | 64.5     | 69.7     | 91.2     | 1,283.6  | 0.0      | See Appendix 10 for detailed forecast   |
| Other   | YoY     | 0.0%            | 0.0%     | 0.0%     | 0.0%     | 0.0%     | 0.0%     | 0.0%     | No historical values.   |
| Eliminations                                    | YoY     | 0.0%            | 0.0%     | 0.0%     | 0.0%     | 0.0%     | 0.0%     | 0.0%     | No historical values.   |
| Provisions                                      | YoY     | 12%             | 12%      | 11%      | 11%      | 11%      | 10%      | 10%      | Decommissioning/Environmental Matters Costs represent half of the value. With the increase in production/drills, it's expected to increase over time based on the increase in WIP.<br>The increase is based on the WIP CAGR |
| Net financial expenses                          | %       | 2.5%            | 2.5%     | 2.5%     | 2.5%     | 2.5%     | 2.5%     | 2.5%     | Average cost of financial debt reported in 2018. Will be multiplied by the debt from t-1.   |
| Exchange gains/losses & derivatives             | %       | 0.0%            | 0.0%     | 0.0%     | 0.0%     | 0.0%     | 0.0%     | 0.0%     | No change YoY. Mostly related to Hedging Instruments, of which there's not enough data available to correctly predict its value   |
| Operating leases interest (IFRS 16)             | %       | 7.7%            | 7.7%     | 7.7%     | 7.7%     | 7.7%     | 7.7%     | 7.7%     | % over Operating Leases Liabilities. Gathered from historical information   |
| Results from financial investments              | YoY     | 0.0%            | 0.0%     | 0.0%     | 0.0%     | 0.0%     | 0.0%     | 0.0%     | No change YoY. Mostly related to ventures connected to the operational segments, of which there's not enough data available to correctly predict its value  |
| Income taxes                                    | % EBT   | 31.5%           | 31.5%    | 31.5%    | 31.5%    | 31.5%    | 31.5%    | 31.5%    | Both taxes were calculated through the historical data made available by the company in the income statement and the note regarding the effective tax rate  |
| SPT&IRP   | % EBIT  | 30.0%           | 30.0%    | 30.0%    | 30.0%    | 30.0%    | 30.0%    | 30.0%    |   |
| Energy sector extraordinary contribution (CESE) | YoY     | 0.0%            | 0.0%     | 0.0%     | 0.0%     | 0.0%     | 0.0%     | 0.0%     | 2Y Moving Average. Related to the operations in the R&M and G&P.  |
| Non-controlling interests                       | % EBIT  | 9.0%            | 9.5%     | 9.3%     | 9.4%     | 9.3%     | 9.4%     | 9.3%     | 2Y Moving Average over Operating result.  |
| Dividends                                       | YoY     | 10.0%           | 10.0%    | 10.0%    | 5.0%     | 5.0%     | 5.0%     | 5.0%     | The company aims a dividend increase YoY of 10% until 2021, to which we deem sustainable, however from there on we assumed a 5.0% YoY growth, reaching EUR 1,02 in 2025, which represents a c.50% growth from 2018 values.  |

## Appendix 7: Statement of Financial Position Assumptions

| Assumption                                   | Unit               | 2019F  | 2020F | 2021F | 2022F | 2023F | 2024F | 2025F | Notes  |
|--|--------------------|--------|-------|-------|-------|-------|-------|-------|--|
| <b>Non-current assets</b>                    |                    |        |       |       |       |       |       |       |  |
| Tangibles assets                             | % of Assets        | 37.8%  | 38.0% | 37.8% | 37.3% | 37.0% | 36.2% | 34.8% | Tangible assets t = Tangible t-1 + CAPEX (for tangible assets) t - D&A (for tangible assets) t. Appendix 10  |
| Rights of use                                | % of Assets        | 8.6%   | 8.1%  | 7.7%  | 7.3%  | 7.0%  | 6.7%  | 6.3%  | Rights of use t = Tangible t-1 + CAPEX (for op. leases) t - D&A (for op. leases) t. Appendix 10  |
| Goodwill                                     | YoY                | 0.0%   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | Goodwill is subject to Impairment Testing and assumed to remain constant over the period.  |
| Intangible assets                            | % of Assets        | 4%     | 5%    | 5%    | 5%    | 5%    | 6%    | 6%    | Intangible assets t = Intangible t-1 + CAPEX (for intangible assets) t - D&A (for intangible assets) t. Appendix 10  |
| Investments in associates and joint ventures | %                  | 8.6%   | 8.2%  | 8.9%  | 9.1%  | 9.4%  | 9.8%  | 10.3% | Value from t-1 + Result from financial investments / Most companies related to these joint ventures are related to E&P operations, which means that the value of these companies should increase as the sales increase over time, driven mostly due to increasing operations |
| Deferred tax assets                          | YoY                | 0.0%   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | Equal to the 2018 nominal value, offset effect with deferred tax liabilities   |
| Other receivables                            | % Sales            | 1.5%   | 1.5%  | 1.5%  | 1.5%  | 1.5%  | 1.5%  | 1.5%  | 4y average of % over sales. Mainly from related to receivables from E&P partners   |
| Other financial assets                       | YoY                | 0.0%   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | Hedging; keep same value. Too difficult to predict.  |
| <b>Current assets</b>                        |                    |        |       |       |       |       |       |       |  |
| Inventory                                    | Inventory Turnover | 13.4   | 13.2  | 12.9  | 12.7  | 12.4  | 12.2  | 11.9  | To do based on inventory days and inventory turnover, with the 2019E from a 2y average used. Will slightly decrease over time since there will be an increase in production.   |
| Rights of use                                | %                  | 0.10   | 0.10  | 0.10  | 0.10  | 0.10  | 0.10  | 0.10  | Over Non-Current Rights of Use t-1   |
| Other financial investments                  | YoY                | 0.0%   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | Hedging; keep same value. Too difficult to predict.  |
| Trade receivables                            | % Sales            | 8.0%   | 8.3%  | 8.5%  | 8.8%  | 9.0%  | 9.3%  | 9.5%  | Trade receivables have historically increased, thus we increased 0,25% every year.   |
| Other receivables                            | % Sales            | 3.7%   | 3.7%  | 3.7%  | 3.7%  | 3.7%  | 3.7%  | 3.7%  | 4y average. Mainly from related to receivables from E&P partners   |
| Loans to Sinopec                             | % Assets           | 100.0% | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | Ended in 2019  |
| <b>Non-current liabilities</b>               |                    |        |       |       |       |       |       |       |  |
| Debt   | %                  | 33%    | 33%   | 33%   | 33%   | 33%   | 33%   | 33%   | Capital structure is expected to be the same, so a 2Y moving average is used to define the debt levels.  |
| Other payables                               | YoY                | 0.0%   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | Value to be kept constant since there is not much information disclosed by the company.  |
| Post-employment liabilities                  | YoY                | 0.0%   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | Assets are relatively stable through the years, with the same happening with the expected payments to the pension plan fund.   |
| Deferred tax liabilities                     | YoY                | 0.0%   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | Equal to the 2018 nominal value and assumed to remain constant, as there is an offset effect with deferred tax assets.   |
| Other financial instruments                  | YoY                | 0.0%   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | Hedging costs, we assume this value will be constant.  |
| Provisions                                   | mEUR               | 29.0   | 37.3  | 30.4  | 32.3  | 33.3  | 32.0  | 32.5  | Provisions include decommissioning costs and CESE values. These are hard to predict, so a 3y moving average was used to obtain the contribution for CESE.  |
| <b>Current liabilities</b>                   |                    |        |       |       |       |       |       |       |  |
| Debt   | YoY                | 10.0%  | 10.0% | 10.0% | 10.0% | 10.0% | 10.0% | 10.0% | Expected to follow the increase registered in the Non-Current Liabilities. The increase will be higher as there will be non-current debt with maturity during the forecast horizon.  |
| Trade payables & Other payables              | % Sales            | 11%    | 11%   | 11%   | 11%   | 11%   | 11%   | 11%   | Percentage obtained with a 4Y average from TP/Sales.   |
| Other financial instruments                  | YoY                | 0.0%   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | Hedging costs, we assume this value will be constant.  |
| Current income tax payable                   | YoY                | 0.0%   | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | 0.0%  | We assume this value will be constant, as estimation of uncertain tax positions might be too uncertain.  |
| Payments relating to leasing                 | %                  | 5.50%  | 5.50% | 5.50% | 5.50% | 5.50% | 5.50% | 5.50% | Related to IFRS 16, based on historical values (only quarterly reports of 2019 are available).   |

## Appendix 8: Sales & EBITDA breakdown for E&P

| E&P key figures       | Unit    | 2019E | 2020F | 2021F | 2022F | 2023F | 2024F | 2025F |
|-----------------------|---------|-------|-------|-------|-------|-------|-------|-------|
| Avg WIP               | kboe/d  | 120.2 | 134.6 | 149.4 | 165.8 | 184.1 | 202.5 | 222.7 |
| WI oil #              | kboe/d  | 106   | 118   | 131   | 146   | 162   | 178   | 196   |
| WI gas #              | kboe/d  | 15    | 16    | 18    | 20    | 22    | 25    | 27    |
| Oil Discount on Brent | %       | 80%   | 80%   | 80%   | 80%   | 80%   | 80%   | 80%   |
| Gas Discount on Brent | %       | 30%   | 30%   | 30%   | 30%   | 30%   | 30%   | 30%   |
| Brent price           | USD/bbl | 62    | 63    | 65    | 65    | 67    | 67    | 68    |
| E&P Sales             | mEUR    | 1795  | 2043  | 2340  | 2597  | 2971  | 3268  | 3649  |
| Production costs      | mEUR    | 192   | 215   | 239   | 266   | 295   | 325   | 358   |
| Royalties             | mEUR    | 148   | 166   | 184   | 204   | 226   | 249   | 274   |
| EBITDA                | mEUR    | 1455  | 1662  | 1916  | 2127  | 2450  | 2694  | 3017  |
| EBITDA Margin         | %       | 81%   | 81%   | 82%   | 82%   | 82%   | 82%   | 83%   |

| E&P Assumptions    | Unit    | 2019F | 2020F  | 2021F | 2022F  | 2023F | 2024F  | 2025F | Note  |
|--------------------|---------|-------|--------|-------|--------|-------|--------|-------|---|
| WIP                | YoY     | 12%   | 12%    | 11%   | 11%    | 11%   | 10%    | 10%   | GALP presented their expectations for the WIP growth: 12% CAGR from 2018 to 2019, 12-16% CAGR from 2018 to 2020, and a >10% CAGR up to 2030. For our forecast we projected the WIP close to the minimum value given, with a 10,8% CAGR. |
| Oil price          | USD/bbl | 62    | 63     | 65    | 65     | 67    | 67     | 68    | Brent oil price forecast is extremely hard due to its volatility, so based on our research we decided to keep the price steadily increasing over time.  |
| Oil ASP over Brent | %       | 80%   |        |       |        |       |        |       | Computed based on information given by GALP   |
| Gas ASP over Brent | %       | 30%   |        |       |        |       |        |       | Computed based on information given by GALP.  |
| USD/EUR            | x€/€    | 0.89  |        |       |        |       |        |       | Foreign exchange forecast is extremely hard due to its volatility, so we decided to use an external source for FX (IMF)   |
| Royalties          | USD/bbl | 3     |        |       |        |       |        |       | Computed based on information given by GALP   |
| E&P prod cost      | USD/bbl | 3.9   | 3.9025 | 3.905 | 3.9075 | 3.91  | 3.9125 | 3.915 | We assume rather constant production costs due to economies of scale and several production units in plateau. Takes into account IFRS 16.   |

### Sales from E&P

Sales from the E&P segment comes from the production that the company achieves (average WIP times 365 days) and the Brent price. It will also be influenced by the discount at which GALP sells their oil and gas production and that oil and gas will have in the WIP of the company. The production is expected to grow considerably for 2019-2025F, with a 10.8% CAGR. This increase in production will mainly come from the increase in the number of FPSOs in the Lula-Iracema projects, the new projects that will enter production in Brazil and Angola, and finally the start of the Coral FLNG project. This CAGR is way below the historical figure, but we decided to follow GALP's expectations. The Brent price forecast predicts a slow increase of the Brent price, achieving \$67/boe by 2023F. This expected increase in Brent Price will positively affect the company's sales. For the discount over Brent for oil and gas we follow the company lead of attributing 30% of Brent spot price for Gas, and, through comparisons with the historical ASP, 80% of the Brent Spot price for Oil. Finally, the production mix is expected to maintain the same weight for oil and gas since the increase in Gas is only expected to happen when the Coral South FLNG and Rovuma LNG start to operate at plateau. Overall, the sales are expected to significantly increase, yielding a 12% 2019-2025F CAGR.

### EBITDA from E&P

For the E&P segment we will have two main operational costs: production costs and royalties. Productions are set at \$3.9/boe for 2019F, based on historical information. This value is expected to have a small upward trend, but it will still average 3.9\$ for 2019-2025F. This can be explained by the stable weight of production that will come from Brazil, therefore maintaining the small production costs that the company will incur. There could be a variation in the production costs based on the increase in projects that will come from outside the BM-S-11 block, but the increase in production in the BM-S-11 may lead to economies of scale and a slight decrease in costs in those projects. The royalties are also expected to be maintained around the historical value, standing at \$3.3/boe for 2019-2025F. The forecasted evolution of the operational costs will lead to a stable EBITDA Margin for the segment. Therefore, the increase in sales of the segment will lead to stable increase in segment's EBITDA.

### Appendix 9: Sales & EBITDA breakdown for R&M

| R&M                    | Unit     | 2019F    | 2020F     | 2021F     | 2022F     | 2023F     | 2024F     | 2025F     |
|------------------------|----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Used Capacity          | %        | 80%      | 90%       | 95%       | 95%       | 90%       | 90%       | 95%       |
| Raw material processed | kboe     | 96,360.0 | 108,405.0 | 114,427.5 | 114,427.5 | 108,405.0 | 108,405.0 | 114,427.5 |
| ASP                    | USD/boe  | 70.2     | 71.3      | 73.6      | 73.6      | 75.8      | 75.8      | 77.0      |
| Brent                  | USD/boe  | 62.0     | 63.0      | 65.0      | 65.0      | 67.0      | 67.0      | 68.0      |
| Refining Cost          | USD/boe  | 3.7      | 2.8       | 2.4       | 2.4       | 2.8       | 2.8       | 2.4       |
| Refining Margin        | USD/boe  | 4.5      | 5.5       | 6.2       | 6.2       | 6.0       | 6.0       | 6.6       |
| Refining ASP (Eur/boe) | EUR/boe  | 62.5     | 63.5      | 65.5      | 65.5      | 67.5      | 67.5      | 68.5      |
| Refining Sales         | mEUR     | 6,019.2  | 6,880.8   | 7,493.7   | 7,493.7   | 7,317.7   | 7,317.7   | 7,839.5   |
| Refing Cost (Eur/Boe)  | EUR/boe  | 58.5     | 58.6      | 60.0      | 60.0      | 62.2      | 62.2      | 62.7      |
| Refining Cost          | mEUR     | 5,632.7  | 6,352.3   | 6,866.1   | 6,866.1   | 6,738.2   | 6,738.2   | 7,171.6   |
| Refining EBITDA        | mEUR     | 386.5    | 528.6     | 627.6     | 627.6     | 579.5     | 579.5     | 667.9     |
| Total oil products     | mton     | 17.1     | 17.4      | 17.7      | 18.0      | 18.3      | 18.6      | 18.9      |
| Marketing ASP          | EUR/mton | 336.5    | 318.3     | 327.4     | 322.8     | 325.1     | 324.0     | 324.6     |
| Marketing Cost         | EUR/mton | 316.7    | 315.2     | 320.1     | 309.9     | 315.5     | 315.2     | 315.2     |
| Marketing Sales        | mEUR     | 5,749.7  | 5,530.5   | 5,785.7   | 5,802.1   | 5,942.4   | 6,022.3   | 6,135.4   |
| Marketing Cost         | mEUR     | 5,411.7  | 5,476.7   | 5,657.1   | 5,568.9   | 5,766.2   | 5,858.3   | 5,957.8   |
| Marketing EBITDA       | mEUR     | 338.0    | 53.8      | 128.6     | 233.2     | 176.3     | 163.9     | 177.6     |
| Sales                  | mEUR     | 11,768.9 | 12,411.4  | 13,279.4  | 13,295.8  | 13,260.1  | 13,340.0  | 13,974.9  |
| Total cost             | mEUR     | 11,044.4 | 11,829.0  | 12,523.2  | 12,435.0  | 12,504.4  | 12,596.5  | 13,129.4  |
| EBITDA                 | mEUR     | 724.5    | 582.4     | 756.2     | 860.8     | 755.8     | 743.4     | 845.5     |

| R&M Assumptions            | Unit     | 2019F  | 2020F  | 2021F  | 2022F  | 2023F  | 2024F  | 2025F  | Note   |
|----------------------------|----------|--------|--------|--------|--------|--------|--------|--------|--|
| Used Capacity              | %        | 80%    | 90%    | 95%    | 95%    | 90%    | 90%    | 95%    | Percentage of the installed capacity that is used in the refinery. After the maintenance operations, we expected the company to recover to historical maximum, which is above 90%. |
| Refining Margin            | USD/bbl  | 4.51   | 5.48   | 6.16   | 6.16   | 6.01   | 6.01   | 6.56   | Amount of USD/bbl GALP realizes on each barrel of oil that is refined. Similar to usage capacity, after the maintenance operations, we expect the refining margin to recover.      |
| Refining Cost              | USD/bbl  | 3.68   | 2.84   | 2.42   | 2.42   | 2.84   | 2.84   | 2.42   | Cost to refine 1 barrel of oil. Expected to decrease due to an increase in efficiency (maintenance operations).  |
| Refining ASP               | USD/bbl  | 70.19  | 71.32  | 73.58  | 73.58  | 75.85  | 75.85  | 76.98  | Average selling price of the by-products from the refining of one barrel of oil.   |
| Total Oil Sales (Quantity) | mton     | 17.09  | 17.38  | 17.67  | 17.97  | 18.28  | 18.59  | 18.90  | Amount of oil by-products sold by the Marketing BU. The growth will follow the Portugal GDP YoY.   |
| Marketing ASP              | USD/mton | 336.52 | 318.29 | 327.40 | 322.84 | 325.12 | 323.98 | 324.55 | Average selling price of by-products. 2Y moving average.   |
| Marketing Costs            | USD/mton | 316.74 | 315.19 | 320.13 | 309.87 | 315.48 | 315.17 | 315.16 | Operational costs. 4Y moving average.  |

### Sales from Refining

The sales from the Refining Business Unit are accessed through the multiplication of the Average Selling Price per kboe and the amount of Raw Material Processed (kboe) from the Refining system of the company. The quantity of Raw Material Processed will come from the multiplication of the Used Capacity with the installed Refining Capacity (a constant 330 kboe/d or 120450 kboe per annum).

The Average Selling Price was obtained as function of the Brent Price, with the value throughout the forecast being the 4Y historical average of the ASP over Brent times the value of the Brent for each period. With an expected increase in the Brent Price in the forecast horizon, the ASP will consequently register. The Used Capacity of the Refining system is expected to register a slight decline in 2019E because of maintenance operations. Afterwards, we predict an increase based on historical values and operational improvements from the maintenance operations.

### EBITDA from Refining

In the Refining BU the main benchmark of the operational efficiency will be the Refining Margin. The Refining Margin will come from the difference between the value obtained through the sales of the refined products and the operational costs (Brent price plus the production costs). The production costs will be dependent of the efficiency of the refineries and the economies of scale that will come from higher degrees of Used Capacity. In our forecast the production costs are expected to decrease when compared with historical values, as a result of the increase in efficiency. As stated previously, the Brent price is expected to increase over the years. The result of the decrease in production costs, the increase in Brent price and ASP will yield an average \$5.8/boe Refining Margin. Consequently, the EBITDA of this BU will increase throughout the years, reaching a maximum value in 2025F where we have a \$67/boe Brent price and a 95% Used Capacity.

### Sales from Marketing

The sales from the Marketing BU will come from the multiplication of the Total Sales of Oil Products (mton) and the Average Selling Price per mton. The historical ASP for the BU was obtained as the division of the sales from the BU (difference between R&M sales and the Refining BU Sales) with the Total Sales oil products. The Average Selling Price was obtained as a 2Y moving average. The Total Sales of Oil Products are predicted to grow along the lines of the growth of the GDP of Portugal (GALP's main market), as a growth in the demand of energy is associated with the growth of the economy. This will lead to an increase in sales throughout the years, reaching the maximum value in 2025F.

### EBITDA from Marketing

The operational costs from the BU were achieved through a 4Y moving average. This can be justified by the fact that the company is the current market leader in Portugal and will therefore be able to maintain their current level of costs. Over the 2019-2025F the EBITDA Margin will have an average value of 3.1%, 1% increase over the 4Y historical average.

### Appendix 10: Sales & EBITDA breakdown for G&P

| G&P                              | Unit | 2019F   | 2020F   | 2021F   | 2022F   | 2023F   | 2024F   | 2025F   |
|----------------------------------|------|---------|---------|---------|---------|---------|---------|---------|
| Sales                            | M€   | 2,816.0 | 2,900.1 | 2,910.6 | 3,250.8 | 3,296.1 | 3,299.8 | 3,298.0 |
| Cost of sales & Production costs | M€   | 2,677.7 | 2,760.2 | 2,768.8 | 3,093.2 | 3,136.0 | 3,139.6 | 3,137.8 |
| RCA Ebitda                       | M€   | 138.3   | 140.0   | 141.7   | 157.6   | 160.1   | 160.1   | 160.1   |
| Supply & Trading                 | M€   | 92.2    | 93.0    | 93.9    | 108.8   | 109.8   | 110.8   | 111.8   |
| Power                            | M€   | 46.2    | 46.9    | 47.9    | 48.8    | 50.4    | 52.0    | 53.6    |

| G&P Assumptions          | Unit | 2019F | 2020F | 2021F | 2022F | 2023F | 2024F | 2025F | Note   |
|--------------------------|------|-------|-------|-------|-------|-------|-------|-------|--|
| Gas Demand CAGR          | %    | 1.8   | 1.8   | 1.8   | 1.8   | 1.8   | 1.8   | 1.8   | European commission  |
| Trading Increase         | %    | 0.0   | 0.0   | 0.0   | 30.0  | 0.0   | 0.0   | 0.0   | From GALP's financial statements. Contract that will provide 1 mta of NG from 2022 onward, for trading only.   |
| Electricity Demand CAGR  | %    | 1.4   | 1.4   | 1.4   | 1.4   | 1.4   | 1.4   | 1.4   | European commission  |
| Electricity sold to grid | %    | 2.0   | 2.0   | 2.5   | 2.5   | 5.0   | 5.0   | 5.0   | Electricity sold to the grid is expected to rise due to increases in CAPEX, as GALP is focused in increasing low-carbon solutions in its portfolio. This decision is one more step into the energy transition. |

### Sales from G&P

The sales from the G&P segment were calculated through as a function of the EBITDA of the segment. They will come from the sum of the EBITDA from the Supply & Trade BU and the Power BU. As the EBITDA Margin of the segment was forecasted as a 2Y Moving Average, it will present a relatively stable value throughout the years. With the expected increase of the EBITDA between 2019-2025F, it's expected that the segment sales will increase over the years.

### EBITDA from Supply & Trade

The Supply and Trade BU EBITDA for each YE is retrieved as a function of the previous year value, the increase in NG demand in Portugal and the expected growth of the trading activity. The increase in the demand of the NG in the Iberian Peninsula can be applied to the company since the company presents a stable market share of 12%. The increase in trading activity is considered to be zero over the years, with the exception of 2022F where the LNG contract will increase significantly the trading activity of GALP.

### EBITDA from Power

For the Power BU EBITDA of each YE, the value is achieved as a function of the value from the previous year, the growth in energy demand in Portugal and the growth in electricity sold to the grid. The growth in energy demand in Portugal is expected to be followed by the company since the company can easily follow it by increasing the amount of electricity bought from the grid and sold to end clients. The growth in electricity sold to the grid is expected to grow over the years at different rates since it will mainly be explained by the increase in CAPEX of the segment, since this CAPEX will be mainly applied to renewable energy generation facilities.

## Appendix 11: GALP's CAPEX & DD&A

| CAPEX (with IFRS 16, M€)     | 2018         | 2019E          | 2020F          | 2021F          | 2022F          | 2023F          | 2024F          | 2025F          | CAGR 19-25F  |
|------------------------------|--------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|--------------|
| Exploration and Production   | 404.4        | 453.4          | 558.2          | 575.7          | 655.5          | 682.9          | 669.3          | 655.9          | 6.35%        |
| Exploration and Appraisal    | 215.7        | 182.4          | 140.2          | 145.8          | 153.1          | 160.8          | 157.5          | 154.4          | -2.74%       |
| Total E&P (includes leasing) | 620.0        | 635.8          | 698.4          | 721.5          | 808.6          | 843.7          | 826.8          | 810.3          | 4.12%        |
| R&M (includes leasing)       | 260.6        | 349.8          | 311.8          | 324.3          | 289.5          | 304.0          | 297.9          | 291.9          | -2.97%       |
| G&P                          | 9.0          | 18.2           | 18.7           | 24.3           | 25.5           | 32.2           | 31.5           | 30.9           | 9.17%        |
| <b>Total</b>                 | <b>889.6</b> | <b>1,003.9</b> | <b>1,029.0</b> | <b>1,070.1</b> | <b>1,123.6</b> | <b>1,179.8</b> | <b>1,156.2</b> | <b>1,133.1</b> | <b>2.04%</b> |

| CAPEX Assumptions                | Unit | 2019F | 2020F | 2021F | 2022F   | 2023F   | 2024F   | 2025F   | Note  |
|----------------------------------|------|-------|-------|-------|---------|---------|---------|---------|---|
| CAPEX growth                     | YoY  | 2.5%  | 2.5%  | 4.0%  | 5.0%    | 5.0%    | -2.0%   | -2.0%   | We assume that CAPEX evolves YoY, following the data given by the company.        |
| CAPEX (without Operating Leases) | M€   | 911.9 | 934.7 | 972.1 | 1,020.7 | 1,071.7 | 1,050.3 | 1,029.3 | Value in M€. Previous year CAPEX times (1+growth).                                |
| E&P Prod                         | %    | 43.0% | 53.0% | 52.5% | 57.5%   | 57.0%   | 57.0%   | 57.0%   | % of total CAPEX. Calculated based on historical values and expected investments. |
| E&P Appraisal                    | %    | 20.0% | 15.0% | 15.0% | 15.0%   | 15.0%   | 15.0%   | 15.0%   | % of total CAPEX. Calculated based on historical values and expected investments. |
| Exploration & Production         | %    | 63.0% | 68.0% | 67.5% | 72.5%   | 72.0%   | 72.0%   | 72.0%   | % of total CAPEX. Calculated based on historical values and expected investments. |
| Refining & Marketing             | %    | 35.0% | 30.0% | 30.0% | 25.0%   | 25.0%   | 25.0%   | 25.0%   | % of total CAPEX. Calculated based on historical values and expected investments. |
| Gas & Power                      | %    | 2.0%  | 2.0%  | 2.5%  | 2.5%    | 3.0%    | 3.0%    | 3.0%    | % of total CAPEX. Calculated based on historical values and expected investments. |
| CAPEX linked to operating leases | %    |       |       |       | 10.1%   |         |         |         | % CAPEX w/o Operating leases.   |
| Total                            | M€   | 92.0  | 94.3  | 98.1  | 103.0   | 108.1   | 106.0   | 103.8   | Value in M€.  |
| Exploration & Production         | %    | 67%   | 67%   | 67%   | 67%     | 67%     | 67%     | 67%     | 2/3 of total based on historical weights of the leases of each segment.           |
| Refining & Marketing             | %    | 33%   | 33%   | 33%   | 33%     | 33%     | 33%     | 33%     | 1/3 of total based on historical weights of the leases of each segment.           |

Taking into account the historical investment and the company's targets for CAPEX, we see an increase for all segments, all for different reasons, always above € 1bn, even reaching almost 1,2 in 2023F. E&P CAPEX is the most demanding, as it is divided in sub-sectors: Production and Appraisal; this is linked to increases in production (e.g. more production units) and in continuous efforts to make viable production in current non-producing blocks or further increase their portfolio through acquisition of concessions in bidding rounds. R&M segment will have a significant decrease in their CAPEX since most of its historical CAPEX comes from maintenance operations that happened between 2017 and 2019, with no further operations expected to happen throughout the forecast horizon.

| D&A (with IFRS 16, M€)       | 2018         | 2019E        | 2020F        | 2021F        | 2022F        | 2023F        | 2024F          | 2025F          | CAGR 19-25F  |
|------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------|----------------|--------------|
| Exploration and Production   | 289.4        | 402.3        | 430.6        | 460.1        | 493.5        | 531.3        | 569.9          | 612.3          | 7.25%        |
| Exploration and Appraisal    | 57.9         | 63.4         | 69.5         | 75.8         | 82.8         | 90.6         | 98.4           | 107.1          | 9.13%        |
| Total E&P (includes leasing) | 347.3        | 465.7        | 500.1        | 535.9        | 576.4        | 621.9        | 668.3          | 719.3          | 7.52%        |
| R&M (includes leasing)       | 337.2        | 235.5        | 258.3        | 269.4        | 268.6        | 256.0        | 255.7          | 267.4          | 2.14%        |
| G&P                          | 5.3          | 44.0         | 45.1         | 58.6         | 61.6         | 77.6         | 76.0           | 74.5           | 9.17%        |
| Other                        | 4.0          | 4.0          | 4.0          | 4.0          | 4.0          | 4.0          | 4.0            | 4.0            | 0.00%        |
| <b>Total</b>                 | <b>689.8</b> | <b>749.1</b> | <b>807.6</b> | <b>867.9</b> | <b>910.5</b> | <b>959.5</b> | <b>1,004.0</b> | <b>1,065.2</b> | <b>6.04%</b> |

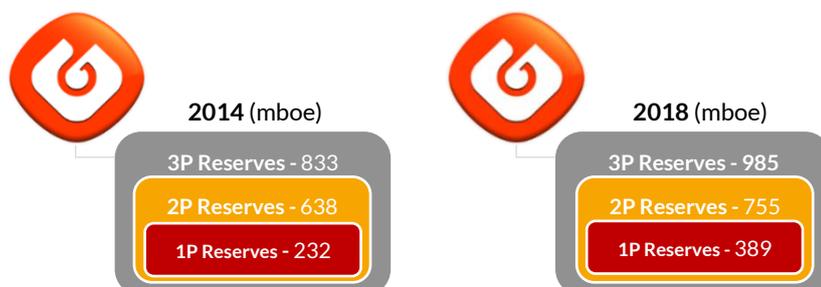
| D&A Assumptions          | Unit | 2019F | 2020F | 2021F | 2022F | 2023F | 2024F | 2025F | Note  |
|--------------------------|------|-------|-------|-------|-------|-------|-------|-------|---|
| D&A                      | mEUR | 620.9 | 683.0 | 746.4 | 791.3 | 841.9 | 887.4 | 949.6 |   |
| EP Total                 | %    | 61.2% | 61.1% | 60.9% | 62.8% | 64.6% | 66.6% | 67.6% | Based on historical values, and adapted to capture the UoP method that is applied to some of the assets |
| EP Prod                  | %    | 51.0% | 50.9% | 50.8% | 52.3% | 53.8% | 55.5% | 56.4% | 84% of total E&P, based on 4Y average   |
| EP Appraisal             | %    | 10.2% | 10.2% | 10.2% | 10.5% | 10.8% | 11.1% | 11.3% | 16% of total E&P, based on 4Y average   |
| Refining & Marketing     | %    | 31.0% | 31.7% | 30.7% | 28.9% | 25.8% | 24.4% | 24.1% | Based on historical values, and adapted to capture the UoP method that is applied to some of the assets |
| Gas & Power              | %    | 7.1%  | 6.6%  | 7.9%  | 7.8%  | 9.2%  | 8.6%  | 7.8%  | Based on the 2Y historical average of D&A/CAPEX   |
| Other                    | %    | 0.6%  | 0.6%  | 0.5%  | 0.5%  | 0.5%  | 0.5%  | 0.4%  | Fixed value, based on historical figures  |
| D&A for Operating Leases | %    |       |       |       | 10.0% |       |       |       | % D&A w/o Operating leases  |
| Total                    | mEUR | 128.2 | 124.6 | 121.6 | 119.2 | 117.6 | 116.6 | 115.6 | Value in €m   |
| E&P                      | %    | 67%   | 67%   | 67%   | 67%   | 67%   | 67%   | 67%   | 2/3 of total based on historical weights of the leases of each segment                                  |
| R&M                      | %    | 33%   | 33%   | 33%   | 33%   | 33%   | 33%   | 33%   | 1/3 of total based on historical weights of the leases of each segment                                  |

D&A rates for each segment are obtained via historical percentages, but differently for all segments, as some also consider production. For the latter one, our calculations focus in capturing the existing straight-line D&A and also the one linked to UoP.

## Appendix 12: GALP's Reserves

Resources and reserves are key for Oil and Gas companies operating in the E&P as they constitute one of the drivers of profitability for the segment. This way, it is important to understand the difference between the two, considering that only the latter are in fact considered assets and incorporated in the companies' balance sheet.

Resources are classified as being contingent or prospective. The latter include quantities of oil and NG that companies estimate to recover from unknown deposits of their future projects. Contingent resources are those quantities estimated from known deposits that are not yet considered as commercially recoverable.



Reserves constitute the quantities of oil and NG expected to be commercially recoverable from known deposits. According to the probability of being recovered, reserves are classified as 1P (Proved Reserves), 2P (Proved and Probable) and 3P (Proved, Probable and Possible). Oil and Gas companies' total amount of reserves will correspond to the volume of their 3P reserves, which are the quantities with an associated probability of at least 10%. Then, 2P reserves will include those with an above 50% probability of being recovered. Finally, 1P reserves will correspond to 90% probability.

GALP's level of reserves has been increasing, mostly explained by the company's presence in projects with high levels of production, such as the ones in Block BM-S-11, in Brazil.

## Appendix 13: WACC Assumptions

Four WACC rates were computed. One for each of the company's sectors – E&P, R&M and G&P – and one for the company as a whole. These rates differ as risk free rate, leveraged beta and the Market Risk Premium change to account for country and industry specific realities. WACC rates will change YOY reflecting small changes in GALP's capital structure. We considered the company's target capital structure to be composed of 80% equity and 20% debt.

### Cost of Equity

In order to compute the cost of equity we used the CAPM model ( $CAPM = R_e = RFR + \beta * MRP$ ).

| GALP                      |       |  |
|---------------------------|-------|--|
| Risk Free Rate (RFR)      | 1.10% | 10Y Government Bond yields for Germany as of 7th of January 2020. See point 1.   |
| Country Risk Premium      | 1.50% | CRP (over German risk-free rate) for Portugal. See point 2.  |
| Beta ( $\beta$ )          | 0.92  | Monthly adjusted levered Betas for GALP's (as a whole) peers, which were unlevered considering each peers capital structure and effective tax rate. An average of those unlevered betas was, then, leveraged using GALP's 2019 capital structure. See point 4. |
| Market Risk Premium (MRP) | 6.30% | Excess Market Premium for Portugal. See point 3.   |
| Terminal Growth Rate (g)  | 2.00% | Appendix 14  |

| Exploration and Production |       |   |
|----------------------------|-------|---|
| Risk Free Rate (RFR)       | 1.10% | 10Y Government Bond yields for Germany as of 7th of January 2020. See point 1.  |
| Country Risk Premium       | 6.10% | CRP (over German risk-free rate) for Brazil. See point 2.   |
| Beta ( $\beta$ )           | 0.73  | Monthly adjusted levered Betas for GALP's E&P peers, which were unlevered considering each peers capital structure and effective tax rate. An average of those unlevered betas was, then, leveraged using GALP's 2019 capital structure. See point 4. |
| Market Risk Premium (MRP)  | 4.50% | Excess Market Premium for Brazil. See point 3.  |
| Terminal Growth Rate (g)   | 2.50% | Appendix 14   |

| Refining and Marketing    |       |   |
|---------------------------|-------|---|
| Risk Free Rate (RFR)      | 1.10% | 10Y Government Bond yields for Germany as of 7th of January 2020. See point 1.  |
| Country Risk Premium      | 1.50% | CRP (over German risk-free rate) for Portugal. See point 2.   |
| Beta ( $\beta$ )          | 0.66  | Monthly adjusted levered Betas for GALP's R&M peers, which were unlevered considering each peers capital structure and effective tax rate. An average of those unlevered betas was, then, leveraged using GALP's 2019 capital structure. See point 4. |
| Market Risk Premium (MRP) | 6.30% | Excess Market Premium for Portugal (Fernandez). See point 3.  |
| Terminal Growth Rate (g)  | 2.00% | Appendix 14   |

| Gas and Power             |       |   |
|---------------------------|-------|---|
| Risk Free Rate (RFR)      | 1.10% | 10Y Government Bond yields for Germany as of 7th of January 2020. See point 1.  |
| Country Risk Premium      | 1.50% | CRP (over German risk-free rate) for Portugal. See point 2.   |
| Beta ( $\beta$ )          | 0.42  | Monthly adjusted levered Betas for GALP's G&P peers, which were unlevered considering each peers capital structure and effective tax rate. An average of those unlevered betas was, then, leveraged using GALP's 2019 capital structure. See point 4. |
| Market Risk Premium (MRP) | 6.30% | Excess Market Premium for Portugal. See point 3.  |
| Terminal Growth Rate (g)  | 2.00% | Appendix 14   |

1. As the benchmark for the **risk-free rate (RFR)** we used the normalized 10Y German Bond Yield, as of 7<sup>th</sup> January 2020.
2. A **country risk premium (CRP)** was added to the risk-free rate in order to account for each country's specific risks. CRP was computed as the difference from Portugal's (or Brazil's) RFR and the German RFR. These rates were retrieved from "Market Risk Premium and Risk-Free Rate used for 69 countries in 2019: a survey" (Fernandez)
3. **Market risk premium (MRP)** is lower for Brazil than for Portugal, reflecting the higher RFR in this country.
4. We decided to compute **Betas** for the company as a whole, as well as for each of the company segments. This way, and using the pure-play method, we were able to better estimate the risk associated to each segment and region. The levered betas of GALP peers presented are the average of 2015-2019 adjusted betas, with monthly data.

|                      | D/E (market values) | Tax Rate |
|----------------------|---------------------|----------|
| Galp Energia SGPS SA | 0.25                | 31.5%    |

| GALP (as a whole)               | Levered Beta     | D/E  | Unlevered Beta |
|---------------------------------|------------------|------|----------------|
| Repsol SA                       | 1.01             | 0.38 | 0.83           |
| OMV AG                          | 1.05             | 0.51 | 0.81           |
| Eni SpA                         | 0.73             | 0.51 | 0.61           |
| Equinor ASA                     | 1.36             | 0.60 | 1.10           |
| MOL Magyar Olajes Gazipari Nyrt | 1.16             | 0.35 | 0.88           |
| Gazprom Neft' PAO               | 0.64             | 0.44 | 0.47           |
| Total SA                        | 0.94             | 0.45 | 0.73           |
|                                 | Weighted Average |      | 0.77           |
| GALP                            | 0.90             |      |                |

| E&P                              | Levered Beta     | D/E  | Unlevered Beta |
|----------------------------------|------------------|------|----------------|
| GeoPark Ltd                      | 0.55             | 3.13 | 0.22           |
| Enauta Participações SA          | 0.92             | 0.09 | 0.86           |
| Petroleo Brasileiro SA Petrobras | 1.36             | 1.18 | 0.79           |
| Petro Rio SA                     | 1.86             | 0.28 | 1.51           |
|                                  | Weighted Average |      | 0.84           |
| GALP                             | 0.99             |      |                |

| R&M                             | Levered Beta     | D/E  | Unlevered Beta |
|---------------------------------|------------------|------|----------------|
| Neste Oyj                       | 0.84             | 0.66 | 0.54           |
| Rubis SCA                       | 0.57             | 0.25 | 0.48           |
| DCC PLC                         | 0.86             | 0.74 | 0.53           |
| Polski Koncern Naftowy Orlen SA | 1.35             | 0.28 | 1.10           |
|                                 | Weighted Average |      | 0.66           |
| GALP                            | 0.77             |      |                |

| G&P                                     | Levered Beta     | D/E  | Unlevered Beta |
|---|------------------|------|----------------|
| Ren Redes Energeticas Nacionais SGPS SA | 0.74             | 1.83 | 0.32           |
| EDP Energias de Portugal SA             | 0.94             | 1.84 | 0.35           |
| Endesa SA                               | 0.58             | 0.67 | 0.38           |
| Iberdrola SA                            | 0.58             | 1.03 | 0.32           |
| Naturgy Energy Group SA                 | 0.72             | 1.52 | 0.33           |
|   | Weighted Average |      | 0.34           |
| GALP                                    | 0.40             |      |                |

### Cost of Debt

Cost of Debt will be the same for all three segments of GALP as the company finances itself in Portugal.

$$\text{Cost of Debt} = \text{RFR} + \text{CRP} + \text{Spread (AAA)}$$

We used the 10-year normalized 10Y German Bond Yield (1.1%) as a proxy for the RFR and added a CRP (1.5%) to account for Portugal specific realities and risks. Finally, we added a spread of 75b.p., reaching a pre-tax cost of debt of 3.35%. Adjusting for taxes, GALP's cost of debt is 2.30%.

GALP is not rated by rating agencies. So, in order to reach the spread over the RFR we estimated a synthetic rating for the company. With a market capitalization over 12 billion euros and an interest coverage ratio of 9.45x, GALP has a synthetic rating AAA correspondent to a spread of 75b.p.

## Appendix 14: Terminal Growth Rate

| E&P Stable Growth Model |             | R&M Stable Growth Model |             | G&P Stable Growth Model |              | GALP Stable Growth Model |             |
|-------------------------|-------------|-------------------------|-------------|-------------------------|--------------|--------------------------|-------------|
| CAPEX                   | 4,709.40    | CAPEX                   | 1,614.98    | CAPEX                   | 163.05       | CAPEX                    | 6,487.43    |
| D&A                     | 3,621.96    | D&A                     | 1,575.37    | D&A                     | 393.31       | D&A                      | 5,590.64    |
| Changes NWC             | 109.50      | Changes NWC             | 526.21      | Changes NWC             | 124.34       | Changes NWC              | 760.05      |
| EBIT                    | 10,244.35   | EBIT                    | 2,968.69    | EBIT                    | 526.42       | EBIT                     | 13,739.46   |
| Tax Rate                | 31.5%       | Tax Rate                | 31.5%       | Tax Rate                | 31.5%        | Tax Rate                 | 31.5%       |
| Reinvestment Rate       | 17.1%       | Reinvestment Rate       | 27.8%       | Reinvestment Rate       | -29.4%       | Reinvestment Rate        | 17.6%       |
| ROE                     | 14.1%       | ROE                     | 14.1%       | ROE                     | 14.1%        | ROE                      | 14.1%       |
| <b>g</b>                | <b>2.4%</b> | <b>g</b>                | <b>3.9%</b> | <b>g</b>                | <b>-4.1%</b> | <b>g</b>                 | <b>2.5%</b> |

| Dividend Sustainable Growth |              | Terminal Growth Rate |      |
|-----------------------------|--------------|----------------------|------|
| Net Income                  | 9,262.98     | <b>E&amp;P</b>       | 2.8% |
| Dividends                   | 6,777.10     | <b>R&amp;M</b>       | 1.7% |
| Sales                       | 191,479.89   | <b>G&amp;P</b>       | 1.7% |
| Total Assets                | 163,380.75   | <b>GALP</b>          | 2.0% |
| Shareholder's Equity        | 52,421.24    |                      |      |
| <b>(NI-D)/NI</b>            | <b>26.8%</b> |                      |      |
| <b>ROE</b>                  | <b>17.7%</b> |                      |      |
| NI/S                        | 4.8%         |                      |      |
| S/A                         | 117.2%       |                      |      |
| A/E                         | 311.7%       |                      |      |
| <b>g</b>                    | <b>4.7%</b>  |                      |      |

In the terminal period we assumed a going concern approach with cash flows growing perpetually at a continuous rate. We followed two approaches to reach the Terminal Growth Rate – Stable Growth Model and Dividend Sustainable Growth. The first one may be applied for each segment individually, while the latter can only be applied to the company as a whole. For the Stable Growth Model, we used the sum of values of 2019-2025F, except for the value for the ROE which was computed as the average between 2015-2025F. In the Dividend Sustainable Growth Model, the values used came from 2015-2025F. In the case of the Stable Growth Model the only value that was immediately rejected came from the G&P. The E&P value was considered too low if we consider the potential growth of the segment, the R&M we considered that it was overly estimated. The value of the GALP as whole was deemed unfit, as it was too high. Thus, we applied the forecasted GDP growth on the R&M and G&P segments based on the strong relationship between the demand of the segments and the GDP growth. For the E&P we applied a premium based on the potential for growth of the segment. In the company as a whole, we based our choice in the values that the segments presented individually.

## Appendix 15: FCF Valuation

Regarding the FCF model, several adjustments were carried out for the transition from Enterprise Value to Equity Value. The adjustments were carried out in order to consider non-operational assets and financial liabilities. Other financial assets were added and Other Financial Instruments were subtracted. The Post-Employment Fund of the company is presented as a liability and will therefore be subtracted. The Provisions (mostly connected to Decommissioning costs and CESE) were subtracted, as they will negatively affect the company's value if they were effectively incurred. Lastly, Non-controlling interests were subtracted.

| FCFF Valuation SOTP         |                |
|-----------------------------|----------------|
| E&P                         | 10 506         |
| R&M                         | 3 022          |
| G&P                         | 1 924          |
| <b>Enterprise Value</b>     | <b>15 451</b>  |
| Mozambique                  | 867            |
| Net Debt                    | -3 695         |
| Other financial assets      | 200            |
| Other financial instruments | -102           |
| Post-employment liabilities | -304           |
| Provisions (including CESE) | -724           |
| Non-controlling interests   | -1 688         |
| <b>Adjustments</b>          | <b>-5 447</b>  |
| <b>Equity Value</b>         | <b>10 004</b>  |
| Shares Outstanding          | 829            |
| <b>Price Target</b>         | <b>12,06 €</b> |

| WACC                          | GALP (whole) | E&P           | R&M          | G&P          |
|-------------------------------|--------------|---------------|--------------|--------------|
| Risk Free Rate (RFR)          | 1.10%        | 1.10%         | 1.10%        | 1.10%        |
| Country Risk Premium (CRP)    | 1.50%        | 6.10%         | 1.50%        | 1.50%        |
| Beta (β)                      | 0.90         | 0.99          | 0.77         | 0.40         |
| Market Risk Premium (MRP)     | 6.50%        | 4.50%         | 6.50%        | 6.50%        |
| <b>Cost of Equity</b>         | <b>8.47%</b> | <b>11.66%</b> | <b>7.64%</b> | <b>5.23%</b> |
| Cost of Debt                  | 3.35%        | 3.35%         | 3.35%        | 3.35%        |
| Effective Tax Rate            | 31.50%       | 31.50%        | 31.50%       | 31.50%       |
| <b>After-tax Cost of Debt</b> | <b>2.30%</b> | <b>2.30%</b>  | <b>2.30%</b> | <b>2.30%</b> |

### GALP (whole)

|                                  | 2020E  | 2021F  | 2022F  | 2023F  | 2024F  | 2025F  | Terminal Value |
|----------------------------------|--------|--------|--------|--------|--------|--------|----------------|
| Weight of equity (Market Values) | 79.93% | 79.15% | 79.20% | 79.27% | 79.17% | 78.99% | 80.00%         |
| Weight of debt (Market Values)   | 20.07% | 20.85% | 20.80% | 20.73% | 20.83% | 21.01% | 20.00%         |
| WACC                             | 7.23%  | 7.21%  | 7.22%  | 7.22%  | 7.22%  | 7.21%  | 7.23%          |

### Exploration & Production

|                                  | 2020E  | 2021F  | 2022F  | 2023F  | 2024F  | 2025F  | Terminal Value |
|----------------------------------|--------|--------|--------|--------|--------|--------|----------------|
| Weight of equity (Market Values) | 79.93% | 79.15% | 79.20% | 79.27% | 79.17% | 78.99% | 80.00%         |
| Weight of debt (Market Values)   | 20.07% | 20.85% | 20.80% | 20.73% | 20.83% | 21.01% | 20.00%         |
| WACC                             | 9.78%  | 9.73%  | 9.73%  | 9.74%  | 9.73%  | 9.72%  | 9.82%          |

### Refining & Marketing

|                                  | 2020E  | 2021F  | 2022F  | 2023F  | 2024F  | 2025F  | Terminal Value |
|----------------------------------|--------|--------|--------|--------|--------|--------|----------------|
| Weight of equity (Market Values) | 79.93% | 79.15% | 79.20% | 79.27% | 79.17% | 78.99% | 80.00%         |
| Weight of debt (Market Values)   | 20.07% | 20.85% | 20.80% | 20.73% | 20.83% | 21.01% | 20.00%         |
| WACC                             | 6.56%  | 6.55%  | 6.55%  | 6.55%  | 6.55%  | 6.55%  | 6.51%          |

### Gas & Power

|                                  | 2020E  | 2021F  | 2022F  | 2023F  | 2024F  | 2025F  | Terminal Value |
|----------------------------------|--------|--------|--------|--------|--------|--------|----------------|
| Weight of equity (Market Values) | 79.93% | 79.15% | 79.20% | 79.27% | 79.17% | 78.99% | 80.00%         |
| Weight of debt (Market Values)   | 20.07% | 20.85% | 20.80% | 20.73% | 20.83% | 21.01% | 20.00%         |
| WACC                             | 4.63%  | 4.64%  | 4.63%  | 4.63%  | 4.63%  | 4.63%  | 4.63%          |

| Exploration & Production               | 2020F    | 2021F     | 2022F    | 2023F    | 2024F    | 2025F    | Terminal Value |
|--|----------|-----------|----------|----------|----------|----------|----------------|
| EBIT                                   | 1 162    | 1 380     | 1 551    | 1 828    | 2 026    | 2 298    | 2 606          |
| Tax Rate                               | 31,50%   | 31,50%    | 31,50%   | 31,50%   | 31,50%   | 31,50%   | 31,50%         |
| SPT&IRP                                | 30,00%   | 30,00%    | 30,00%   | 30,00%   | 30,00%   | 30,00%   | 30,00%         |
| ESEC                                   | 0,0      | 0,0       | 0,0      | 0,0      | 0,0      | 0,0      | 0,0            |
| Unlevered Net Income                   | 557,0    | 661,9     | 743,6    | 876,4    | 971,5    | 1 101,8  | 1 249,6        |
| Non Cash Charges and Other Adjustments | 500,1    | 535,9     | 576,4    | 621,9    | 668,3    | 719,3    | 774,2          |
| D&A, Provisions & Impairments          | 500,1    | 535,9     | 576,4    | 621,9    | 668,3    | 719,3    | 774,2          |
| Changes in Net Working Capital         | -18,0    | -18,7     | -14,5    | -14,6    | -16,1    | -27,6    | -17,6          |
| Capital Expenditures                   | -698,4   | -721,5    | -808,6   | -843,7   | -826,8   | -810,3   | -774,2         |
| Free Cash Flow to the Firm (FCFF)      | 340,7    | 457,7     | 496,8    | 640,0    | 796,8    | 983,2    | 1 232,0        |
| PV of FCFF                             | 2 481,5  | 2 723,0   | 2 485,8  | 2 182,7  | 1 692,9  | 983,2    |                |
| PV of Terminal Value                   | 10 959,1 | 12 025,5  | 13 196,1 | 14 481,2 | 15 890,5 | 17 435,3 |                |
| Enterprise Value                       | 13 440,7 | g = 2.75% |          |          |          |          |                |

| Refining & Marketing                    | 2020F   | 2021F     | 2022F   | 2023F   | 2024F   | 2025F   | Terminal Value |
|---|---------|-----------|---------|---------|---------|---------|----------------|
| EBIT                                    | 324,0   | 486,8     | 592,2   | 499,8   | 487,7   | 578,1   |                |
| Tax Rate                                | 31,5%   | 31,5%     | 31,5%   | 31,5%   | 31,5%   | 31,5%   |                |
| ESEC                                    | -52,5   | -53,1     | -52,0   | -51,9   | -51,9   | -52,4   |                |
| Unlevered Net Income                    | 169,5   | 280,3     | 353,7   | 290,5   | 282,2   | 343,6   |                |
| Non Cash Charges and Other Adjustments  | 258,3   | 269,4     | 268,6   | 256,0   | 255,7   | 267,4   |                |
| D&A, Provisions & Impairments           | 258,3   | 269,4     | 268,6   | 256,0   | 255,7   | 267,4   |                |
| Negative Changes in Net Working Capital | -109,2  | -106,0    | -74,2   | -65,2   | -65,7   | -105,9  |                |
| Capital Expenditures                    | -280,4  | -291,6    | -255,2  | -267,9  | -262,6  | -257,3  |                |
| Free Cash Flow to the Firm (FCFF)       | 38,2    | 152,1     | 292,8   | 213,4   | 209,6   | 247,8   | 252,0          |
| PV of FCFF                              | 920,1   | 980,4     | 882,6   | 628,4   | 442,2   | 247,8   |                |
| PV of Terminal Value                    | 3 811,5 | 4 061,2   | 4 327,2 | 4 610,8 | 4 912,9 | 5 234,6 |                |
| Enterprise Value                        | 4 731,6 | g = 1.70% |         |         |         |         |                |

| Gas & Power                            | 2020F   | 2021F    | 2022F   | 2023F   | 2024F   | 2025F   | Terminal Value |
|--|---------|----------|---------|---------|---------|---------|----------------|
| EBIT                                   | 94,9    | 83,1     | 96,0    | 82,6    | 84,1    | 85,7    |                |
| Tax Rate                               | 31,5%   | 31,5%    | 31,5%   | 31,5%   | 31,5%   | 31,5%   |                |
| ESEC                                   | -12,2   | -11,4    | -12,4   | -12,7   | -12,6   | -12,1   |                |
| Unlevered Net Income                   | 52,8    | 45,6     | 53,4    | 43,9    | 45,0    | 46,6    |                |
| Non Cash Charges and Other Adjustments | 45,1    | 58,6     | 61,6    | 77,6    | 76,0    | 74,5    |                |
| D&A, Provisions & Impairments          | 45,1    | 58,6     | 61,6    | 77,6    | 76,0    | 74,5    |                |
| Changes in Net Working Capital         | -25,5   | -23,2    | -18,2   | -16,2   | -16,3   | -25,0   |                |
| Capital Expenditures                   | -18,7   | -24,3    | -25,5   | -32,2   | -31,5   | -30,9   |                |
| Free Cash Flow to the Firm (FCFF)      | 53,7    | 56,6     | 71,3    | 73,1    | 73,3    | 65,2    | 66,3           |
| PV of FCFF                             | 296,2   | 309,9    | 265,0   | 202,7   | 135,6   | 65,2    |                |
| PV of Terminal Value                   | 1 797,8 | 1 881,0  | 1 968,2 | 2 059,4 | 2 154,8 | 2 254,5 |                |
| Enterprise Value                       | 2 093,9 | g =1.70% |         |         |         |         |                |

#### Appendix 16: FCFE Valuation

The Equity Value in the FCFE was adjusted to discount the non-controlling interests. The net borrowings were equal to the changes in debt in the forecasted year, with adjustments being made in the terminal period. In that period, net borrowings correspond to the amount invested in net CAPEX and NWC that will be financed through debt to maintain the capital structure as 20% D/EV:

$$Net\ Borrowings_{Terminal} = \frac{D}{EV} \times (CAPEX - D\&A + \Delta NWC)$$

| FCFE                                    | 2020F    | 2021F    | 2022F    | 2023F    | 2024F    | 2025F    | Terminal Value |
|---|----------|----------|----------|----------|----------|----------|----------------|
| Net income to common shareholders       | 564.1    | 738.1    | 857.9    | 877.2    | 929.0    | 1,069.8  | 1,091.2        |
| Tax Rate                                | 31.5%    | 31.5%    | 31.5%    | 31.5%    | 31.5%    | 31.5%    |                |
| Non Cash Charges and Other Adjustments  | 803.6    | 863.9    | 906.5    | 955.5    | 1,000.0  | 1,061.2  | 1,082.4        |
| Target D/EV                             | 20.0%    | 20.0%    | 20.0%    | 20.0%    | 20.0%    | 20.0%    | 0.2            |
| Capital Expenditures                    | -997.5   | -1,037.4 | -1,089.3 | -1,143.8 | -1,120.9 | -1,098.5 | -1,120.5       |
| Negative Changes in Net Working Capital | -152.7   | -147.9   | -106.9   | -96.0    | -98.1    | -158.5   | -183.5         |
| Net Borrowing (target D/EV approach)    | 69.3     | 64.3     | 57.9     | 56.9     | 43.8     | 39.2     | 44.3           |
| Free Cash Flow to Equity (FCFE)         | 286.8    | 480.9    | 626.2    | 649.8    | 753.9    | 913.2    | 914.0          |
| PV of FCFE                              | 2,634.5  | 2,858.7  | 2,580.1  | 2,120.1  | 1,595.4  | 913.2    |                |
| PV of Terminal Value                    | 11,118.9 | 12,065.2 | 13,091.7 | 14,205.0 | 15,413.7 | 16,726.8 |                |
| Equity Value                            | 13,753.5 | g = 3.0% |          |          |          |          |                |

| Price per share    |          |
|--------------------|----------|
| Equity Value       | 13,940.9 |
| Shares Outstanding | 829.3    |
| Price per share    | 16.8     |

#### Appendix 17: Dividend Discount Model (DDM)

Regarding the DDM, we applied a two-stage model together with a H-model for the terminal period. In the H-model we considered a short-term growth rate of 8% that reflects the converging dividend growth YoY from 2020F to 2025F. This rate will gradually decrease until it reaches a constant value of 3% in the terminal period from 2029 onwards, which corresponds to the perpetual growth rate for the FCFE. Despite the growing dividends, payout ratio will average 71.4% in the period 2020-2025.

|     | 2020F  | 2021F | 2022F | 2023F | 2024F | 2025F |
|-----|--------|-------|-------|-------|-------|-------|
| EPS | 0.68   | 0.89  | 1.03  | 1.06  | 1.12  | 1.29  |
| YoY | -14.4% | 30.8% | 16.2% | 2.2%  | 5.9%  | 15.2% |
| DPS | 0.77   | 0.84  | 0.88  | 0.93  | 0.97  | 1.02  |
| YoY | 10.0%  | 10.0% | 5.0%  | 5.0%  | 5.0%  | 5.0%  |

| DDM Price Target        |          |
|-------------------------|----------|
| Dividend 2025           | 848.6    |
| H                       | 4        |
| Long-term Growth        | 3.0%     |
| Short-term Growth       | 8.0%     |
| Terminal Cost of Equity | 8.5%     |
| PV Dividends            | 3,015.4  |
| PV Terminal Value       | 11,664.9 |
| Equity Value            | 14,680.3 |
| Shares outstanding      | 829.3    |
| Equity Value per share  | 17.70    |

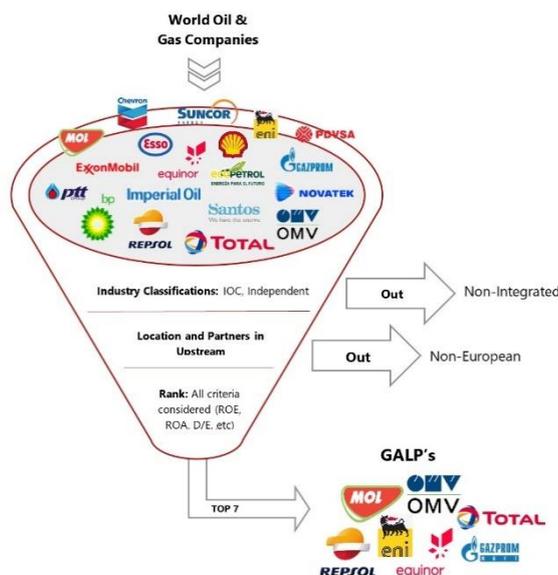
## Appendix 18: Mozambique LNG

Rovuma is currently seen as one of the most promising gas discoveries in the world. Gas has a 10% stake in the project, working together with their partners in the development it. This benchmark project will play a decisive role into GALP's goal of moving into a low carbon strategy.

To properly capture the potential of Rovuma project, we decided to value GALP's stake separately based on recent transactions. There are two transactions we deemed considerable: one from Exxon and one from TOTAL. Exxon acquired a 25% stake in Mozambique's Area 4 (Rovuma LNG and South Coral FLNG) for \$2.8bn. When adjusting for the exchange rate of the period, the acquisition will be valued in €0.6bn per mta. The Total transaction occurred in 2019, with the acquisition of a 26.5% stake in Area 1 (Mozambique LNG) being valued in \$3.9bn. When doing the same adjustment that was previously done to the Exxon transaction, we will achieve a €1.0bn per mta. We then applied an average of the valuation and multiplied it by the GALP's stake in the Rovuma LNG project (1.5 mta). This will return us a value of €1.5/share. We applied an uncertainty factor of 30% over this valuation, since E&P projects always have a certain degree of uncertainty over their economic value. This valuation yielded an additional € 0.90 to the price target.

## Appendix 19: Peers

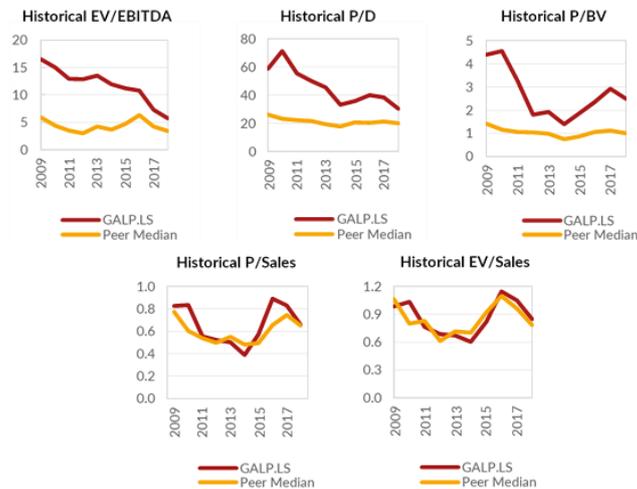
To perform a valuation with multiples, the definition of a peer group is required to more accurately benchmark the relative measures selected. The information related to the peers was taken from Thomson Reuters. The first approach considered was to find peers for each GALP's segment, Upstream and Downstream. For the Upstream, the most appropriate players would be E&P firms from Africa and LATAM, and for the Downstream, European R&M companies. However, due to the lack of comparable companies for the E&P, this approach proved to be ineffective. Since GALP is an IOC with a global presence, we decided to follow another approach where only IOCs were the possible choice for the peer group. Additionally, we narrowed the possible companies by region, only considering European companies or companies operating with GALP in its Upstream projects, either in LATAM or Africa. From the companies we reached with this selection, we eliminated those with extremely higher or lower market capitalization, sales, and assets. As the number of possible companies was still considerably high and in order to reach the peer group as close as possible to GALP's values, a ranking was constructed for a number of financial drivers chosen by our team, including Return on Equity, Return on Assets, EBITDA Margin, Net Debt to EBITDA, etc. The final peer group is represented in the figure below.



Source: Team Analysis

## Appendix 20: Valuation through Multiples

The multiples applied were computed for 2020F. GALP's values were based on team estimates whereas peer multiples were extracted from Reuters' Forecast Multiples. Our team chose to first analyze several GALP's historical multiples to compare with the peers and this way understand GALP's position. GALP is trading at a premium when comparing to its peers mainly because it still has capacity to grow. What we can gather from the evolution of the ratios is that the market seems to be reviewing GALP's growth potential since its ratios are getting closer to the values of the other companies. This may be because the potential of growth of the company is getting smaller, as the company as considerably increased their WIP levels. Nonetheless, the market still seems to be evaluating GALP with a premium over their peers.



Appendix 21: Other information regarding Oil and Gas industry

We should begin by differentiating between an Operationally IOC and a Financially IOC. The first is a company operating in all segments of the Oil & Gas industry and supplying its Downstream with its Upstream production whereas the second, even operating in all segments, the Upstream and Downstream function independently, with oil from the E&P being sold to the open market and the oil for refining also bought from the open market.

**Upstream segment** | Upstream investments occur several years prior to the beginning of production. Consequently, projects undergo several steps until reaching the production phase. The exploration stage initiates when companies acquire the right to explore the areas through a concession deal granted by the country’s government. Exploration is focused on studying the structure of the earth in depth, the geological history of the area and to measure the probability of hydrocarbon occurrence. If the studies confirm economic viability of an oil field, then the first well is drilled, known as “wildcat” well. The Development stage precedes the Production and it is relevant as resources start being accounted as reserves. Finally, Production phase starts as the first marketable hydrocarbons come to the surface. First, the projects go through a ramp-up period. After a given interval of time, which will differ depending on the projects, they reach plateau, meaning they will be producing at full capacity, and then they enter in decline.



Specifically, GALP’s Upstream portfolio comprises around 50 projects, in 6 different locations (Brazil, Angola, Mozambique, Namibia, S. Tomé and Príncipe and East Timor) and in distinct stages of exploration, development, and production.

| GALP’s Locations     | Nb Blocks | In Exploration | In Development | In Production |
|----------------------|-----------|----------------|----------------|---------------|
| Brazil               | 16        | 11             | 2              | 3             |
| Angola               | 3         | -              | -              | 3             |
| Mozambique           | 1         | -              | 1              | -             |
| Namibia              | 2         | 2              | -              | -             |
| S. Tomé and Príncipe | 4         | 4              | -              | -             |
| East Timor           | 1         | 1              | -              | -             |
| <b>Total</b>         | <b>27</b> | <b>18</b>      | <b>3</b>       | <b>6</b>      |

In E&P Brazil, and due to the finding of high potential exploration areas, a new regime was established, meaning that currently 3 types of contracts apply to the pre-salt area. 2 examples are the Concession Contract (CC) and the Production Sharing Contract (PSA). The latter, also the most recently established and only applicable to the pre-salt polygon, occurs when exploration of oil and NG is made through a sharing contract between Petrobras (NOC) and a company or group of companies. The consortium must pay royalties to the government. The obligation of Petrobras acting as the operator and hold a minimum stake of 30% is no longer mandatory, though the company is still given preference. In the concession model, the company or companies within the consortium operate in an area granted by the State. Royalties along with Special Participation taxes must be paid. Special Participation only apply to the projects with high levels of production.

It is relevant to mention that the concession model applies to the projects within the areas contracted prior the establishment of the PSA defined to the pre-salt. In both regimes CNPE decides whether Petrobras is directly hired or if bidding rounds will take place. The participation of external companies is only recently permitted in Brazil. Companies authorized to participate in the auctions will try to get a stake in bidding rounds, where Petrobras continues to be given preference as operator. Companies offering the largest profit to the Brazilian State are the ones winning.

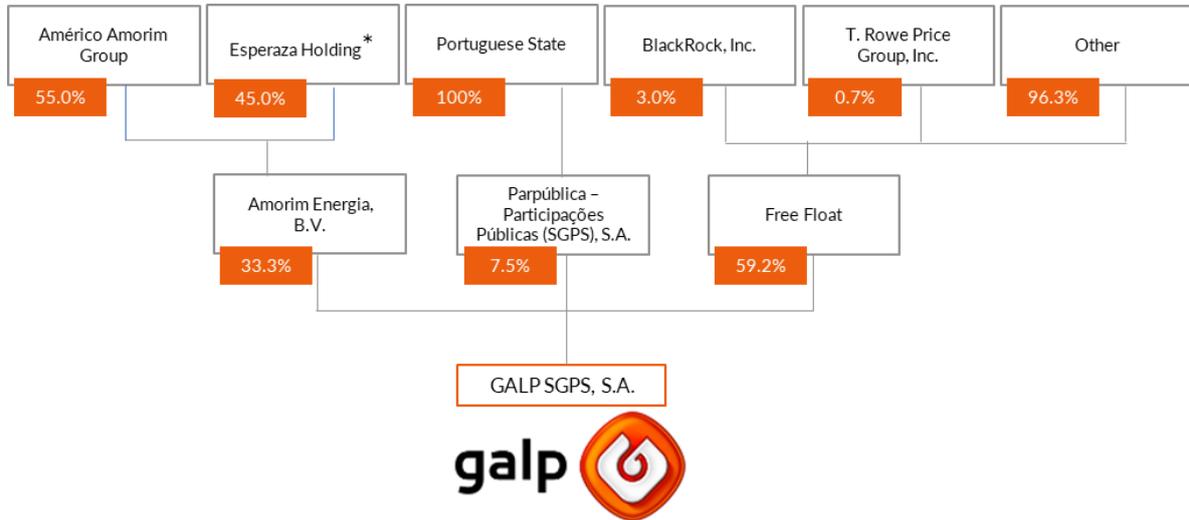
**Midstream segment** | Refers to the processing, transportation and storage of crude oil and NG. Reserves usually are not in the same geographical location as refineries and final consumers. As so, transportation is the main activity and includes using pipelines, rail cars, tanker ships and trucking fleets. Galp does not operate in this segment, since it is a financially IOC.

**Downstream segment** | R&M: A variety of products reach consumers in the marketing phase of this segment. Gasoline, gasoil, heating oil, asphalt, jet fuel, kerosene, NG, LPG, as well as many petrochemicals, are some examples. The major consumers of downstream products are airlines, trucking fleets, utilities and petrochemicals, municipalities, and industrial manufacturers. The companies involved in this segment consist mostly of refineries, natural gas and petroleum distributors, and retail outlets. A key factor that determine the success or failure in this industry is related to how companies can reduce the costs associated with the resource’s purchase and refining process, in order to increase their refining margins.

The refining process is a global, extremely cyclical and margin business, where profitability is very sensitive to marginal changes in oil products supply and demand. The main measure of profitability is the margin, defined as the difference between the price realized for the products to be sold and the cost of the crude delivered to the refinery. Margins tend to diminish when crude prices increase and tend to hold or grow when crude prices drop, because the marketplace adjusts more slowly to lower crude prices than to higher ones. Margins tend to be similar for refineries that operate in the same region and market.

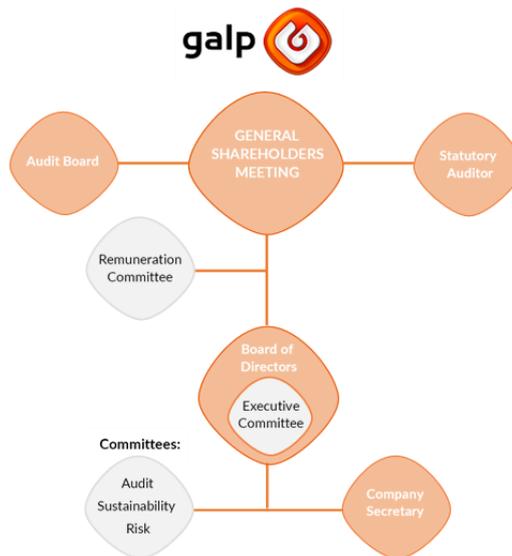
Even though Galp does not possess any refinery in Spain, it still has an extensive distribution network of oil products there. The company currently has a total of 1,460 service stations, maintaining its leadership position in the retail market in Portugal, where it has 710 service stations and 340 convenience stores, out of a total of about 3,000. It is also a relevant player in Spain, since it has over 570 service stations and 380 convenience stores, of a total of around 8,856.

**Appendix 22: Shareholder Structure**



\* Held by Sonangol and Isabel dos Santos

**Appendix 23: Governance Model**



## Appendix 24: Remuneration Policy

As of 31/12/2018

| Director                    | Age | Independent | Position              | Compensation (2018)   | Term |
|-----------------------------|-----|-------------|-----------------------|-----------------------|------|
| Paula Amorim                | 48  | No          | Chairman              | - €                   | 2018 |
| Miguel Athayde Marques      | 64  | Yes         | Vice-Chairman and LID | 84 000,00 €           | 2018 |
| Carlos Gomes da Silva       | 52  | No          | Vice-Chairman         | 1 755 769,00 €        | 2018 |
| Filipe Crisóstomo Silva     | 55  | No          | Member                | 705 000,00 €          | 2018 |
| Thore E. Kristiansen        | 58  | No          | Member                | 920 387,00 €          | 2018 |
| Sérgio Gabrielli de Azevedo | 70  | No          | Member                | 84 000,00 €           | 2018 |
| Abdul Magid Osman           | 75  | Yes         | Member                | 84 000,00 €           | 2018 |
| Marta Amorim                | 47  | No          | Member                | 42 000,00 €           | 2018 |
| Raquel Vunge                | 53  | No          | Member                | 42 000,00 €           | 2018 |
| Carlos Costa Pina           | 49  | No          | Member                | 705 000,00 €          | 2018 |
| Francisco Teixeira Rêgo     | 47  | No          | Member                | 42 000,00 €           | 2018 |
| Jorge Seabra de Freitas     | 59  | No          | Member                | 42 000,00 €           | 2018 |
| José Carlos Silva           | 57  | No          | Member                | 887 082,00 €          | 2018 |
| Pedro Ricardo               | 55  | No          | Member                | 693 083,00 €          | 2018 |
| Tiago Câmara Pestana        | 55  | No          | Member                | 693 083,00 €          | 2018 |
| Rui Paulo Gonçalves         | 52  | No          | Member                | 42 000,00 €           | 2018 |
| Luís Todo Bom               | 71  | Yes         | Member                | 42 000,00 €           | 2018 |
| Diogo Tavares               | 74  | No          | Member                | 42 000,00 €           | 2018 |
| Joaquim Borges Gouveia      | 70  | Yes         | Member                | 42 000,00 €           | 2018 |
| <b>Total</b>                |     |             |                       | <b>6 947 404,00 €</b> |      |

The BoD presented above is the one effective until December 31<sup>st</sup>, 2018. Since it has changed in 2019 and no information has yet been released regarding the remuneration of the new BoD, we decided to present the remunerations of 2018. Below, we present the current constitution of the BoD.

As of 31/12/2018

| Director                | Age | Independent | Position              | Term |
|-------------------------|-----|-------------|-----------------------|------|
| Paula Amorim            | 48  | No          | Chairman              | 2022 |
| Miguel Athayde Marques  | 64  | Yes         | Vice-Chairman and LID | 2022 |
| Carlos Gomes da Silva   | 52  | No          | Vice-Chairman         | 2022 |
| Filipe Crisóstomo Silva | 55  | No          | Member                | 2022 |
| Thore E. Kristiansen    | 58  | No          | Member                | 2022 |
| Carlos Costa Pina       | 49  | No          | Member                | 2022 |
| José Carlos Silva       | 57  | No          | Member                | 2022 |
| Sofia Tenreiro          | 44  | No          | Member                | 2022 |
| Susana Quintana         | 45  | No          | Member                | 2022 |
| Marta Amorim            | 47  | No          | Member                | 2022 |
| Francisco Teixeira Rêgo | 47  | No          | Member                | 2022 |
| Carlos Pinto            | 41  | No          | Member                | 2022 |
| Luís Todo Bom           | 71  | Yes         | Member                | 2022 |
| Jorge Seabra de Freitas | 59  | No          | Member                | 2022 |
| Diogo Tavares           | 74  | No          | Member                | 2022 |
| Rui Paulo Gonçalves     | 52  | No          | Member                | 2022 |
| Edmar de Almeida        | 50  | Yes         | Member                | 2022 |
| Cristina Neves Fonseca  | 31  | Yes         | Member                | 2022 |
| Adolfo Mesquita Nunes   | 42  | Yes         | Member                | 2022 |

| Remuneration                  | Fixed   |               |                                |  |
|-------------------------------|---|---------------|--------------------------------|--|
|                               | Variable<br>(potential maximum of 60% based on the total annual fixed remuneration) | Annual (50%)  | Quantitative Performance (65%) | GALP Value Added (33.3%)   |
|                               |   |               |                                | Total Shareholder Return (TSR) (33.3%)   |
|                               |   |               |                                | EBITDA RC (33.3%)  |
|                               |   | 3-years (50%) | Quantitative Performance (65%) | Total Shareholder Return (TSR) (50%)   |
|                               |   |               |                                | EBITDA RC (50%)  |
| Qualitative Performance (35%) |   |               |                                | Collective performance assessment, including environmental, sustainability and energy efficiency |

## **Appendix 25: Awards**

Throughout the years, GALP has been recognized for its good practices. Below, we present GALP's acknowledgments and awards for 2019 with a brief explanation for each.

Ethibel EXCELLENCE / AAA Rating, by MSCI ESG Ratings / "Prime" Company, by ISS ESG / Top 3 of World's Most Sustainable Companies / "Gold" Company, by EcoVadis / Bloomberg's 2019 Gender-Equality Index / Silver Class Sustainability Yearbook Award 2019

## **Appendix 26: Risk Matrix**

### **Interest Rates (MR4)**

Debt is entirely in EUR, making the company exposed to ECB's monetary policies. Low-interest rates have been beneficial to the company; however, these are expected to eventually increase after 2019. Additionally, most of the debt is raised in Portugal, leaving the company financials also exposed to the Portuguese economy. Historically, the company's average interest rate spread over the long-term government bond yield has been 65 b.p.

### **Political Stability (PRL2)**

Most of the company's Upstream projects are in countries with relevant political and economic risk. Civil disruption, expropriation and nationalization of goods or significant increases in taxes and royalties could all arise from this risk, mostly in Brazil, Angola and, eventually, in Mozambique.

### **Fuel Taxation (PRL3)**

In Portugal, taxes account for c.52% and 43% of the price of gasoline and diesel, respectively. GALP's ability of adaptation to oil price changes is heavily affected by governmental decisions. If these taxes become even more burdensome to the company, it can become an issue for the R&M segment.

### **CESE – Extraordinary Contribution for the Energy Sector (PRL4)**

Following the law and tax regulations, GALP is properly accounted for the legal obligation from CESE, although this obligation is currently subject to legal dispute. The company is accurately provisioned for this and, in a scenario where a payment will be necessary, it should not be a problem in the short run. The decision is in the hands of the Constitutional Court.

### **Amorim Energia (GR1)**

Amorim Energia B.V. position in the shareholder structure (c.33%) gives it a high influence on all shareholders matters (e.g. the ability to block major changes in the company). Although this shareholder has other positive examples where they are the largest holder (like Corticeira Amorim), it is important to understand that their influence is high within GALP, and should they wish to exert that, they are able to. For example, one of the changes that need a qualified majority is the acquisition of the company, and GALP's current structure greatly decreases its desirability as a target, working as a pre-takeover defense mechanism.

### **Dividend Policy Maintenance (FR1)**

The maintenance of a stable dividend policy is part of GALP's strategy. Despite the stability on its core business, in an unexpected event that might lower the cash-flow generation, sustaining the dividends can be difficult. This might be a sensitive topic due to the clientele effect, since some shareholders would not happily accept a dividend decrease or stoppage. Yet, the DPS is expected to remain stable in the period 2019F-2023F.

### **Natural Disasters (ER1)**

Upstream operations are developed in extremely fragile environments (ultra-deep waters), where there is an exposure to the risk of natural disasters. A natural disaster in the Lula-Iracema FPSOs would be disruptive to the operations of GALP, heavily affecting its value creation capacity. It is also important to account for the possibility of environmental damage due to operational failures (e.g. oil spill), that can heavily damage the company's reputation and generate costs associated with damage control.

## **Appendix 27: Porter's Five Forces**

### **-Rivalry Among Existing Competitors**

#### **Upstream | Low (2)**

In this segment, competitors are also partners. This is because most exploration activities operate through production share agreement (PSA) deals. In these, different companies share blocks with different percentages of control, depending on the results of the auction for that specific project. Usually, National Oil Companies (NOC) are the ones awarded with the right of preference to control the blocks. All other players have to go through bidding rounds to gain the interest still available. Brazil's NOC, Petrobras, is the main player of E&P in the country, with c.74% 2018YE of the total oil production. GALP is the 3rd biggest producer in Brazil with c.3% of production, right after Shell with c.13%. As so, companies are both competitors in the auctions, as they are partners in the blocks where they have shares. For these reasons, rivalry among competitors is considered to be low in the Upstream.

#### **Downstream | Significant (4)**

There are 11,860 stations (including service stations and convenience stores) in Portugal and Spain operating in the Marketing segment. GALP has 17% of these. As so, the high number of Downstream competitors turn the rivalry quite significant. Moreover, the homogeneity of the products leads to an increase in competition since companies have the need to differentiate themselves from similar ones.

#### **-Threat of Substitute Products**

##### **Upstream | Insignificant (1)**

With the energy transition, renewable energies and NG will increase its share in the energy mix, with NG becoming the 2<sup>nd</sup> most used source of energy. These can become substitute products for oil. Nonetheless, oil demand will keep increasing in the following years and so is its E&P. For this reason, and as GALP is already producing electricity and NG in the Upstream, intending to increase production in the following years, accompanying the market trends, this force does not represent a threat for GALP.

##### **Downstream | Low (2)**

The same logic is also applied to the Downstream segment, because of the demand of by-products. However, as GALP is already present in the refining and marketing of NG and electricity, the threat of substitute products is low.

#### **-Bargaining Power of Customers**

##### **Upstream | Insignificant (1)**

Consumers are also suppliers. The customers of the Upstream are the downstream players. As so, these do not have almost any bargaining power over the price at which they will buy it.

##### **Downstream | Insignificant (1)**

In the downstream, consumers have small influence on the price since they are highly dependent on the products.

#### **-Bargaining Power of Suppliers**

##### **Upstream | Moderate (3)**

Governments own reserves inside borders, so they have power over exploration rights of their reserves. Frequently, these countries will treat favorably their NOCs, giving them preferred rights and more advantageous conditions in the bidding rounds. Otherwise, political issues may well arise. For this reason, suppliers have some control over which upstream companies get stakes in the blocks.

##### **Downstream | Significant (4)**

GALP buys oil in the market for its refining process. As so, it is exposed to the supplier's influence on the prices. However, as GALP also operates in the Upstream segment and it sells the oil produced in the open market, so it has an influence over prices as a supplier. This creates a natural hedge since the company sells and buys oil in the market, allowing it to adjust the prices in the Upstream segment.

#### **-Threat of New Entrants**

##### **Upstream | Moderate (1)**

New entrants are highly unlikely in the Upstream segment. This is mostly due to the high capital investments required to acquire the basic assets for the E&P. Recently, GALP paid over 106 million euros for a 20% stake for the C-M-791 block located in the Campos Basin in an auction realized in 2018. They already operate in the industry and can afford uncertainty around E&P projects because the current portfolio is sustainable and profitable. However, new players don't have the knowledge to invest in projects that have high uncertainty associated.

##### **Downstream | Significant (3)**

The low costs associated with opening and operating a service station or convenience store make the threat of new entrants much higher than in the Upstream segment. On the other hand, costs needed to build and run a refinery are substantially higher, what lowers the probability of new entrants. Overall, this force represents a significant threat for GALP.

#### **Appendix 28: GALP's VS Oil & Gas Industry ESG Exposure**

##### **Upstream | Environmental Exposure (Industry: 6 | Galp: 5)**

In terms of Upstream's Environmental Exposure, there are two main environmental risks: greenhouse gas emissions and oil spills. Connected to these two types of risks there is also the risk associated with the speed of Energy Transition. All these risks are linked to the production of oil and could heavily affect the value that a company could extract from its E&P operations because of taxes over emissions, liabilities connected to spills or a decrease in prices or demand of oil. GALP seems to be positioned slightly better than its peers, extracting some material advantage over them.

When looking at GALP, we can see that all these risks could impact materially the company, with different degrees of probability and impact. The greenhouse emissions could impact the company, but GALP's decisions seem to indicate that they take it seriously. As stated by the company "This approach has allowed us to achieve an activity carbon intensity of 8.9 kgCO<sub>2e</sub>/boe, considering operated and non-operated assets (WI), better than the benchmarks used by the International Association of Oil and Gas

Production", indicating an upper hand over the industry in terms of greenhouse emission which could help the company in terms of costs from operating its projects.

In terms of Natural Disasters, the company seems to be as exposed to it at a similar degree as the rest of the Industry. The company has a Risk Management Committee which assesses and reviews every year the company's Disaster Recovery Plan. As expected, the company has an insurance program that covers potential disruptive events, such as oil spills. The company seems prepared, but in line with the rest of the industry.

Finally, as with any IOC, GALP is exposed to a possible increase in speed of the upcoming Energy Transition. GALP seems to be well prepared for this transition, with a clear plan for the next decades in order to be a player in this change. The company is present in two of the main drivers for this industry transition: natural gas and renewables. The next big things for the company are the LNG Mozambique projects and the Solar PV project in the Iberian Peninsula. The fact of these projects being heavily linked with the expected Energy Transition is not casual, showing a high degree of preparation from the company and a possible advantage over its peers.

#### **Upstream | Social Exposure (Industry: 5 | Galp: 5)**

The main risk associated Social Exposure are connected to the company's exposure to safety management, social cohesion and consumers behaviour, which may lead to substitution of the company's products. GALP's is as exposed as the rest of the industry.

The safety management is quite connected to the oil spills previously discussed. The company promotes continuous internal and external audits to its assets in order to prevent possible accidents. The company's safety management operations seem to be quite similar to the industry standards, and therefore don't bring a competitive advantage.

Social cohesion is a risk mainly linked to the company's licenses to operate. The company's relationship with the local governments (use of the same language) and communities (Socially Responsible project by GALP Foundation) seems to mitigate this risk, but not enough to be above its peers as most projects are operated through partnerships with them.

Consumers behaviour risk is quite like the Energy Transition risk previously discussed, and the mitigating factors are quite similar. The possibility of consumers changing their preferences to substitute products is mitigated by the fact that the company is investing in said substitute products, such as renewables and natural gas. However, in the Upstream this type of investment will not bring a competitive advantage to the company in terms of demand as the difference of its profitability is still quite significant.

#### **Upstream | Governance Exposure (Industry: n.a. | Galp: 5)**

In the case of Governance Exposure, the S&P prefers to measure it in a company specific basis. However, they specifically say that the Upstream seems to have an above average exposure. This happens as a result of the strong compliance and oversight that is required for the participation in bidding rounds. The presence of government ownership can exacerbate this problem even more. GALP seems to be in an advantageous position as the company do not seem to be interested in further investing in future bidding rounds (there's the belief that its portfolio is strong enough for the needs in the short to medium-term) and has the participation of its local government, through Parública, is non-controlling and isn't expected to increase (there have been talks of it decreasing).

However, the participation from Isabel dos Santos seems to bring public perception problems to the company, even when her participation isn't directly linked to any of the company's major operations. Any possible advantage that the company could extract from its Governance practices seem to be eliminated by Isabel dos Santos' participation in the Amorim Group. There are reasons to believe that an adjustment in the company's cost of capital should be done in order to capture this disadvantage.

#### **Downstream | Environmental Exposure (Industry: 5 | Galp: 5)**

In the Downstream segment, most of the industry exposure stems from greenhouse gas emissions and pollution from the refining process, transport spills, contamination risks and exposure to severe weather. The company does not seem to be in a better position than the rest of industry.

GALP's presence throughout the whole fossil fuel value chain makes them exposed to all of these risks in their Downstream operations. The risks associated with contamination and pollution are mitigated by the existence of retirement obligations, which are already accounted in our valuation. In terms of gas emissions, GALP is actively working in order to cut the amount of emissions derived from their refining process, cutting by 2022 25% of their carbon intensity at the Sines refinery and 15% at the Matosinhos refinery. The work being done in their refineries and the lack of material problems derived from greenhouse gas emissions and pollution seem to indicate that the company is well positioned in this matter, but nothing points to a material advantage over its peers.

The exposure to severe weather doesn't seem to be a material problem, as there is no history of problems related to it in Sines and Matosinhos. However, a material advantage over its competitors isn't expected from it.

#### **Downstream | Social Exposure (Industry: 4 | Galp: 3)**

As with the Upstream, the Downstream Social exposure comes mainly from safety, social and consumer behaviour risks. From our assessment of the company mitigating factors, it seems that GALP is positioned slightly better than the industry in terms of Social Exposure. This will lead to some material advantages that should be considered in our VDA approach.

Safety Management from refining operations is the main indicator in order to see a company's exposure to Safety risks, which in the case of GALP it is done responsibly. As previously mentioned, the company has in place continuous internal and external audits to its assets in order to prevent possible accidents. This resulted in a relatively small number of accidents per year, with none of them resulting in incapacitating injuries. The company clearly states that their goal is to achieve zero personal, material and environmental accidents with a significant impact. All of this points to the conclusion that non-material risks will come from Safety Risks when analyzing this segment.

As with the Upstream, the behaviour risks are mainly coming from the forthcoming Energy Transition. The company's strategy points to acknowledgement of the risk, with the Downstream being well prepared for it. As the leader in the Downstream segment in Portugal, the substitution of oil products for electricity is a real issue and, accordingly, the company has heavily invested in renewable energy (Solar PV

investment) and in building a charging network all over Portugal. The company has an advantage over its peers as its position in the Portuguese market is well ingrained and is being used in order to help in this transition. This work that is being done by the company can also mitigate possible protests that could damage the company's reputation, as GALP is one of the faces of the future Energy Transition.

**Downstream | Governance Exposure (Industry: n.a. | Galp: 5)**

In terms of Governance Exposure, the S&P doesn't disclose any type of special exposure for the Downstream segment. In our assessment of GALP's Governance Exposure over its Downstream segment we think that the company is exposed to the same issue as with the Upstream segment, as the Governance problem derived from Isabel dos Santos' position will affect the company in both segments.

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