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EQUITY RESEARCH – GALP ENERGIA

MANAGING GROWTH AND TRANSITION

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Abstract

This report presents an equity research analysis of Galp Energia, focusing on its strategic balance between growth and energy transition amidst the evolving global energy landscape. The analysis emphasizes the interconnectedness of industry profitability with oil prices, shaped by geopolitical and macroeconomic factors, and the shift toward renewable energy driven by regulatory and consumer trends. Specific attention is given to the valuation of Galp's Commercial and Renewables segments, alongside forecasts for oil product demand, natural gas sales, and renewable electricity generation. Sensitivity analyses highlight the impact of oil price volatility on valuation. The findings underscore Galp's dual challenge of maintaining stakeholder returns while transitioning to a sustainable energy portfolio.

Keywords: Oil and Gas; Galp Energia; Valuation; Equity Research

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This report is part of the *Equity Research – Galp Energia* report (annexed), developed by Miguel da Silva Santos and Gonçalo Manuel Martins de Sousa and should be read has an integral part of it.

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Introduction

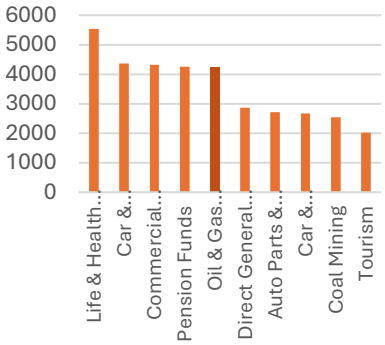
This report represents my contribution to the joint report *Equity Research – Galp Energia,* elaborated as the Work Project to the Master's Degree in Finance.

The report conducts a valuation of Galp Energia, a company in the oil & gas industry. This individual report is divided into Industry Overview, Company Overview, Analysis and Forecasts, Terminal Growth, Sensitivity Analysis and Multiples Valuation. The sections of Company Overview, Analysis and Forecasts and Multiples Valuation contain only the Commercial and Renewables segments, which were my main focuses for the valuation, while my colleague analysed the Upstream and Refining & Midstream for these sections. Additionally, my colleague was responsible for the WACC and Scenario Analysis sections.

The present report emphasizes how the profitability of the industry is connected to oil prices, which are subject to geopolitical shocks, the current macroeconomic context in which Galp operates, and the difficult task of striking the right balance between investing in renewable energies while still delivering high returns to investors and ensuring energy security to clients. The sensitivity analysis shows that the company's valuation is dependent on the evolution of oil prices, which will also influence the success of the exploration of reserves in Namibia

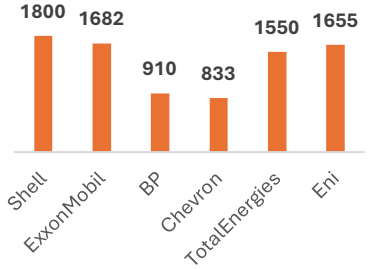
Industry Overview

Figure 1: Industries ranked by revenue, $ billions



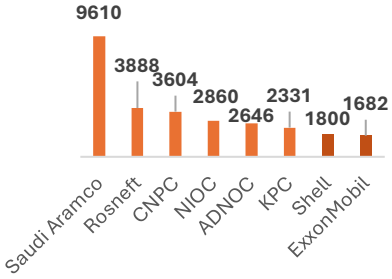
Source: IBIS World

Figure 2: Oil "majors" ranked by annual crude oil production, mbpd



Source: Companies' reports

Figure 3: Oil "majors" and NOCs ranked by annual crude oil production, mbpd



Source: Companies' reports, analysts' estimates

The oil and gas industry is among the world's largest sectors in terms of revenue, estimated to generate around $4.2 trillion in revenue as of 2024 (IBIS World 2024).

Oil and natural gas are major industries in the energy market and play an influential role in the global economy as the world's primary fuel sources, ensuring heating, transportation and manufacturing. The industry is typically divided into three main segments – upstream, midstream and downstream. The upstream is dedicated to exploration and production; midstream companies are dedicated to the transportation and storage of oil and oil products, and downstream companies focus on the refining and marketing of oil products (Library of Congress 2024).

Key Players

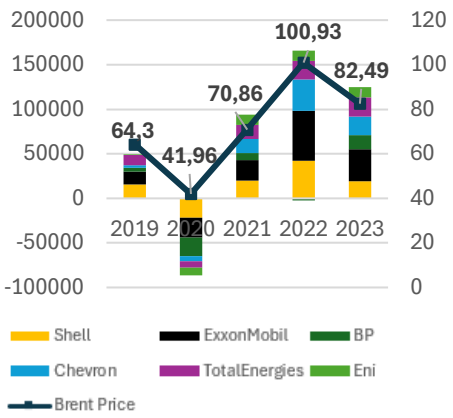
The largest companies in the industry are integrated, meaning that they are involved in each segment of the industry, as is the case of Galp. The six or seven largest publicly traded companies in the sector are commonly known together as the "supermajors" or just "majors", and more broadly along with other large private companies as IOCs (international oil companies) (Library of Congress 2024).

Companies such as ExxonMobil, Chevron, BP and Shell are frequently mentioned as part of the "majors" group. However, there are other several large oil and gas exploration companies which are state-owned, also known as national oil companies (NOCs), which are often opaque in relation to their operating data (Library of Congress 2024). In Saudi Arabia, the company which is given mandates to exploit national resources is Saudi Aramco. Aramco alone represents a larger share of the total oil produced in 2023 than all the "majors" combined. We can see that, ranking by annual production, the industry's biggest players are NOCs.

Market Dynamics

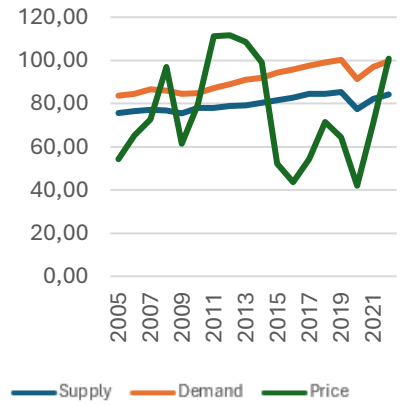
Oil prices are the main determinant of the profits and margins of oil and gas companies. The year 2022 set the record for the largest annual profits the industry has seen, following a recovery from the COVID-19 pandemic and the Russian invasion of Ukraine (IEA 2023). Geopolitical factors and the influence of OPEC are among the most relevant factors shaping oil prices and industry profits and determining investment decisions for industry players. These shocks create uncertainty in future supply and demand, and result in high price volatility. Both supply and demand are very inelastic for price changes in the short term, due to the years it takes to significantly change the production capacity and the difficulty for consumers to change fuel sources in the short term. Under these circumstances, large price swings can be necessary to rebalance supply and

Figure 4: Oil "majors" yearly profits, in $ millions, and average annual brent crude oil price for the year



Source: Companies' reports, Statista

Figure 5: Demand (in orange), supply (in blue), and brent crude oil prices in $ (green). Demand and supply in mboepd.



Source: IEA, OPEC, Statista

demand (EIA 2024).

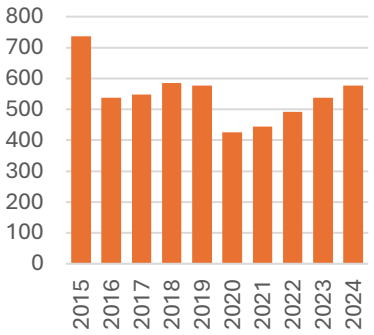
The impact of OPEC in shaping oil prices cannot be ignored. The OPEC was formed in 1960 and has since expanded to 13 members. The member countries are among those that have the largest oil reserves in the world, and the organization meets frequently to set production targets for oil, to help manage global oil prices for the group (EIA 2024). In 2016, OPEC signed an agreement with other 10 oil producing countries, to create the so-called OPEC+, with a notable new member being Russia. Together, OPEC+ countries in 2022 accounted for 59% of the world's oil production (EIA 2024). Between 2016 and 2020, production targets were set among member countries, aiming to keep oil inventories low and lifting crude oil prices up (Quint and Venditti, The influence of OPEC+ on oil prices: a quantitative assessment 2020). The ECB suggests that on average, during this period, OPEC's strategy increased crude oil prices a modest $4 per barrel (Quint and Venditti, The influence of OPEC+ on oil prices: a quantitative assessment 2020). OPEC production announcements also played a role in the oil price surge in 2022 (Qi Zhang 2023).

The impact that geopolitical tensions can have on the sector and on the broader economy could be shown during the Russian-Ukrainian conflict. Following the invasion, Brent crude oil prices rose significantly, surpassing the barrier of 130$ per barrel, the highest since July 2008 (CNBC 2022), and it is estimated that the conflict led to an increase in WTI and Brent crude oil prices of 70.72% and 73.62% respectively (Zhang, et al. 2024). The price increase in oil prices after the outbreak of the war was caused by speculative investor activities, who were predicting a decrease in the global supply of oil, OPEC+ modest production announcements, which kept supply low, and the exacerbation of the already low inventory situation (Qi Zhang 2023). The European ban on oil imports from Russia led to a global shift in energy flows. It forced EU member countries to increase imports from other regions, such as the US, Norway, and Algeria (Euronews 2023). Compared to 2021, US LNG exports to the EU increased by 141% (EIA 2023). Russia, on the other hand, had to strengthen other trading relationships, namely to Asia-Pacific, with crude oil exports to China and India increasing to 70% from a previous 20% (ECB 2023).

Upstream and Downstream Investment Outlook

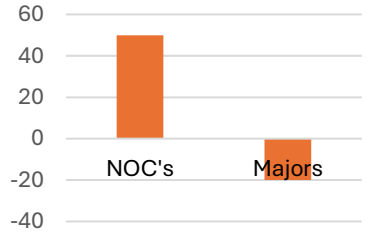
For the upstream segment, investment has increased in 2023 by 9%. In recent years, investment in this segment has mostly been driven by national oil companies of the Middle East and Asian continent. Between 2017 and 2024, investment by Middle East and Asian NOCs has risen by 50%, while investment by IOCs fell by around 20% (IEA 2024). Industry-wide, investment in upstream activities has decreased in the last decade. After oil prices plunged between 2015

Figure 6: Yearly total upstream investment by the O&G industry, $ billions



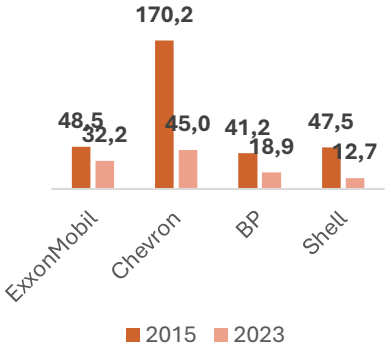
Source: IEA

Figure 7: Change in Upstream investment between 2017 and 2024, NOCs vs Majors, in %



Source: IEA

Figure 8: Upstream capex per barrel of oil produced



Source: Company's reports, own estimates

and 2016, investment rose gradually until 2019, before the COVID-19 pandemic and the resulting lower demand for oil decreased investment yet again. Only in 2024 is investment expected to return to pre-pandemic levels. Apart from Middle East and Asian NOCs, the rest of the industry has kept investment levels low, especially comparing with 2015 (IEA 2024).

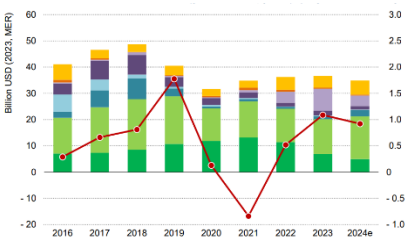
We believe the main reason for this has been the increasing importance of ESG. IOCs have been under internal and external pressure to establish and meet certain climate policies. In 2021, Shell was ordered by a court in the Netherlands to reduce its emissions by 45% by 2030, in a case brought to court by an environmental group (The Guardian 2021). In October the same year, Shell announced an absolute emissions reduction of 50%, by 2030, compared to 2016 (Shell 2021). In 2020, BP announced its net-zero emissions goal for 2050, aiming to reduce its oil and gas production by 40% in 2030, while investing in clean energy (BP 2020). The difference in the level of commitment between majors to the energy transition can be seen on the **Appendix Figure 1**, in which we see both ExxonMobil and Chevron were slower than their peers to commit to Net Zero, and only did so to scope 1 and 2 emissions, not establishing any rigid targets on scope 3, which represents the vast majority of emissions. This difference in commitments can also be illustrated by comparing upstream investments of both companies, where in 2023 we can see a much lower capex on a per barrel basis by BP and Shell compared to ExxonMobil and Chevron, while in 2015 differences between ExxonMobil, BP and Shell were much lower.

Despite the reported investor pressure on the industry, the stock performance for the past 5 years seems to have rewarded ExxonMobil and Chevron's more cautious approach to the energy transition, as seen in **Appendix Figure 2**.

As a result, these companies are rolling back their earlier commitments. BP has reduced its output reduction target from less 40% to only less 25% by 2030 (Reuters 2024). Shell has sold part of its renewable business, and scaled back projects of offshore wind plants, hydrogen and biofuels, including the 200 MW renewable hydrogen production facility in Rotterdam, that would be the largest in Europe if completed (Reuters 2024).

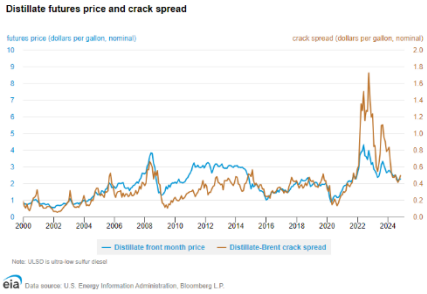
In general, investors seem to be prioritizing near term high returns from the upstream business. For the foreseeable future and taking into account recent shifts in strategy among majors in the industry, it's likely that upstream investment keeps rising, by IOCs and NOCs alike.

Figure 9: Investment in oil refineries by region (greenfield and upgrades), and net refining capacity additions in mb/d (red line). Light green represents China and India, and dark green is Middle East



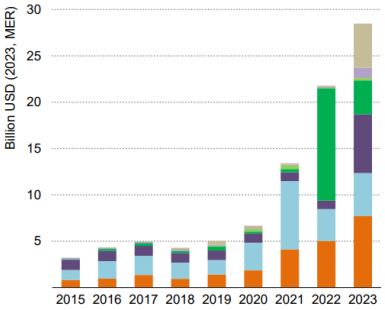
Source: IEA

Figure 10: Distillate futures price and crack spread, blue line and brown line respectively (zoomed in the appendix)



Source: EIA

Figure 11: Oil and gas investment in clean energy.



Source: IEA

In terms of refining investment, most of the 1.3 mb/d net capacity addition in 2023 was driven by China, and the forecasted 0.8 mb/d increase in 2024, with China and India most likely contributing for half of this increase. Despite this, total investment is expected to decrease by 5%. While in 2022 margins were at a record high, in 2023 margins began to decrease (IEA 2024). The figure 10 shows the evolution of the distillate-brent crack spread, which we can see has reverted to the pre-COVID-19 level. (EIA 2024)

The construction of new refineries is capital intensive and characterized by long lead times (ranging between 5 to 10 years), and uncertainties surrounding long-term demand prospects present challenges for investment decisions (IEA 2024). More recently, companies such as PetroIneos and BP have announced the closure of a plant and reducing of processing capacity respectively, citing growing overseas competition, a rise in EV sales, and stricter environmental regulations as reasons (BBC 2024) (Reuters 2024). Therefore, in the future, capacity additions are likely to be in Asia and the Middle East, where demand for oil is forecasted to grow.

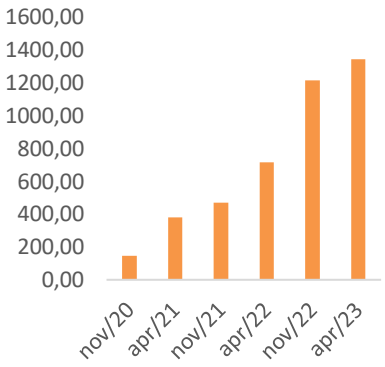
Despite recent change in strategy regarding the aggressiveness of energy transition investment, O&G companies have been ramping up investments in clean energy: the industry invested a total of USD 28 billion into clean energy, which represents a 30% increase from 2022 levels (IEA 2024). In 2022 investment in clean energy grew even more, by 65% more compared to 2021. However, even though investment has been rising, it still represents less than 4% of the industry's total capital investment (IEA 2024).

The recent increase in interest rates has risen the cost of borrowing and the cost of equity, and the resulting higher cost of capital makes it harder to generate attractive risk-adjusted returns, with this fact being especially true for investments like clean energy, which are capital intensive, forcing companies to become more selective in which renewable energy projects to pursue (IEA 2024).

Therefore, it is likely that going forward, transition efforts by O&G companies will be concentrated on improving operational activity and reducing emissions, as well as investing in clean energy technologies that can create synergies, through the leverage of the expertise and already existing infrastructure of O&G players. Low-emissions hydrogen production is one example, since the industry is already a large producer and consumer of hydrogen, used to refine and upgrade oil, and existing infrastructure to store and transport gas are relevant for hydrogen production because of chemical similarities (McKinsey 2023).

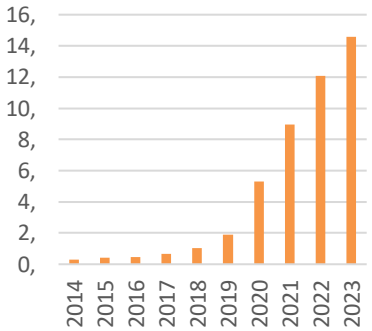
Company Overview

Figure 12: Government spending for clean energy investment support



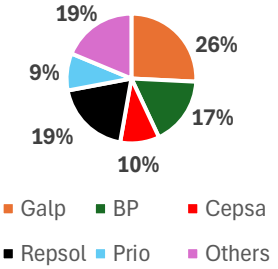
Source: IEA

Figure 13: Share of new zero-emission vehicles in all new vehicles, passenger vehicles, EU27



Source: Eurostat

Figure 14: Market shares of gas stations in Portugal by operator



Source: Marktest, company's reports

As a player in the O&G sector, Galp is vulnerable to all sources of risks that energy markets face, and enters 2023 following a year of major supply chain disruptions and heightened price volatility, caused by the Russian-Ukrainian conflict. Towards the end of 2023, the ECB and the US Federal Reserve announced interest rate hikes, in an effort to curb inflation, adding to the already mounting macroeconomic uncertainties.

Aside from the geopolitical risks affecting oil and gas prices, globally governments have been increasingly incentivizing the energy transition, punishing carbon emissions and subsidizing renewable investments. Consumers are changing their preferences, towards vehicle electrification, and investors are growingly more worried with ESG practices in the companies they have a stake on. On the other hand, the current macroeconomic scenario of tightening interest rates is making investing in renewables more challenging.

It is in this scenario that Galp operates, trying to balance the need to address the global concerns related to climate change and the demand shift towards decarbonisation, as geopolitical risks and regulatory pressures and incentives mount towards renewable energy investments, while at the same time ensuring energy security for their customers and delivering high risk-adjusted returns to the stakeholders.

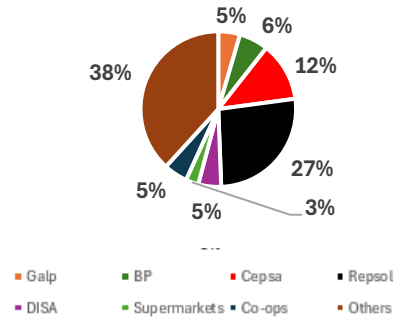
Galp's road to sustainability will have to advance responsibly, considering the still growing demand for fossil fuels and the regional reliance on the Sines refinery as an energy supplier, while trying to reduce emissions and investing in renewables as demand for them grows, and their underlying technology becomes better and cheaper. The decarbonisation commitment made by Galp is thus dependent on the changes in government policies, changes in fossil fuel and green energy demand, and macroeconomic factors affecting access to capital.

- Commercial

The commercial segment of Galp is responsible for the distribution and marketing of refined oil products, natural gas, electricity to end consumers, as well as convenience services and multi energy solutions, such as decentralised solar energy and EV charging points. The company currently operates in Portugal, where it has a leading position, in Spain, where it has an established position, and in Africa, through the stakes in has in 5 companies, in Cape Verde, Guinea Bissau, Angola, Mozambique and Eswatini, a continent in which Galp anticipates strong market growth.

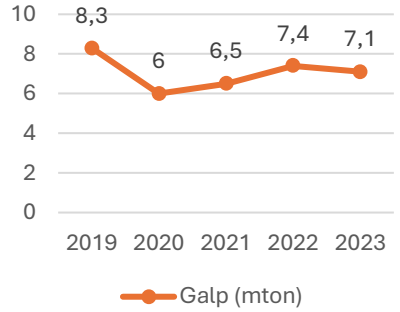
The commercial segment has three other sub-segments, Enterprise, which offers energy solutions to B2B clients, Mobility, which offers energy solutions and retail convenience through Galp's network of 1463 service stations, and Residential,

Figure 15: Market shares of gas stations in Spain by operator



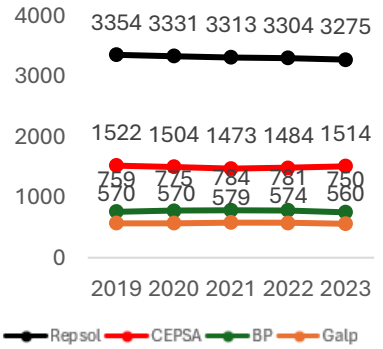
Source: AOP

Figure 16: Amount of oil products sold



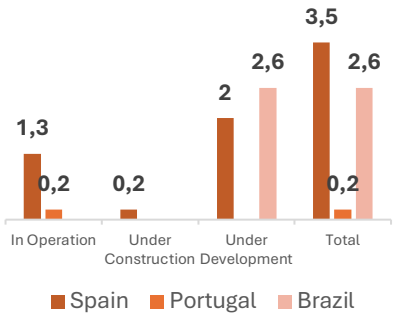
Source: Galp's annual reports

Figure 17: Number of gas station in Spain



Source: AOP

Figure 18: Galp Solar PV portfolio



Source: Galp's annual reports

providing natural gas, electricity and energy efficiency solutions to households. Mobility and Residential are the two B2C sub-segments of the Commercial segments. The B2B segment accounts for most oil product sales, 61% and 62% in 2022 and 2023 respectively, while the B2C segment sales corresponded to 31% and 30%, in 2022 and 2023 respectively, of total sales, with the rest attributable to the international segment (operations in Africa), in both years.

As of 2023, the amount of oil products sold still has not recovered to the level of 2019, prior to the pandemic. From 2020 until 2022 it had increased, mostly due to the recovery in demand. A decrease in demand from the B2B sector in Spain, however, decreased the amount sold again in 2023.

The number of service stations has remained quite stable. Compared to 2019, Galp currently operates two less service stations. In Spain however, one of the main markets of Galp, the trend has not been of stabilization but rather of a gradual decline: the number of service stations operated by the largest operators has been decreasing since 2019.

The need to adapt to changing consumer demand has led Galp to invest in electric mobility charging points, establishing itself as a key player in Iberia. As of 2023, Galp has consolidated an electricity volume share of 17% in Portugal. In 2023, Galp had 4827 points in Iberia, and is targeting 10 thousand by the end of 2025.

Renewables & New Businesses

The Renewables & New Businesses is the most recent unit, started in 2019, and part of Galp's low carbon strategy. This segment is mostly dedicated to the generation of renewable electricity, via solar photovoltaic (PV) panels. Galp's strategy for this segment revolves around establishing a strong presence in its core markets, where the company's integrated value chain can be leveraged to generate synergies, in operational efficiencies and cost reductions.

As of 2023, Galp already has a relevant portfolio and has established itself as one the largest players in solar PV production in Iberia, with plants in operation in both Portugal and Spain. Last year, it produced around 5,92% of all total solar PV energy generation in Portugal and Spain[1]. Other than Iberia, Galp is only present in Brazil, owning projects that are currently under development. As of today, Galp has a total production capacity of 1.4 GW, and it currently has projects in construction and in earlier stages of development in Portugal, Spain and Brazil, totalling 5.5 GW of capacity to be installed. As a result of more added generation capacity, in 2023 Galp increased its renewable energy generation from 1.9 TWh to 2.3TWh. Earlier in 2023, Galp inaugurated a 144 MWp solar PV plant in

[1] According to REN, 7% of the total electricity generated was solar PV (out of 31.2 TWh), and according to REE, 37.322 TWh of solar PV were produced in 2023. Galp's total output was 2,332 TWh, corresponding to the 5,92%.

Alcoutim, Galp's first solar project in Portugal, which is the 4th largest solar plant in operation in the country.

Solar PV investment comes with challenges, however. The recent increase in interest rates has made investing in renewable sources more challenging, due to the capital-intensive nature of investing in solar plants. Furthermore, during this year electricity prices have decreasing compared to 2023, with Galp revealing that prices were 50% lower during the first 9 months of the year, compared to the same period last year in its 3Q report of 2024. As of this year, Galp CEO has admitted that the 4GW of capacity in unlikely to be met, and the target of 12GW of installed capacity for 2030 has been retrieved as well from the latest annual report.

Figure 19: Largest solar plants in Portugal

	Output (MW)
Central Fotovoltaica Riccardo Totta	220
Central Fotovoltaica da Cerca	202
Central Solar Fotovoltaica de Santas	180
Parque Solar de Alcoutim	**144**
Central Solar Fotovoltaica do Cabeço Vermelho	96

Source: OpenInfraMap

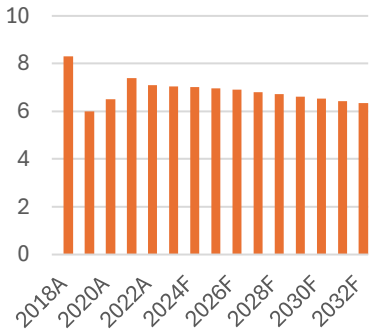
Forecast & Analysis

Commercial

The commercial segment involves the B2B and B2C sale of 3 major categories of products: oil products, natural gas and electricity.

For oil products, the determinant factors for revenues are the amount sold and selling price. To forecast the amount of oil products, we assumed that it would follow the demand growth of oil products in Europe, since Iberia is the prevalent market for this segment. According to the IEA, demand for oil and oil products in Europe should be decreasing until 2029 (IEA 2024). The progressive shift towards EVs as mentioned in the *Company Overview* is one of the reasons, along with lower industrial activity. According to the Eurostat, the EU's production of manufactured goods shrunk by 1.2% in 2023 (Eurostat 2024), and Oxford Economics forecasts that it further decreases by 0.7% in 2024 (Oxford Economics 2024). For reference, in 2022, industry use and road transport together comprised 67% of total oil consumption in the EU (Eurostat 2024). Given this scenario, we will forecast the amount of oil products sold by Galp will decrease at the demand rate forecasted by the IEA.

Figure 20: amount of oil products sold, in mton.

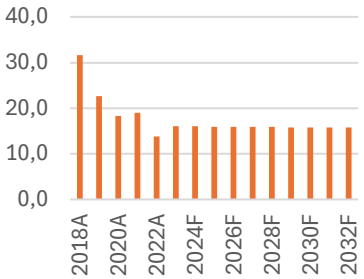


Source: Galp's annual reports, own estimates

To forecast the average price of oil products sold, we assumed that it would grow at the same rate as the evolution of Brent crude oil prices, as forecasted for the upstream segment.

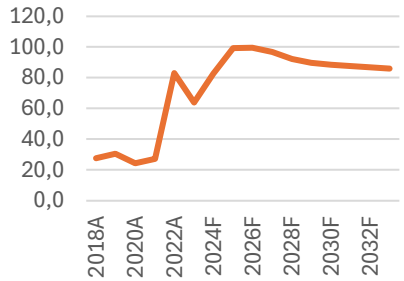
For natural gas revenues, the main drivers we selected were simply the amount sold and price. For the years prior to the forecast, the amount sold can be found for each year in Galp's report, while the reference for an average historical gas price was retrieved from the Eurostat, more specifically the average semestral gas

Figure 21: amount of natural gas sold, in TWh



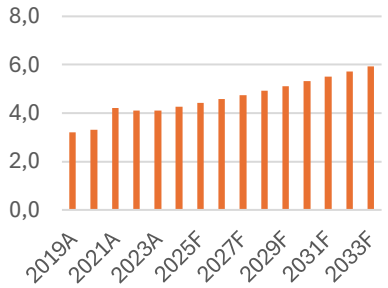
Source: Galp, own estimates

Figure 22: evolution of natural gas prices, per MWh



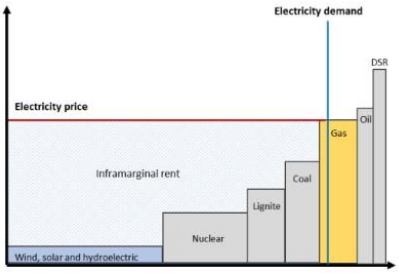
Source: Eurostat, analysts' estimates

Figure 23: amount of electricity sold, in TWh



Source: Galp, analysts' estimates

Figure 24: Simplified merit order supply demand stack



Source: EC JCR

price paid by non-households; we decided for selecting the price paid by non-households since most of the revenues are from the B2B segment. We then just annualized the average gas price paid by non-households in each year by calculating a simple average of the prices in the two semesters of each year.

To forecast the amount of natural gas sold, we decided to look at how consumption of natural gas is set to evolve in the industry and buildings, which are the primary clients of the Commercial segment. Regarding consumption in buildings, the EU is aiming to reduce fossil fuel usage in space and water heating by promoting heat pumps, as part of the RePowerEU plan, aiming to install 10 million additional heat pumps by 2027. Regarding consumption in industry, the IEA forecasts a reduction of 5 bcm in natural gas consumption in advanced economies based on their current policies[27], which represents only around 1.7% of total gas consumption in the EU in 2023[2]. Given this scenario, it seems likely that the amount of natural gas sold by Galp reduces until 2034, but at a very slow rate, which we will assume to be 0,2% each year.

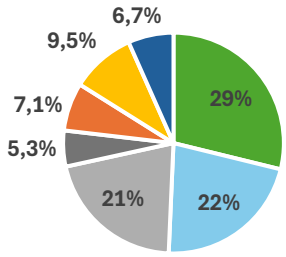
For the prices of natural gas in each year of the forecast period, we started from the price in 2023 and then applied the growth rate implied by the futures prices of Henry Hub natural gas, as mentioned in the upstream forecast.

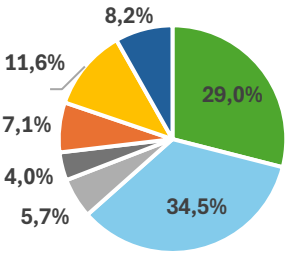
Regarding electricity sales, we distinguish between the transportation electricity sales, via the various charging stations that Galp has in Portugal and Spain, and the electricity sold to households and industries. We will forecast B2B and B2C electricity sales to evolve according to the IEA forecast for the total electricity generation in Europe.

To forecast the electricity price, it is first important to understand how electricity prices are set in the EU. The way electricity prices are set is through a merit order mechanism (Gasparella, Koolen and Zucker 2023). Market sessions take place daily, where demand and supply of electricity are matched for each hour of the following day. In these sessions, producers place offers based on their marginal cost of generating electricity, which are then organized in an ascending order of price, such that bids at a lower price are dispatched first. The equilibrium price that is taken by all producers, regardless of their bid, is the intersection between supply and demand, which corresponds to the marginal cost of the last producer to meet the demand, also known as the market clearing price (Gasparella, Koolen and Zucker 2023). In Iberia, the market is called MIBEL, and the daily auctions are operated by OMIE. Fossil fuel based technologies will have the highest marginal costs, since the bids are driven mostly by the underlying commodity price, while renewable generators tipically have the lowest bids, since variable costs are close

[2] According to Statista, natural gas consumption in the EU in 230 was 319,5 bcm.

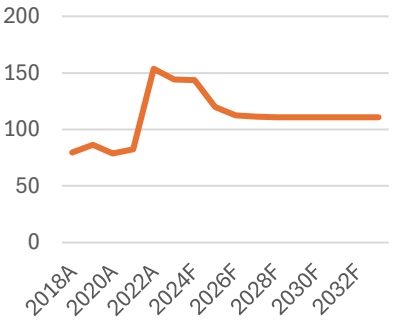
Figure 25: Electricity generation by energy source, first 9 months of 2023 vs 2024 (up and bottom images, respectively





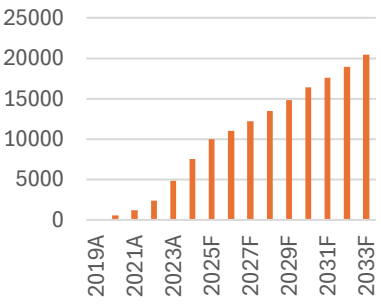
Source: APREN

Figure 26: evolution of electricity prices, per MWh



Source: Eurostat, analysts' estimates

Figure 27: total number of charging points



Source: Galp, analysts' estimates

to zero, as their fuel is zero-cost natural inputs. One consequence of this system, is that often the marginal technology is the combined cycle natural gas plants, which sets the price for the whole electricity market (Gasparella, Koolen and Zucker 2023). A simulation conducted by the Joint Research Centre at the European Commission found that, in 2022, around 90% of the time, the price setting technology in Portugal was natural gas plants, despite only comprising around 40% of the generation mix. This makes it so that the electricity prices in the EU, and especially in the Iberian peninsula, are very strongly connected to the prices of natural gas. Until 2030 and beyond, as renewable capacity is expected to grow, this might put a downward pressure on electricity prices, while the overall expected increase in the demand for electricity might push the prices upward and require the dispatch of natural gas generators. For the first 10 months of 2024, we saw a much larger weight of renewable energy technologies in market closure compared to the same period of last year. In electricity generation, the total share of natural gas reduced from 27% to 6,5%, hydroelectric increased from 30% to 36,5%, and renewables, cogeneration and residues from 27% to 36,9% (APREN 2023) (APREN 2024). The result of this was a much lower average MIBEL price for the period (92,7€/MWh in 2023 vs 52,8€/MWh in 2024, a 43% reduction). While this scenario might be partly due to unusual productivity of renewable technologies during the year, with the expected growth in renewable capacity that is anticipated and that was mentioned in the natural gas forecast, it's likely that lower energy prices become a trend. The market consensus seems to align, as MIBEL electricity futures prices are decreasing to 2034, and the same is true for markets in Italy, Germany and France (APREN 2024). We will, thus, estimate that electricity prices decrease yearly, at the rate implied by the MIBEL electricity futures market.

To estimate revenues from the charging station infrastructure, we selected 3 drivers: the number of EV charging points, the amount of energy supplied per EV charging point, and the average annual price of electricity. According to the latest annual report, Galp wants to target 10k charging points in 2025. Thus, we estimate that Galp installs 2673 more charging points to reach 7500 in 2024 and adds 2500 more to reach 10k in 2025. From 2025 onwards, we estimate that Galp will install charging points in such a way that it maintains the current position of market leadership in Portugal, a target that has been set by the company. A study published by Mobi.E, the authority responsible for overseeing the mobile infrastructure in Portugal, forecasts the amount of charging points necessary until 2050 to ensure growing demand is appropriately matched. To maintain market share, Galp will have to install charging points at a similar rate. The number of charging points forecasted by Mobi.E in 2030 implies a CAGR of 10%, and from

2030 to 2035, a CAGR of 9%[3]. We will estimate the total number of charging points installed by Galp to grow at these rates, until 2033.

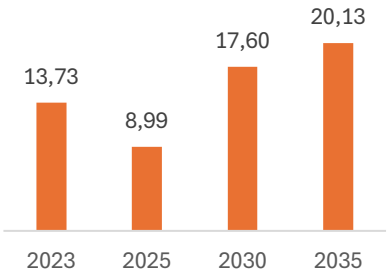
To forecast the average revenue per EV charging point, we considered that this metric would be mostly dependent on the number of BEV/PHEV cars in circulation compared to the number of charging points available. A forecast published by DGEG, provides conservative and optimistic scenarios for future evolution of the freight of electric vehicles in circulation in Portugal[4]. We used this forecast to calculate a ratio of electric vehicles in circulation per charging point, combining the data provided by conservative scenario DGEG and Mobi.E. Finally, we calculated a CAGR of this ratio and assumed that revenues per charging point would increase at that rate.

The capex investment in this segment will be mostly connected to convenience store renovations and EV charging point installations. In the last two annual reports, commercial capex reached c. 113m€ and c.111m€ in 2022 and 2023 respectively, with "business transformation" cited as the main driver for the investment, as the company looks to maintain a strong position in Iberia. According to Galp's last annual report, the company is trying to adapt its product offering to meet emerging demand trends, towards innovation and digitization, focusing on convenience and non-fuel offerings.

Aside from the convenience store renovations, the company will be investing in EV charging points. According to the MOBI.E forecast on the needed investment and charging points installation in Portugal to 2050, the average cost of a charging points installation in 20 thousand euros. To estimate the CapEx related to this invested, we multiplied this amount by the number of charging stations to be installed in each year.

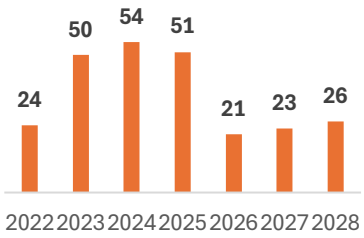
To forecast total Capex for the segment, in 2022 and 2023 we subtracted from the total capex the value that we estimated to be the cost of installing the charging points, according to the previously mentioned method. The leftover amount in each year we assumed to be expenditures related to the renewal of convenience stores. We averaged those values and assumed that it would be the investment in the renewal of convenience stores until 2028, at 75 million a year. From 2029 onwards, we assumed that PP&E would be calculated as a percentage of revenues.

Figure 28: ratio of BEV/PHEV cars in circulation to the total number of installed charging points in Portugal



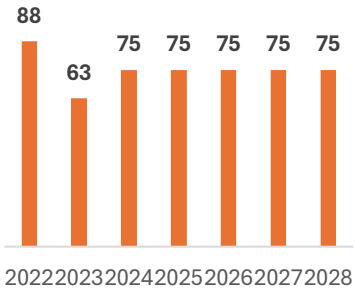
Source: MOBI.E, DGEG, analysts' estimates

Figure 29: investment in charging points, in million €



Source: analysts' estimates

Figure 30: investment in convenience store renovations, in



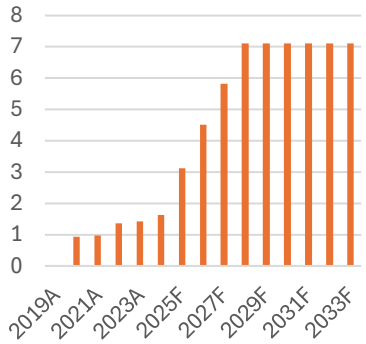
Source: analysts' estimates

Renewables & New Business

[3] According to MOBI.E, there were 10492 charging points in Portugal, as of December of 2024. The study forecasts 31972 charging points installed in 2030 and 46222 in 2035. A link to the study is provided in the references section.
[4] DGEG, "Relatório de Monitorização da Segurança de Abastecimento do Sistema Elétrico Nacional para o período de 2024-2040 (RMSA-E 2023)".

For valuation, we decided to forecast revenues using 3 main value drivers: total installed capacity, the capacity factor, and the electricity price. In the 2021 annual report, Galp targeted a generation capacity of 12 GW in 2030. Most recently, that target seems to have been retrieved, since it is not mentioned in the earliest reports. Galp also had a target of 4GW of capacity to be installed by 2025, which the company has already stated is "unlikely" to be met, citing the current high-interest rate environment and high costs as reasons for the slowed investment and imparity of some projects in Brazil, as well as delays in licensing, that have been slowing the beginning of operation of projects in Spain. We will still forecast a strong growth in production capacity, as currently Galp holds around 200 MW in construction Spain and another total of 5.5 GW of capacity currently under development. For 2024, the company is expecting 200 MW of capacity to be added. We will, therefore, assume no target for 2030, and assume that the 5,5GW that are in development will progressively enter in operation from 2025 to 2028. From 2029 onwards, we assume no further capacity additions.

Figure 31: total solar PV capacity installed, in GW



Source: Galp, analysts' estimates

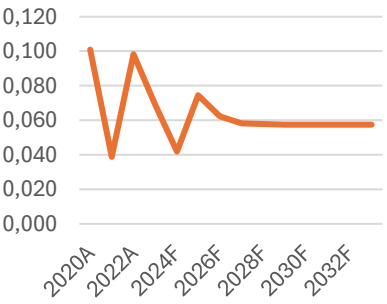
Figure 32: estimated capacity factor by region, 2023

Region	Installed capacity (MW)	Capacity factor
Castile la Mancha	426	18%
Aragon	837	19%
Algarve	144	18%
Coimbra (wind)	12	31%
Total	**1419**	**19%**

Source: PVGIS, renewables.ninja, analysts' estimates

Forecasting the average capacity factor is complex, as this metric is going to depend on the timing of the deployment of new solar plants, as well as weather conditions, concerning solar irradiation, temperature, cloudiness, as well as the underlying technology of the solar panels themselves. We estimated the average capacity factor for 2024 based on the current projects in operation of Galp. For Solar PV plants, Galp currently operates in the regions of Aragon, Castile La Mancha, and Algarve, and each of these regions have particular weather conditions that result in a particular capacity factor. Using the PVGIS database, we calculated the annual electricity output based on the installed capacity in each of the regions, and with that data we calculated the capacity factor for each region.

Figure 33: evolution of electricity price (€millions/GWh)

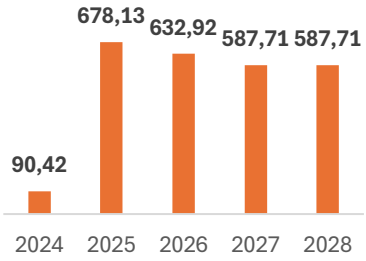


Source: OMIE, analysts' estimates

Regarding electricity price, we will assume a forecast similar to the one conducted for the commercial segment. The latest quarterly report of Galp has reported a large decrease in the realised sale price for electricity from the PV plants, (79€/MWh vs 38 €/MWh, a 52% decrease) citing a higher penetration of hydro generation during the first half of the year as the cause, which is one of the causes for the lower average MIBEL price we analysed in the commercial section of the forecast. We will assume that Galp will end the year with an average realised price of 42€/MWh, implying that we expect a smaller penetration of renewable energy sources during the last quarter of the year, increasing the average price. From 2025 onwards, we assumed that electricity prices would equal those of the MIBEL futures.

Capex investment in renewables is intrinsically linked to the increases in renewable capacity that the company holds. Last year, the company inaugurated the first solar project of the company in Portugal, with a capacity of 144MWp, on an investment

Figure 34: evolution of CapEx, in million €



Source: analysts' estimates

that amounted to over 70 million euros. Using this project as a reference for the necessary capex per MW of capacity installed, we will calculate each year's capex according to the amount of capacity we expect Galp to add each year. Given that part of the CapEx is spent on development on the so-called "soft costs", the capex each year that is associated with the capacity additions is discounting the soft costs that we assume have been incurred prior to the forecast. According to IRENA, soft costs in solar PV installations in Portugal and Spain amount to 7% (IRENA 2024). From 2029 onwards there are no further capacity increases, and kept capex at the level of depreciation, due to the low RONICs connected to further capacity increases. A more extensive discussion on this is on the *Terminal Growth* section.

Terminal Growth

As part of our valuation of Galp, we computed the terminal value of the business segments of Galp, beyond the explicit forecast period from 2024 to 2033. We left the Upstream segment out of this analysis, since for that segment we had a different approach, extending the explicit period beyond 2033 and estimating the production yielded by the several upstream projects until 2056, when we believe the production ceases, as the last projects reach the end of their respective declining phases.

Figure 35: FCF growth in the last three years of the explicit period, R&M

	2031	2032	2033
FCF growth	-2,0%	-1,9%	-1,8%

Figure 36: perpetuity formula inputs and resulting terminal value, R&M

g	-1,8%
WACC	4,99%
FCF 2034	88,435
Terminal Value	**1298,69**

Source: own estimates

To compute the terminal value of the Refining & Midstream segment we used a perpetuity formula. To apply the formula, we estimate the UFCF growth rate "g" to be equal to -1,8%, which is the growth of the UFCF on last year of the explicit period. The negative growth rate is representative of the declining trajectory of the industry, which revenues are dependent on the prices of oil, that are set to decrease over time as demand slows down as countries move away from fossil fuel usage and transportation becomes increasingly electrified. The numerator of the perpetuity formula was simply the FCF of 2034, computed as the FCF of 2033 growing at rate "g".

Figure 37: FCF growth in the last three years of the explicit period, Commercial

	2031	2032	2033
FCF growth	-1,9%	-1,9%	-1,9%

Source: own estimates

The terminal value calculation for the Commercial segment followed the same logic as the R&M segment, where we also applied the same perpetuity formula. In this case, the "g" was -1,9%, the growth rate of the UFCF on the last year of the explicit period forecast, which had during those three years always rounded to -1,9%.

Figure 38: perpetuity formula inputs and resulting terminal value, Commercial

g	-0,25%
WACC	5,41%
FCF 2034	131,9
Terminal Value	**2329,65**

Source: own estimates

Reasons for the negative growth are the similar to those of the R&M segment, since revenues are mostly dependent on the sales of oil products, even though the effect of decreasing revenues from oil and natural gas are offset by the increasing sales of electricity. The NOPLAT of 2034 was computed similarly to the R&M case.

For the Renewables segment the same analysis was conducted, with the "g" equal

Figure 39: FCF growth in the last three years of the explicit period, Renewables

	2031	2032	2033
RR	-0,25%	-0,25%	-0,25%
FCF Growth	-0,24%	-0,25%	-0,25%

Source: own estimates

Figure 40: perpetuity formula inputs and resulting terminal value, Renewables

g	-0,25%
WACC	5,41%
FCF 2034	131,9
Terminal Value	**2329,65**

Source: own estimates

Figure 41: impact of oil price evolution and the recovery rate of Namibia on the share price

Namibia recovery rate \ Oil price growth after 2030	-2%	-1,50%	-1%	-0,50%	0%
30%	32,63	32,72	32,81	32,91	33,00
25%	29,90	29,98	30,06	30,14	30,22
20%	27,18	27,24	27,31	27,38	27,44
15%	24,45	24,51	24,56	24,61	24,67
10%	21,73	21,77	21,81	21,85	21,89

Source: analysts' estimates

Figure 42: impact of the change in refining margins on share price

Refining margin	
3	27,24
4	27,27
5	**27,31**
6	27,35
7	27,39
8	27,43
9	27,46

Source: analysts' estimates

to -0,25%, the last rate of UFCF growth for the segment. After keeping installed capacity constant after 2029, the declining rate of electricity prices brings the overall growth rate of UFCF to slightly negative levels. The weak observed RONICs when we assumed small increases in capacity after 2028, led us to conclude that to keep investing, at that price point of electricity and capacity factor, would be value destructive, since the RONIC was below the WACC. Therefore, we assumed no further capacity increases, and that perpetually the evolution of the FCF should progress at the level observed for the last 3 years of the explicit period, which has stabilized.

Sensitivity Analysis

The valuation of Galp is driven mostly by the upstream segment, which performance is dependent on the prices of oil. Moreover, the recent discovery of oil in the Mopane field of the Orange basin in Namibia has the potential to increase the valuation of Galp significantly as production starts, but will depend on the future recovery rates. Therefore, we analysed how the evolution of oil prices post 2030 and the recovery rate of oil in Namibia affect Galp's share price, ranging the recovery rates between 10% and 30%, to reflect historical variations of recovery rates of Galp's old projects, while also varying the range of the forecasted pace of the decline in oil prices after 2030. We can see on the table that the valuation is quite susceptible to changes in these assumptions. Even inside the narrower interval between 15% and 25% of recovery rate and -1,5% and -0,5% of oil price growth, we can see that the possible share prices vary between 24,51€ and 30,14€

For the Refining & Midstream segment, we conducted a sensitivity analysis on the possible future margins. While they should decrease with oil prices over the forecast period, the baseline value from which they start to decline, from 2025 onwards, is subject to a lot of uncertainty, and there is the possibility of future geopolitical instabilities further increasing these margins. As such, we ranged the refining margins between 3 and 9 €/boe. The margins were around 3€/boe in 2021, when the economy was recovering from the pandemic, and reached above 10 in 2022 with the war in Ukraine raising energy prices. Therefore, our selected range covers, at least historically, a wide range of possibilities concerning future shocks to refining margins. Despite this, future margins do not seem to impact Galp's share price significantly, only increasing the price by around 15 cents when we assume a margin of 9€/boe.

We also decided to conduct a sensitivity analysis on the estimated growth rates of both the commercial and refining and midstream segments, as there is uncertainty regarding the future path of cash flow growth. We kept the range between negative numbers, because they both represent declining industries, so future negative

Figure 43: impact of the perpetual growth rates of the Commercial and R&M segments on share price

g commercial \ g midstream	-0,81%	-1,31%	-1,81%	-2,31%	-2,81%
-0,92%	27,75	27,67	27,59	27,53	27,47
-1,42%	27,60	27,52	27,44	27,38	27,32
-1,92%	27,47	27,39	27,31	27,25	27,19
-2,42%	27,36	27,27	27,20	27,14	27,08
-2,92%	27,26	27,18	27,10	27,04	26,98

Source: analysts' estimates

cash flow growth rates should be the norm in perpetuity. We see that there is only a small 44 cent increase in the share price when both rates approach -0.81% and -0.92%, in the most optimistic scenario, and a 33 cent decrease in the share price when both rates approach -3%. For a wide range of possible different values of g, we observe that the valuation does not change significantly.

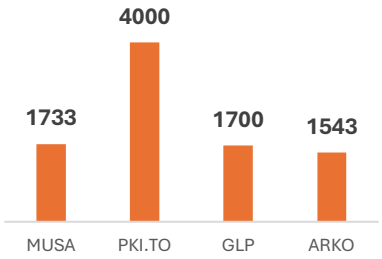
Multiples Analysis

Due to the different nature of Galp's business units, we decided to conduct a multiple valuation for each segment. Each segment was evaluated independently, by choosing companies with similar characteristics and, by summing each individual segment's value, we get Galp's Enterprise Value.

Commercial

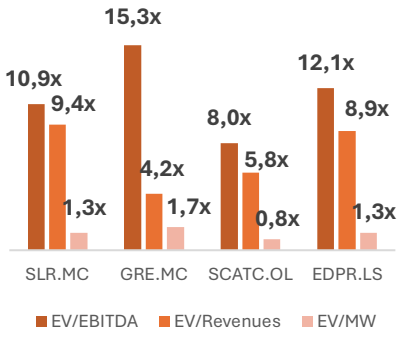
To evaluate the commercial segment, we selected 4 companies with its core business being the operation of convenience stores and gas stations, as well as fuel wholesale. We selected Arko, Global Partners LP, Parkland Corp. and Murphy USA. All of these are North American companies, since we could not find European companies whose core operations were this business line specifically. Dimension-wise, besides Arko, others have significantly higher revenues, despite operating a similar number of retail locations. Even though we are aware of these differences in size and geography, these are still good comparable companies in the sense that they share the same business line, characterized by high volume and low margins, facing similar future risks regarding oil price and demand.

Figure 44: Total number of gas stations by company



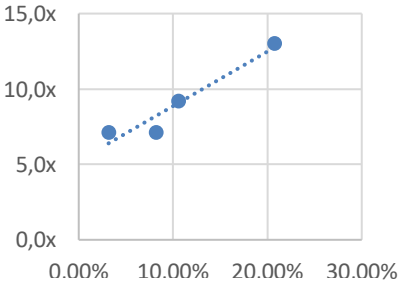
Source: Companies' reports

Figure 45: Company multiples, Commercial



Source: Refinitiv

Figure 46: EV/EBITDA vs ROIC

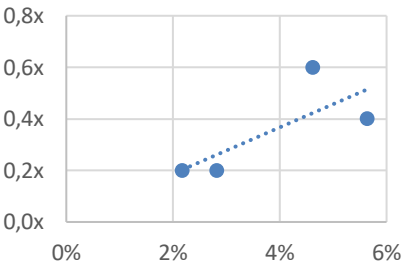


Source: Refinitiv, Bloomberg

The driver of EV/EBITDA that we considered was the most relevant for this segment was the ROIC, as higher profitability should drive this multiple higher, as it increases confidence regarding future growth and indicates efficiency in turning revenues into profits. We can see that in our sample that relationship holds: Murphy USA has a much higher EV/EBITDA multiple than its counterparties at 13x and a much higher ROIC at 21% in 2023. Global Partners has a ROIC of 11% and a multiple 9.2x. However, Arko has a ROIC of 3% and a multiple of 7.1x. The low ROIC of Arko comes from its convenience stores, which have shown major decreases in revenues because of consumer inflation. Recent news regarding intentions to sell this business have increased share price by 14%, explaining the high multiple despite the low ROIC.

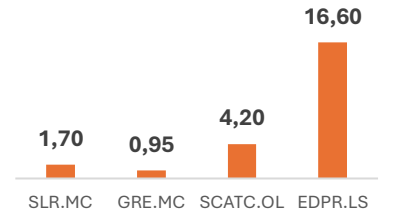
For the EV/Sales multiple, in our sample, we identified that companies with higher EBITDA margins also have higher EV/Revenues multiples. Arko and Global Partners have smaller margins of 3% and 2% respectively and multiples of 0.2x, while Parkland and MUSA have margins of 6% and 5% and multiples of 0.4x and 0.6x, respectively.

Figure 47: EV/Revenues vs EBITDA



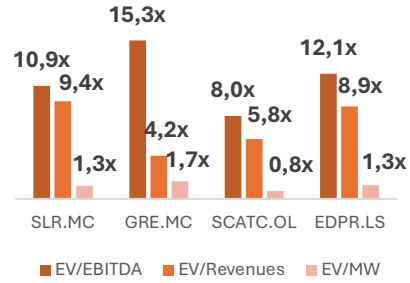
Source: Refinitiv

Figure 48: Total installed capacity, in GW



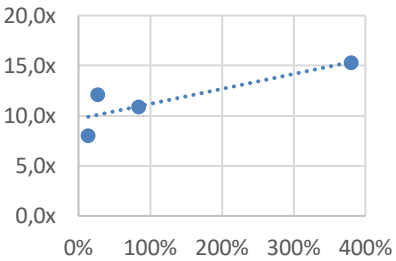
Source: Companies' reports

Figure 49: Company multiples,



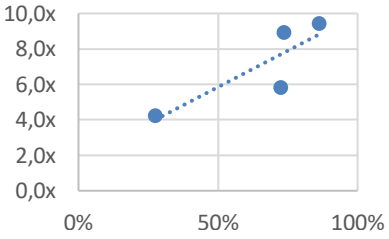
Source: Refinitiv

Figure 50: EV/EBITDA vs Under construction/Installed capacity



Source: Refinitiv, companies' reports

Figure 51: EV/Revenues vs EBITDA Margin



Source: Refinitiv

We also calculated an EV/Gas Stations multiple, resulting in an implied EV in line with the ones given by EV/EBITDA and EV/Sales. We excluded Murphy USA from the valuation using this particular multiple, which has a very high value driven by its high profitability, as it would probably overstate the value of Galp's commercial segment.

Renewables & New Business

To evaluate the renewables segment, we selected 4 companies with renewable electric energy generation from large utility scale solar and wind plants as a core business. Among the chosen, Solaria, EDPR and Grenergy have operations in Iberia, while Scatec does not. Geography matters in this case due to differences in electricity prices in different regions, with Iberia recording lower electricity prices during this year due to higher presence of renewables in the generation mix. We still decided to include Scatec, as they are an independent power producer (IPP) primarily of solar energy like this Galp segment, thus facing the same risks and with similar cash flow structures. Including only IPPs operating in Iberia would be too restrictive and would force us to choose companies with different segments beyond renewable electricity production. Solaria and Grenergy have similar installed capacity in comparison, while EDPR has significantly higher.

Regarding the EV/EBITDA ratio, we considered the projects in construction as a proxy for potential growth of the company, which in turn drives the EV/EBITDA multiple. In theory, companies with better growing opportunities should trade at higher EV/EBITDA multiples, and companies with better opportunities should be constructing proportionally more to capitalize on those opportunities. We can see that Grenergy has the highest EV/EBITDA multiple at 15.8x, while Scatec trades at 8x. Comparing the ratio for *capacity under construction / installed capacity*, this ratio is 13% for Scatec and 380% for Grenergy. For the EV/MW ratio, a sector specific multiple we created in which MW is the capacity installed in MW, the same driver and analysis applies, with Grenergy having the highest value of this multiple at 1.71x and Scatec the lowest at 0.8x

We considered that the most relevant driver of the EV/Sales multiple to be the EBITDA margin, as the higher the margins, the higher each dollar of sales contributes to the profitability of the company and thus higher margins should translate into a higher revenue multiple. Grenergy has the lowest EV/Sales multiple at 4.2x and a EBITDA margin of 27%, while EDPR and Solaria have the highest multiples at 8.9x and 9.4x with margins of 74% and 86%, respectively.

GALP ENERGIA

COMPANY REPORT

OIL & GAS

17 OCTOBER 2024

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Oil dependency against the energy shift

Slow steps toward a new era

- Strong growth in the Upstream segment, with the Bacalhau project coming online in 2025, and expected to increase working interest production by 40kboepd, as well as the important discovery in Namibia of 10 billion hydrocarbons in place, counter-balancing the forecasted decrease in Brent crude prices going forward.
- The Industrial & Midstream segment is forecasted to decline in revenues for the length of our forecast, after 2024, with the decrease in Brent crude prices as well as shrinking refining margins, reflecting a more balanced supply and demand environment.
- The Commercial segment is also forecasted to decline in revenues as oil product sales diminish, with electricity sales forecasted to grow as the company installs more EV charging stations.
- The total renewable capacity of Galp is forecasted to grow strongly until 2028, increasing to a capacity of 7.1 GW in 2028 from 1.4 in 2023. However, further capacity additions could be constrained due to lower electricity prices decreasing returns.
- The sensitivity analysis shows that the valuation is highly dependent on the future oil prices, with the pace of the energy transition being a source of risk for the company and a key determinant of the company's value.

Company description

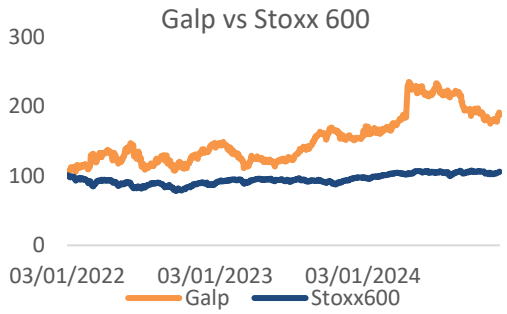
Galp Energia, SGPS, S.A. is a Portuguese multinational energy company based in Lisbon, Portugal. The corporation encompasses over 100 subsidiaries involved in various sectors of the energy industry, including oil and natural gas supply, hydrocarbon exploration and production, refining, trading, logistics, retail, cogeneration, and renewable energy.

Recommendation:	**BUY**
Price Target FY25:	**27.31 €**
Price (as of 17-dez-24)	**17.00 €**

Reuters: GALP.LS, Bloomberg: GALP.PL

52-week range (€)	13.28 - 21.41
Market Cap (€m)	11740
Outstanding Shares (m)	753

Source: Google Finance



Source: Yahoo Finance

(Values in € millions)	2022	2023E	2024F
Revenues	26839	20768	21268
EBITDA	4746	3753	3768
Net Profit	1562	1381	1369
EPS	1.81	1.56	1.82
P/E	7.15	6.55	9.35

Source: Galp annual report, own estimates

THIS REPORT WAS PREPARED EXCLUSIVELY FOR ACADEMIC PURPOSES BY MIGUEL SANTOS & GONÇALO SOUSA, MASTER IN FINANCE STUDENTS OF THE NOVA SCHOOL OF BUSINESS AND ECONOMICS. THE REPORT WAS SUPERVISED BY A NOVA SBE FACULTY MEMBER, ACTING IN A MERE ACADEMIC CAPACITY, WHO REVIEWED THE VALUATION METHODOLOGY AND THE FINANCIAL MODEL. (PLEASE REFER TO THE DISCLOSURES AND DISCLAIMERS AT END OF THE DOCUMENT)

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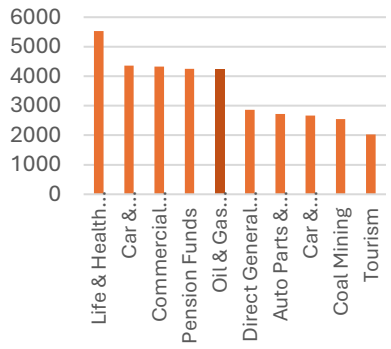
APPENDIX 35

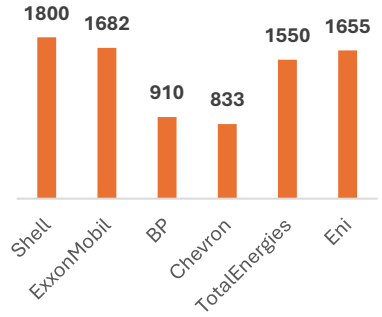
Industry Overview

Figure 1: Industries ranked by revenue, $ billions



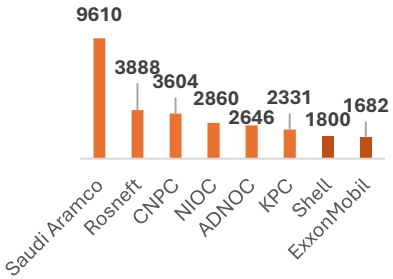
Source: IBIS World

Figure 2: Oil "majors" ranked by annual crude oil production, mbpd



Source: Companies' reports

Figure 3: Oil "majors" and NOCs ranked by annual crude oil production, mbpd



Source: Companies' reports, analysts' estimates

The oil and gas industry is among the world's largest sectors in terms of revenue, estimated to generate around $4.2 trillion in revenue as of 2024 (IBIS World 2024).

Oil and natural gas are major industries in the energy market and play an influential role in the global economy as the world's primary fuel sources, ensuring heating, transportation and manufacturing. The industry is typically divided into three main segments – upstream, midstream and downstream. The upstream is dedicated to exploration and production; midstream companies are dedicated to the transportation and storage of oil and oil products, and downstream companies focus on the refining and marketing of oil products (Library of Congress 2024).

Key Players

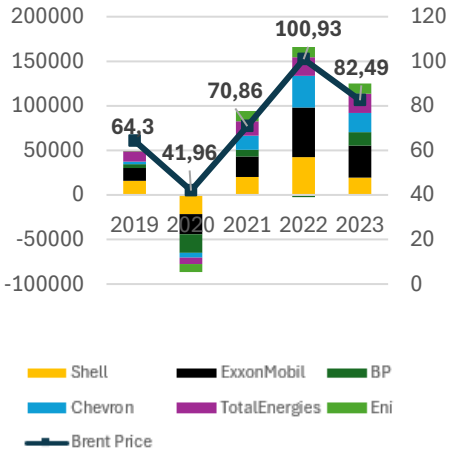
The largest companies in the industry are integrated, meaning that they are involved in each segment of the industry, as is the case of Galp. The six or seven largest publicly traded companies in the sector are commonly known together as the "supermajors" or just "majors", and more broadly along with other large private companies as IOCs (international oil companies) (Library of Congress 2024).

Companies such as ExxonMobil, Chevron, BP and Shell are frequently mentioned as part of the "majors" group. However, there are other several large oil and gas exploration companies which are state-owned, also known as national oil companies (NOCs), which are often opaque in relation to their operating data (Library of Congress 2024). In Saudi Arabia, the company which is given mandates to exploit national resources is Saudi Aramco. Aramco alone represents a larger share of the total oil produced in 2023 than all the "majors" combined. We can see that, ranking by annual production, the industry's biggest players are NOCs.

Market Dynamics

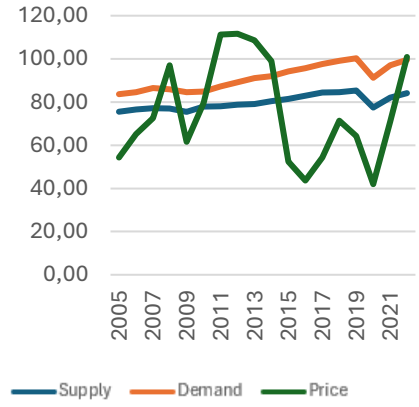
Oil prices are the main determinant of the profits and margins of oil and gas companies. The year 2022 set the record for the largest annual profits the industry has seen, following a recovery from the COVID-19 pandemic and the Russian invasion of Ukraine (IEA 2023). Geopolitical factors and the influence of OPEC are among the most relevant factors shaping oil prices and industry profits and determining investment decisions for industry players. These shocks create uncertainty in future supply and demand, and result in high price volatility. Both supply and demand are very inelastic for price changes in the short term, due to the years it takes to significantly change the production capacity and the difficulty for consumers to change fuel sources in the short term. Under these

Figure 4: Oil "majors" yearly profits, in $ millions, and average annual brent crude oil price for the year



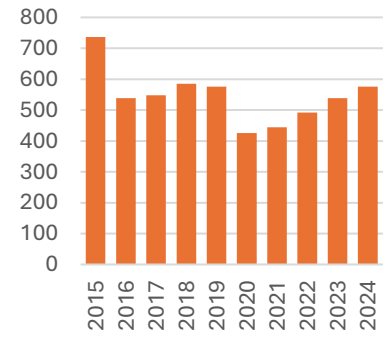
Source: Companies' reports, Statista

Figure 5: Demand (in orange), supply (in blue), and brent crude oil prices in $ (green). Demand and supply in mboepd.



Source: IEA, OPEC, Statista

Figure 6: Yearly total upstream investment by the O&G industry, $ billions



Source: IEA

circumstances, large price swings can be necessary to rebalance supply and demand (EIA 2024).

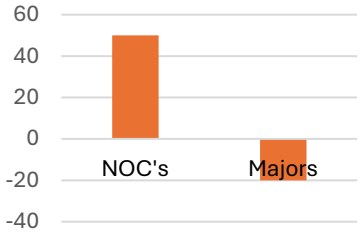
The impact of OPEC in shaping oil prices cannot be ignored. The OPEC was formed in 1960 and has since expanded to 13 members. The member countries are among those that have the largest oil reserves in the world, and the organization meets frequently to set production targets for oil, to help manage global oil prices for the group (EIA 2024). In 2016, OPEC signed an agreement with other 10 oil producing countries, to create the so-called OPEC+, with a notable new member being Russia. Together, OPEC+ countries in 2022 accounted for 59% of the world's oil production (EIA 2024). Between 2016 and 2020, production targets were set among member countries, aiming to keep oil inventories low and lifting crude oil prices up (Quint and Venditti 2020). The ECB suggests that on average, during this period, OPEC's strategy increased crude oil prices a modest $4 per barrel (Quint and Venditti 2020). OPEC production announcements also played a role in the oil price surge in 2022 (Qi Zhang 2023).

The impact that geopolitical tensions can have on the sector and on the broader economy could be shown during the Russian-Ukrainian conflict. Following the invasion, Brent crude oil prices rose significantly, surpassing the barrier of 130$ per barrel, the highest since July 2008 (CNBC 2022), and it is estimated that the conflict led to an increase in WTI and Brent crude oil prices of 70.72% and 73.62% respectively (Zhang, et al. 2024). The price increase in oil prices after the outbreak of the war was caused by speculative investor activities, who were predicting a decrease in the global supply of oil, OPEC+ modest production announcements, which kept supply low, and the exacerbation of the already low inventory situation (Qi Zhang 2023). The European ban on oil imports from Russia led to a global shift in energy flows. It forced EU member countries to increase imports from other regions, such as the US, Norway, and Algeria (Euronews 2023). Compared to 2021, US LNG exports to the EU increased by 141% (EIA 2023). Russia, on the other hand, had to strengthen other trading relationships, namely to Asia-Pacific, with crude oil exports to China and India increasing to 70% from a previous 20% (ECB 2023).

Upstream and Downstream Investment Outlook

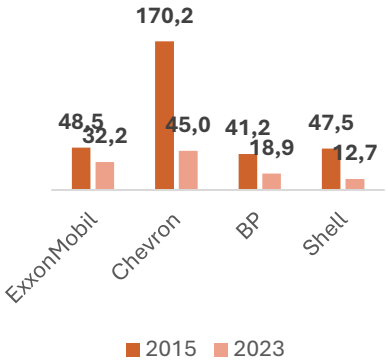
For the upstream segment, investment has increased in 2023 by 9%. In recent years, investment in this segment has mostly been driven by national oil companies of the Middle East and Asian continent. Between 2017 and 2024, investment by Middle East and Asian NOCs has risen by 50%, while investment by IOCs fell by around 20% (IEA 2024). Industry-wide, investment in upstream

Figure 7: Change in Upstream investment between 2017 and 2024, NOCs vs Majors, in %



Source: IEA

Figure 8: Upstream capex per barrel of oil produced



Source: Company's reports, own estimates

activities has decreased in the last decade. After oil prices plunged between 2015 and 2016, investment rose gradually until 2019, before the COVID-19 pandemic and the resulting lower demand for oil decreased investment yet again. Only in 2024 is investment expected to return to pre-pandemic levels. Apart from Middle East and Asian NOCs, the rest of the industry has kept investment levels low, especially comparing with 2015 (IEA 2024).

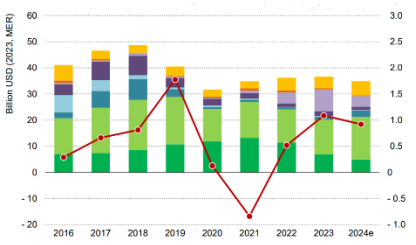
We believe the main reason for this has been the increasing importance of ESG. IOCs have been under internal and external pressure to establish and meet certain climate policies. In 2021, Shell was ordered by a court in the Netherlands to reduce its emissions by 45% by 2030, in a case brought to court by an environmental group (The Guardian 2021). In October the same year, Shell announced an absolute emissions reduction of 50%, by 2030, compared to 2016 (Shell 2021). In 2020, BP announced its net-zero emissions goal for 2050, aiming to reduce its oil and gas production by 40% in 2030, while investing in clean energy (BP 2020). The difference in the level of commitment between majors to the energy transition can be seen in **Appendix Figure 1**, in which we see both ExxonMobil and Chevron were slower than their peers to commit to Net Zero, and only did so to scope 1 and 2 emissions, not establishing any rigid targets on scope 3, which represents the vast majority of emissions. This difference in commitments can also be illustrated by comparing upstream investments of both companies, where in 2023 we can see a much lower capex on a per barrel basis by BP and Shell compared to ExxonMobil and Chevron, while in 2015 differences between ExxonMobil, BP and Shell were much lower.

Despite the reported investor pressure on the industry, the stock performance for the past 5 years seems to have rewarded ExxonMobil and Chevron's more cautious approach to the energy transition, as seen in **Appendix Figure 2**.

As a result, these companies are rolling back their earlier commitments. BP has reduced its output reduction target from less 40% to only less 25% by 2030 (Reuters 2024). Shell has sold part of its renewable business, and scaled back projects of offshore wind plants, hydrogen and biofuels, including the 200 MW renewable hydrogen production facility in Rotterdam, that would be the largest in Europe if completed (Reuters 2024).

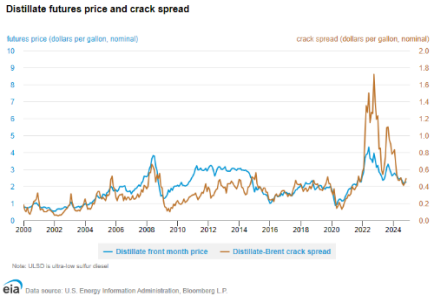
In general, investors seem to be prioritizing near term high returns from the upstream business. For the foreseeable future and taking into account recent shifts in strategy among majors in the industry, it's likely that upstream investment keeps rising, by IOCs and NOCs alike.

Figure 9: Investment in oil refineries by region (greenfield and upgrades), and net refining capacity additions in mb/d (red line). Light green represents China and India, and dark green is Middle East



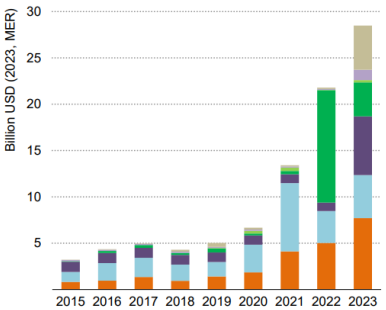
Source: IEA

Figure 10: Distillate futures price and crack spread, blue line and brown line respectively (zoomed in the appendix)



Source: EIA

Figure 11: Oil and gas investment in clean energy.



Source: IEA

In terms of refining investment, most of the 1.3 mb/d net capacity addition in 2023 was driven by China, and the forecasted 0.8 mb/d increase in 2024, with China and India most likely contributing for half of this increase. Despite this, total investment is expected to decrease by 5%. While in 2022 margins were at a record high, in 2023 margins began to decrease (IEA 2024). The figure 10 shows the evolution of the distillate-brent crack spread, which we can see has reverted to the pre-COVID-19 level. (EIA 2024)

The construction of new refineries is capital intensive and characterized by long lead times (ranging between 5 to 10 years), and uncertainties surrounding long-term demand prospects present challenges for investment decisions (IEA 2024). More recently, companies such as PetroIneos and BP have announced the closure of a plant and reducing of processing capacity respectively, citing growing overseas competition, a rise in EV sales, and stricter environmental regulations as reasons (BBC 2024) (Reuters 2024). Therefore, in the future, capacity additions are likely to be in Asia and the Middle East, where demand for oil is forecasted to grow.

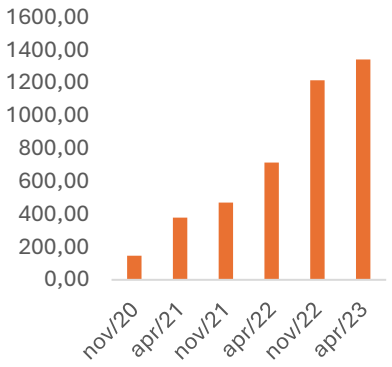
Despite recent change in strategy regarding the aggressiveness of energy transition investment, O&G companies have been ramping up investments in clean energy: the industry invested a total of USD 28 billion into clean energy, which represents a 30% increase from 2022 levels (IEA 2024). In 2022 investment in clean energy grew even more, by 65% more compared to 2021. However, even though investment has been rising, it still represents less than 4% of the industry's total capital investment (IEA 2024).

The recent increase in interest rates has risen the cost of borrowing and the cost of equity, and the resulting higher cost of capital makes it harder to generate attractive risk-adjusted returns, with this fact being especially true for investments like clean energy, which are capital intensive, forcing companies to become more selective in which renewable energy projects to pursue (IEA 2024).

Therefore, it is likely that going forward, transition efforts by O&G companies will be concentrated on improving operational activity and reducing emissions, as well as investing in clean energy technologies that can create synergies, through the leverage of the expertise and already existing infrastructure of O&G players. Low-emissions hydrogen production is one example, since the industry is already a large producer and consumer of hydrogen, used to refine and upgrade oil, and existing infrastructure to store and transport gas are relevant for hydrogen production because of chemical similarities (McKinsey 2023).

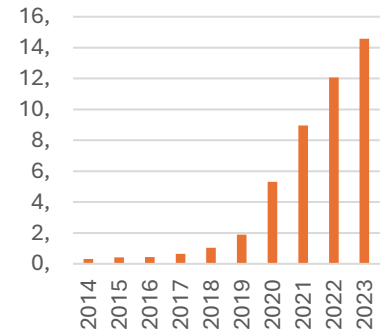
Company Overview

Figure 12: Government spending for clean energy investment support



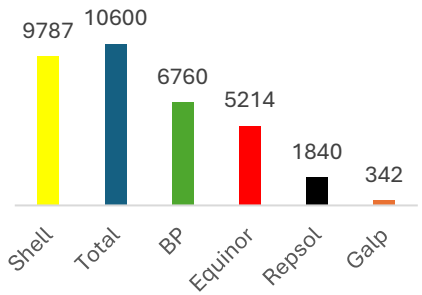
Source: IEA

Figure 13: Share of new zero-emission vehicles in all new vehicles, passenger vehicles, EU27



Source: Eurostat

Figure 14: European oil company's proved reserves 1P (mboe)



Source: Company's anual reports

As a player in the O&G sector, Galp is vulnerable to all sources of risks that energy markets face, and enters 2023 following a year of major supply chain disruptions and heightened price volatility, caused by the Russian-Ukrainian conflict. Towards the end of 2023, the ECB and the US Federal Reserve announced interest rate hikes, in an effort to curb inflation, adding to the already mounting macroeconomic uncertainties.

Aside from the geopolitical risks affecting oil and gas prices, globally governments have been increasingly incentivizing the energy transition, punishing carbon emissions and subsidizing renewable investments. Consumers are changing their preferences, towards vehicle electrification, and investors are growingly more worried with ESG practices in the companies they have a stake on. On the other hand, the current macroeconomic scenario of tightening interest rates is making investing in renewables more challenging.

It is in this scenario that Galp operates, trying to balance the need to address the global concerns related to climate change and the demand shift towards decarbonisation, as geopolitical risks and regulatory pressures and incentives mount towards renewable energy investments, while at the same time ensuring energy security for their customers and delivering high risk-adjusted returns to the stakeholders.

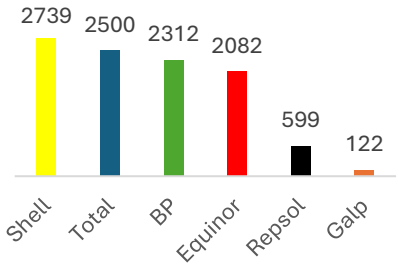
Galp's road to sustainability will have to advance responsibly, considering the still growing demand for fossil fuels and the regional reliance on the Sines refinery as an energy supplier, while trying to reduce emissions and investing in renewables as demand for them grows, and their underlying technology becomes better and cheaper. The decarbonisation commitment made by Galp is thus dependent on the changes in government policies, changes in fossil fuel and green energy demand, and macroeconomic factors affecting access to capital.

Upstream

The upstream segment of Galp is dedicated to the exploration, development and production of hydrocarbons, covering activities from searching for potential oil and gas fields to the extraction of resources. The company is currently operating in Brazil, Namibia and São Tomé and Príncipe.

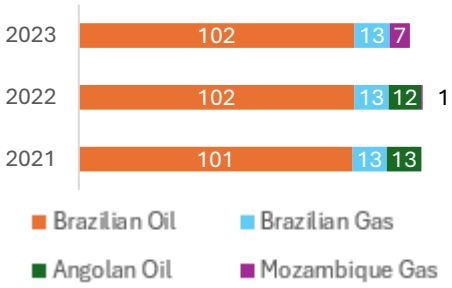
Galp's upstream segment is considerably small when compared with the main European players. As of 2023, Galp's proved reserves totaled 342 mboe which is significantly lower than Shell, Total Energies and BP reserves. Similarly, Galp's

Figure 15: European oil company's WIP (kboepd)



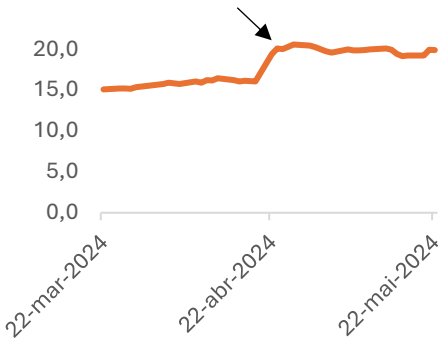
Source: Company's anual reports

Figure 16: European oil company's WIP (kboepd)



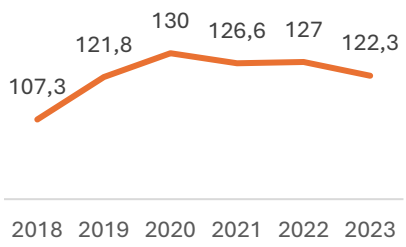
Source: Galp's annual report

Figure 17: Impact of Namibia discovery on Galp's stock price (€)



Source: Yahoo Finance

Figure 18: Galp's historical WIP (Kboepd)



Source: Galp's annual report

production of 122 kboepd is significantly below the output these European peers generated. Even within the Iberian Peninsula, Repsol stands out as a much larger operator with proved reserves of 1840 mboe and a production of 599 kboepd, making it the larger upstream player in the region.

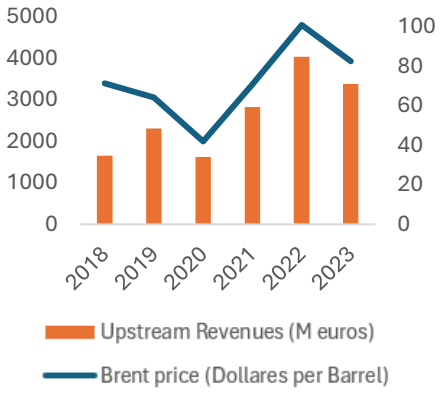
Galp's upstream segment has a diversified geographic presence, with its projects located in different regions of the globe. Brazil has historically been the main source of both oil and gas to Galp's Upstream operations and currently it is the only one as Galp decided to divest from the Upstream assets located in Angola and Mozambique. Galp's portfolio in Brazil is exclusively offshore and it is mainly located within the pre-salt polygon. Tupi and Iracema are under development and production phase, having the biggest contribution to Galp's working interest production since 2010, when they started producing. These are the oldest projects that Galp has a stake on. Moreover, Galp's portfolio in Brazil also includes the Berbigão, Sururu, Atapu and Sépia accumulations which are also in the development and production phase and have all already reached plateau in recent years. Also in Brazil, Galp also has an interest in the Bacalhau project, which is one of the most competitive developments underway mainly due to the high-pressure conditions of the reservoir as well as the low carbon intensity at 9kgCO2e/bbl. For comparison, the average carbon intensity of industry portfolios is set at 17.8kgCOe2. Galp expects this project to account for 40 kboepd when reaching plateau which is around one third of the current WIP.

Besides the Upstream projects in Brazil, Galp also has other projects which are still on the exploration phase in Namibia and São Tomé and Príncipe. In Namibia, the discovery of large light oil columns in high quality reservoir sands is also a significant source of long-term growth for the company. The company currently holds a license to explore an area that covers around 10000 km2 in the orange Basin. Galp owns an 80% working interest in this license. Based on the exploration campaign, Galp expects oil in place to be 10 bn boe. After this oil discovery, the stock price has increased by more than 20%, which shows how significant this finding was. Also worth noting, Galp is the operator of its projects in Namibia and São Tomé and Príncipe, unlike in Brazil, where it participates solely as a partner in all its projects.

During the past few years, this segment has been subject to major changes and challenges

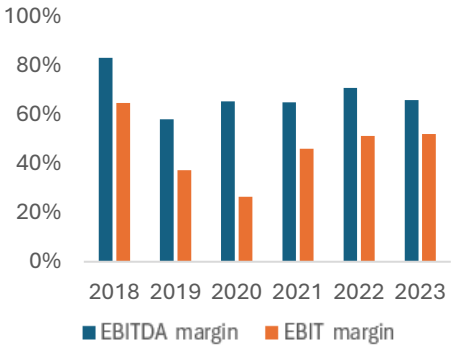
In 2020, the segment was strongly impacted by the pandemics. During this year, Galp was able to increase its WIP driven by an increase in output from the fields in Angola and Brazil. However, this was not enough to compensate for the abrupt

Figure 19: Upstream revenue in million € (left axis) vs Brent price $/boe (right axis)



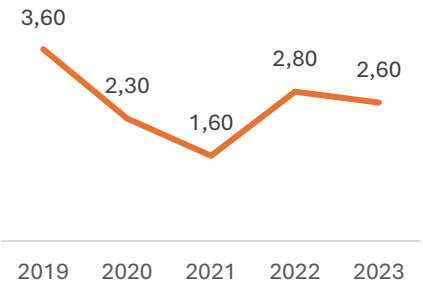
Source: Galp's annual report

Figure 20: Historical EBITDA and EBIT margin



Source: Own estimates and Galp's annual report

Figure 21: Historical production costs ($/boe)



Source: Galp's annual report

decrease in brent prices caused by a global decline in demand for oil (due to the lockdowns and mobility restrictions) and by an excess in supply since OPEC+ did not cut output quickly enough. The average brent price for the year was 42 $ per barrel, the lowest value since 2004, and this was translated into a significant drop in the segment revenues.

In 2021, the company had a slight decrease in total WIP, reflecting maintenance activities on projects in Brazil and Angola. Driven by the recovery in demand, brent oil prices rose once again resulting in revenue levels above the ones seen before the pandemic.

In 2022, the brent price continued its upward trend driven by geopolitical tensions, particularly Russia-Ukraine conflict, which caused global oil supply disruptions. The price increase contributed to a higher segment revenue. In 2023, however, the prices decreased again due to a more balanced oil supply-demand dynamic. Also, total oil produced by Galp decreased because of the decision to divest from the Angolan upstream assets, which had contributed with 12,7 kboepd to WIP in the previous year. All this factors together, led to a drop in upstream revenue. Meanwhile, during this year, Natural Gas production in Mozambique rose significantly with the full ramp-up of Coral FLNG in 2023, reaching plateau at the end of the year.

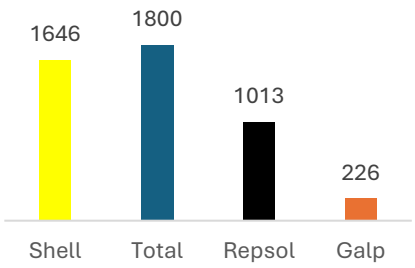
In 2024, Galp has decided to divest its 10% stake in Area 4 Mozambique, which will have a substantial impact on the Upstream WIP, as over a third of the total Gas produced in 2023 by Galp was originated from Mozambique.

In the figure 20, we can see the evolution of Galp's EBIT and EBITDA margins. As we have already seen, Galp's upstream revenues are highly dependent on brent prices making them too volatile. Because of this, these margins are not the most reliable measure of the company's operational efficiency, as the revenue per barrel vary significantly year to year due to external factors, even if the production costs remain steady. If we focus solely in the margin, this could lead us to misleading conclusions regarding operating efficiency. Keeping this in mind, a more accurate approach to access Galp's operating efficiency is to look at the production cost per boe. For instance, in 2022, Galp production costs/boe increased to 2,8$ but the company was still able to increase the margin driven by the abrupt increase in prices and, consequently, on revenues.

Industrial & Midstream

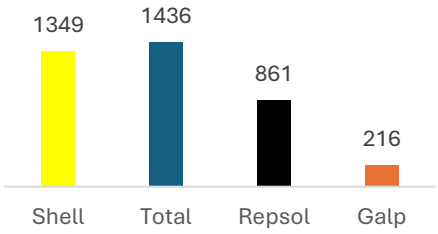
The industrial and Midstream segment is dedicated to the transformation of crude oil and other raw materials into various refined products. This segment is key to

Figure 22: Refining capacity (kbpd)



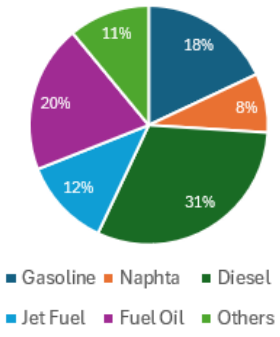
Source: Company's reports

Figure 23: Quantity processed in 2023 (kbpd)



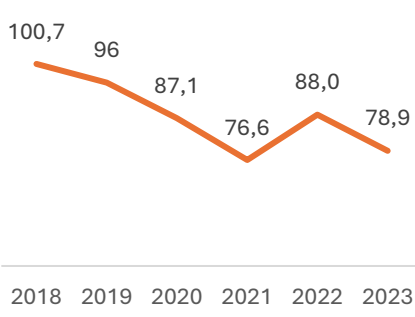
Source: Company's reports

Figure 24: Refining Outputs



Source: Company's reports

Figure 25: Galp's historical volume of raw materials processed (mboe)



Source: Galp's annual reports

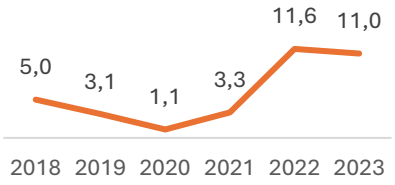
Galp's operation as it works as a link between the upstream activities and the commercial operations. This segment also encompasses midstream activities, which include the management, transportation and storage of energy resources such as oil products, natural gas and electricity.

Within the European context, Galp's Industrial and Midstream segment is relatively small compared to the main players in the industry. As of 2023, Galp had a distillation capacity of 226 kbpd and processed approximately 216 kbpd during the year. This is significantly lower than Total Energies or Shell. Within the Iberian Peninsula, Repsol has a total distillation capacity of 1013 kbpd and processed 861 kbpd of raw materials in 2023, making it the largest refining operator in the region. These numbers show that Galp is relatively small compared to the main refiners in Europe, operating just one refinery, while its larger competitors operate multiple. Galp's refining operations are concentrated at the Sines refinery in Portugal. This complex is the only operational refinery in Portugal and is one of the largest in the Iberian Peninsula and it can handle a wide range of crude oil types. Regarding inputs, crude oil represents 85% of the total raw material processed, with most of this volume consisting of medium and heavy crude oils. In terms of the outputs, the refinery produces fuel oil, gas, light distillates such as naphtha and gasoline and middle distillates including diesel, jet fuel and biodiesel.

Regarding the total volume of raw materials processed, it has fluctuated significantly due to various factors. In 2020, the quantity has decreased almost 9 mboe, driven by the low demand for refined products. Furthermore, in 2021, Galp decided to discontinue the operations in the Matosinhos refinery, which had a distillation capacity of 100 kbpd, contributing to a further decline in quantity of raw materials processed. In the following year, with the improvement of the international environment and in demand for oil products, total quantity processed finally rose. However, in 2023, due to planned maintenance activities, Sine's refinery had to close for two months which resulted in a decrease of around 9 mboe in the volume of raw materials processed when compared to 2022.

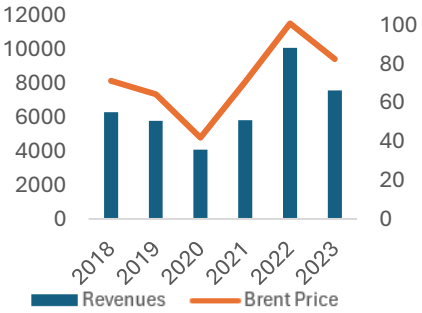
Similarly to what happens with the upstream segment, the industrial and midstream revenues are also highly dependent on oil prices and therefore they have experienced fluctuations over the past years. For instance, revenues have decreased in 2020 not only because of the decrease in the volume of refined products, but mostly due to the drop in the oil price and low refining margins, reflecting the challenging macroeconomic conditions. In the following year, the rise in oil prices and recovery in the refining margin more than compensated for the drop in the volume of refined products, resulting in higher revenues. In 2022, Galp achieved its highest ever refining margins, driven by a strong recovery in demand

Figure 26: Galp's historical refining margin ($/boe)



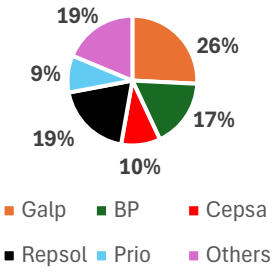
Source: Galp's annual reports

Figure 27: I&M revenues (right axis) vs Brent price (left axis)



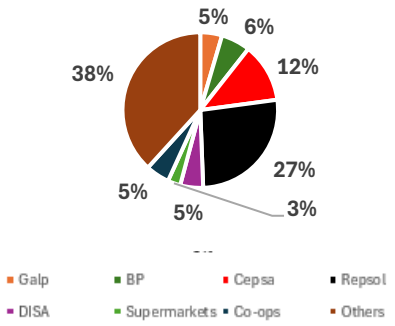
Source: Galp's annual reports

Figure 28: Market shares of gas stations in Portugal by operator



Source: Marktest, company's reports

Figure 29: Market shares of gas stations in Spain by operator



Source: AOP

for oil products. Combined with the increase in oil prices and the volume of raw material processed, this led to a more than 70% increase in the segment revenues. In 2023, segment revenues decreased again because of a drop in oil prices and quantity of raw materials processed. However, the company was still able to sustain a robust performance, with refining margins remaining high, which have contributed to reach a revenue level still above the ones observed before 2022.

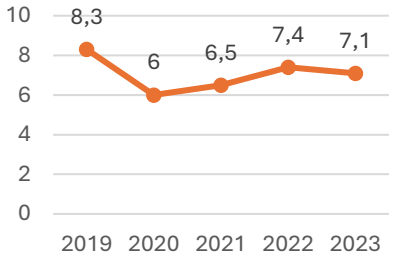
The midstream segment is related to energy management and encompasses the transportation, supply and storage of oil and oil products, which is responsible for the placement of Galp's equity crude oil production and it's also responsible to manage the procurement of crude oil and other raw materials to optimize the refining system. Midstream also encompasses the supply of NG and LNG, with the company engaging in long-term sourcing activities. Lastly, Midstream is also responsible for the supply and trading of power, with Galp having a presence in the Iberian electricity spot market (OMIE) and on the forward market (OMIP).

Commercial

The commercial segment of Galp is responsible for the distribution and marketing of refined oil products, natural gas, electricity to end consumers, as well as convenience services and multi energy solutions, such as decentralised solar energy and EV charging points. The company currently operates in Portugal, where it has a leading position, in Spain, where it has an established position, and in Africa, through the stakes in has in 5 companies, in Cape Verde, Guinea Bissau, Angola, Mozambique and Eswatini, a continent in which Galp anticipates strong market growth.

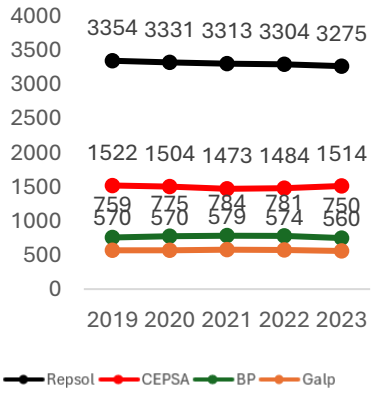
The commercial segment has three other sub-segments, Enterprise, which offers energy solutions to B2B clients, Mobility, which offers energy solutions and retail convenience through Galp's network of 1463 service stations, and Residential, providing natural gas, electricity and energy efficiency solutions to households. Mobility and Residential are the two B2C sub-segments of the Commercial segments. The B2B segment accounts for most oil product sales, 61% and 62% in 2022 and 2023 respectively, while the B2C segment sales corresponded to 31% and 30%, in 2022 and 2023 respectively, of total sales, with the rest attributable to the international segment (operations in Africa), in both years.

Figure 30: Amount of oil products sold



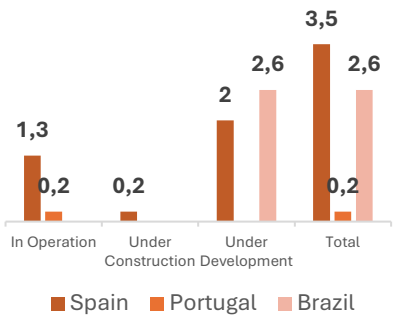
Source: Galp's annual reports

Figure 31: Number of Gas stations by operator, Spain



Source: AOP

Figure 32: Galp Solar PV portfolio



Source: Galp's annual reports

As of 2023, the amount of oil products sold still has not recovered to the level of 2019, prior to the pandemic. From 2020 until 2022 it had increased, mostly due to the recovery in demand. A decrease in demand from the B2B sector in Spain, however, decreased the amount sold again in 2023.

The number of service stations has remained quite stable. Compared to 2019, Galp currently operates two less service stations. In Spain however, one of the main markets of Galp, the trend has not been of stabilization but rather of a gradual decline: the number of service stations operated by the largest operators has been decreasing since 2019.

The need to adapt to changing consumer demand has led Galp to invest in electric mobility charging points, establishing itself as a key player in Iberia. As of 2023, Galp has consolidated an electricity volume share of 17% in Portugal. In 2023, Galp had 4827 points in Iberia, and is targeting 10 thousand by the end of 2025.

Renewables & New Businesses

The Renewables & New Businesses is the most recent unit, started in 2019, and part of Galp's low carbon strategy. This segment is mostly dedicated to the generation of renewable electricity, via solar photovoltaic (PV) panels. Galp's strategy for this segment revolves around establishing a strong presence in its core markets, where the company's integrated value chain can be leveraged to generate synergies, in operational efficiencies and cost reductions.

As of 2023, Galp already has a relevant portfolio and has established itself as one the largest players in solar PV production in Iberia, with plants in operation in both Portugal and Spain. Last year, it produced around 5,92% of all total solar PV energy generation in Portugal and Spain[1]. Other than Iberia, Galp is only present in Brazil, owning projects that are currently under development. As of today, Galp has a total production capacity of 1.4 GW, and it currently has projects in construction and in earlier stages of development in Portugal, Spain and Brazil, totalling 5.5 GW of capacity to be installed. As a result of more added generation capacity, in 2023 Galp increased its renewable energy generation from 1.9 TWh to 2.3TWh. Earlier in 2023, Galp inaugurated a 144 MWp solar PV plant in Alcoutim, Galp's first solar project in Portugal, which is the 4th largest solar plant in operation in the country.

[1] According to REN, 7% of the total electricity generated was solar PV (out of 31.2 TWh), and according to REE, 37.322 TWh of solar PV were produced in 2023. Galp's total output was 2,332 TWh, corresponding to the 5,92%.

Figure 33: Largest solar plants in Portugal

	Output (MW)
Central Fotovoltaica Riccardo Totta	220
Central Fotovoltaica da Cerca	202
Central Solar Fotovoltaica de Santas	180
Parque Solar de Alcoutim	**144**
Central Solar Fotovoltaica do Cabeço Vermelho	96

Source: OpenInfraMap

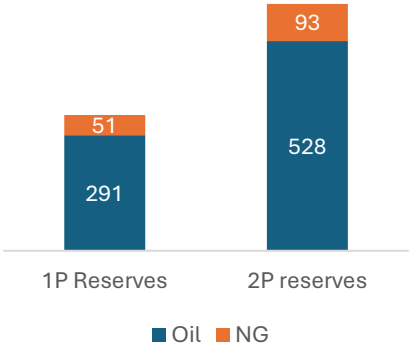
Solar PV investment comes with challenges, however. The recent increase in interest rates has made investing in renewable sources more challenging, due to the capital-intensive nature of investing in solar plants. Furthermore, during this year electricity prices have decreasing compared to 2023, with Galp revealing that prices were 50% lower during the first 9 months of the year, compared to the same period last year in its 3Q report of 2024. As of this year, Galp CEO has admitted that the 4GW of capacity in unlikely to be met, and the target of 12GW of installed capacity for 2030 has been retrieved as well from the latest annual report.

Forecast & Analysis

Upstream

To better estimate the Upstream revenues, we tried to identify their main drivers and to project them. The main drivers of this segment are the working interest production, including both oil and gas, as well as the revenue received for each product sold.

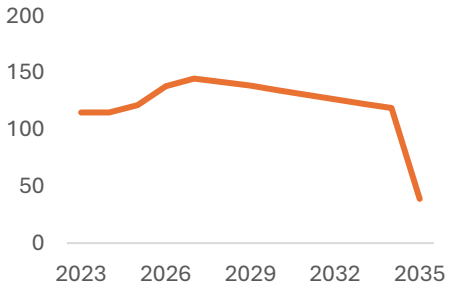
Figure 34: Galp's 1P and 2P reserves (mboe)



Source: Galp's annual reports

Regarding working interest production, as previously mentioned, it declined in 2023 due to the decision to divest from the Angolan upstream assets and we anticipate further decreases in the quantity produced as Galp has also decided to divest from its upstream assets in Mozambique. As a result, the Brazilian projects are now the only contributors to the company's production. The first step in forecasting future production is to analyze the total recoverable oil and gas reserves. According to Galp's latest annual report, the company holds 342 mboe of 1P resevres and 621 mboe of 2P reserves from which oil represents 85%. 1P reserves refer to the proven reserves, while 2P include both the proven and the probable reserves (reserves with a recovery probability between 50% and 90%). For our forecast, we assumed that total recoverable reserves comprise all proven reserves plus 70% of the probable reserves which reflect the likelihood of recovery. When projecting the future working interest production (WIP), it's essential to consider both the output from current projects and the production that is expected from new projects that are yet to come online. The current WIP reflects contributions from Tupi and Iracema, the oldest project and the largest contributors to Galp's WIP, as well as from Berbigão, Sururu, Atapu and Sépia which are the other projects currently in development and production stages. For the first 9 months of 2024, Galp reported a daily WIP of 109 kboepd, lower than the 114,9 kboepd observed in the previous year. This decline likely results from the natural aging of fields like Tupi and Iracema, which have been in production since 2010. In 2025 onwards, we anticipate a continued decline in production from these older

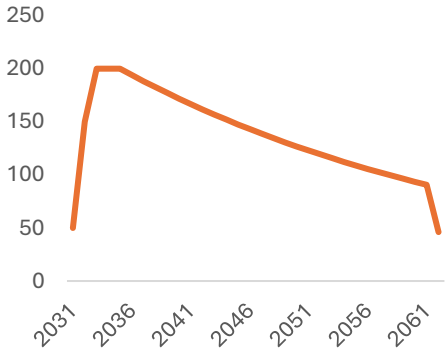
Figure 35: Brazilian fields production (kboepd)



Source: Own estimates

fields, assuming a 3% annual decline rate. Furthermore, in 2025, we need to consider the ramp-up of the Bacalhau project, which is expected to start production in the second half of the year and will boost Galp's WIP. Since this project has not yet started, historical production data is unavailable but Galp estimates that the project will reach a plateau production of 40 kboepd. Furthermore, we assumed a one year and a half ramp-up period, meaning that the project should achieve a plateau by 2027, followed by a 3-year plateau stage, before entering a decline phase. We expect the production from these projects to persist until their available resources are fully exhausted.

Figure 36: Mopane (Namibia) production (kboepd)



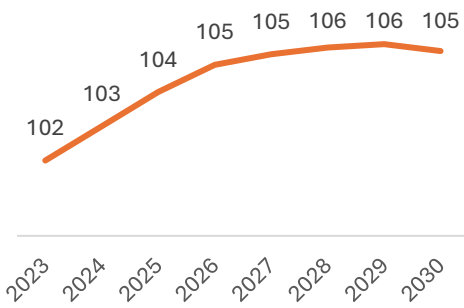
Source: Own estimates

Galp's upstream portfolio also includes an oil field located in Namibia, known as Mopane. This project has an estimated 10 billion boe of hydrocarbons in place and represents a major discovery for the company. Although the project remains in the early stages of exploration and detailed information is limited, it is a project we should consider due to its significant size. Of the 10 bn boe in place, only a portion can be recovered. Galp's past projects had a recovery rate typically ranging from 15% to 30% and we decided to adopt a conservative approach and assumed a recovery rate of 20% for Mopane. This means that the recoverable reserves are 2 bn boe and since Galp holds an 80% share on this project, the company's share of recoverable reserves would be 1.6 billion boe. To estimate production levels, we decided to analyze similar projects with comparable reserves. The project we based ourselves was the Venus project operated by Total Energies and, similarly to Mopane, is located on the Orange Basin, in Namibia. Venus also has 2 Bn of boe of recoverable reserves and is expected to produce approximately 250 kboepd. We assumed a similar production profile for Mopane by using Venus as a reference, with the field maintaining this level during the plateau phase before entering a gradual decline. The Venus field was discovered in 2022 and is projected to start production in 2029. Since Mopane was discovered 2 years later, we expect it to begin production in 2031, assuming a similar development period for both oil fields.

Another important upstream driver is the revenue per barrel of oil which is primarily influenced by the brent crude oil price. The price of brent crude oil is driven by external factors, mainly global oil demand and supply. For 2024, we expect an average brent price of 81 dollars per barrel, consistent with the levels observed during the first 11 months of the year.

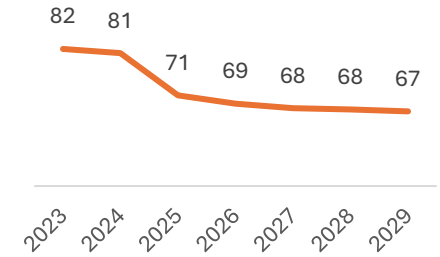
To forecast the brent prices beyond 2024, we first decided to analyze expected trends in oil demand and supply. The post-pandemic recovery has slowed down recently, and, at the same time, there has been a rapid adoption of clean energy technologies. Keeping this in mind, IEA expects that the oil demand growth - 2.1

Figure 37: Oil demand (mb/d)



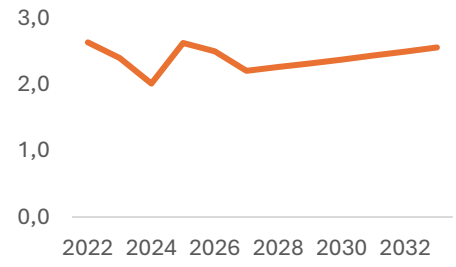
Source: IEA

Figure 38: Brent Crude Oil future contracts price



Source: Bloomberg

Figure 39: Productions costs (€/boe)



Source: Own estimates

mb/d in 2023 - will start to decelerate and turn negative in 2029 (IEA 2024). This implies that global oil demand will continue to increase but at a slower pace, peaking at 105.6 mb/d in 2029, before entering a decreasing trend. Overall, the total increase in oil demand until 2030 will be 3.2 mb/d. On the other hand, IEA expects that world oil production capacity, driven by the US and other American producers, will exceed the demand growth during this same period pushing the spare capacity to unprecedent levels. Overall, total supply capacity is projected to rise by 6 mb/d, reaching 113,8 mb/d by 2030. However, IEA differentiates total supply capacity and the actual supply to the market. The actual supply to the market is forecasted to be 106.4 mb/d by 2030, representing an increase of 4.2 mb/d when compared to 2023. Therefore, total supply to the market is expected to increase slightly more than demand in the forecasted period (4.2 mb/d vs 3.2 mb/d).

Considering this dynamic between supply and demand of oil, we expect a gradual decline in brent prices by 2030 compared to 2024 levels, although not significantly. Keeping this in mind, we decided to rely on Brent crude oil futures contracts for our forecasts through 2030, as it aligns with this expected evolution in prices. After 2030, with oil demand plateauing and entering a decline, we project the downward trend in brent prices to continue, which is motivated by rising energy efficiency and a shift towards alternative fuels.

As for Natural Gas prices, we adopted a similar approach to the one used in the oil price forecasting and we based our forecast on natural gas futures contracts, which reflect current market expectations for price trends.

Regarding production costs, these are mainly related to the costs of operations and maintenance of FPSO's. When we look at the past years, we can clearly identify a downward trend in Galp's production costs driven by improvements in operational efficiency as well as efforts in optimizing the asset portfolio. For instance, production costs per boe have decreased after 2019, reaching their lowest value in 2021. However, we need to look with caution to these values as they were non-recurrent and the explanation is in the impact of the pandemics, which led to reduced labor and logistical costs during that period. After this period, production costs per boe rose again in 2022 but remained at a value significantly below the ones observed pre pandemics. In 2023, there was a slight decline, reflecting the already mentioned asset portfolio optimization driven by the exclusion of Angolan upstream assets. These assets represented a less efficient portion of Galp's upstream operations, and the divestment decision contributed to the cost efficiency improvement. In Galp's latest Investor Presentation, it is outlined the goal of maintaining production costs below $3/boe through 2025. For 2024, we

observed that in the first 9 months total production costs decreased around 21% and we assumed a similar trend for the last quarter of the year meaning that total production costs would be approximately €84 million for the year, reflecting a lower volume of hydrocarbons produced when compared to the previous year.

In 2025 onwards, we need to consider the Bacalhau project ramp-up phase. Production costs per boe tend to be higher in the ramp up of new projects because, although production volumes are initially low, the costs of operating the FPSO's are already incurred which means that the ratio of the costs/boe tend to increase. After the ramp-up of the project, volume produced typically increases, diluting the production costs and lowering the production costs per boe. Therefore, in 2025, we expect production costs per boe to rise, reflecting Bacalhau's ramp-up. In 2026 and 2027, we expect these costs per boe will decrease as hydrocarbon production increases, leading to a dilution of project costs. From 2028 onward, we forecast production costs per boe to grow at an average rate of 2,5% reflecting the expected natural decline in efficiency due to the aging of the fields as well as the expected increase in prices over time.

We also projected other operating costs based on the quantity of hydrocarbons produced. For 2024, we forecast these costs to average 17,6 euros per boe, which aligns with the average observed in the past five years (excluding 2020, which was an outlier). We took this approach because these costs per boe have remained relatively stable since 2019, except for 2020, when they dropped significantly due to the impact of covid 19.

As for royalties, these are payments that Galp needs to make for the right to extract and produce oil and gas. These payments are generally calculated as a percentage of the revenue generated from the oil extraction activities. Therefore, we expect royalties to vary with segment revenues. Over the past five years, royalty rates have ranged between 8% and 9% of the segment revenues. Consequently, we have based our royalty forecast on the historical average of 8,3%, which represents the average percentage over the last five years.

Industrial and Midstream

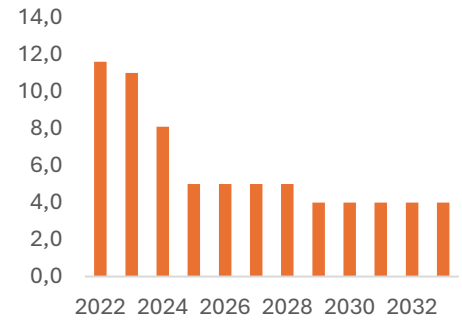
The first step when forecasting the Industrial and Midstream segment revenues is to identify the key value drivers. For the main drivers, we considered the volume of raw materials processed and price of the refinery's outputs. The output prices are in turn influenced by both the cost of the raw materials and the refining margin, which is the difference between the price received for the refined product and the price paid for the input. Therefore, we will project the quantity of raw materials processed, the cost of these raw materials and Galp's refining margin.

When forecasting the quantity of raw materials processed, we must consider the Galp's distillation capacity. As we previously mentioned, Galp's distillation capacity significantly decreased driven by the decision of discontinuing the Matosinhos refinery. This resulted in a lower level of raw materials processed, as the quantity processed in 2021 fell to 76,6 mboe while in the previous 3 years the average volume processed was 95 mboe. However, it is worth noting that this was not solely a consequence of the processing capacity reduction but was also influenced by the decrease in demand due to the pandemic. Keeping this in mind, when forecasting the quantity of raw materials processed, we expect it to be lower than the values observed before the Matosinhos refinery closure, but not as low as the values seen in 2021 which were also driven by covid 19, a non-recurrent event. The proof is that in 2022, the volumes processed increased again to 88 kbpd, which indicates the Sines refinery was operating near its full capacity. This level is more closely aligned with our expectations for Galp's refining performance.

If we exclude non-recurring events (e.g. covid 19), the main drivers of the raw materials processed are both the processing capacity and demand fluctuations. These are the two key factors that we will consider when forecasting the quantity of raw materials processed. On the one hand, we don't anticipate any changes in processing capacity, as Galp does not have any plan to expand the Sines refinery or to build another refinery. On the other hand, regarding demand for refined products, we anticipate a decrease in demand for traditional fuels (e.g. diesel and gasoline), mainly driven by the increasing adoption of electric vehicles, but we expect this decrease in demand for certain products to be offset by the demand for other types of refined products, namely jet fuel, naphtha or biodiesel. Jet fuel, for example, is unlikely to be replaced in the near term, as the aviation industry is still dependent on it. Additionally, it is expected that naphtha will maintain a strong demand because it is a required raw material to produce plastics and there is no substitute for it yet. Taking all these reasons into account, we do not expect the total quantity of raw materials processed to decrease. What we expect is a change in the quantity produced of each type of refined product, by shifting towards products with growing demand and reducing focus on lower demand products. This change in the product mix allows Galp to adapt itself to new market dynamics and therefore the Sines refinery will be able to keep operating close to full availability.

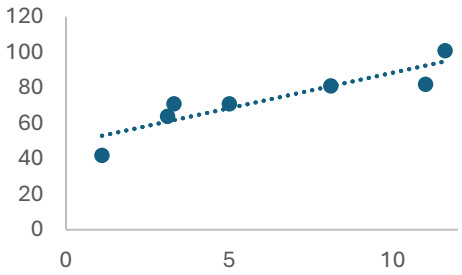
As for Galp's refining margins forecast, it is important to understand what factors have influenced them over the past years. In 2020 and 2021, refining margins dropped to unusual low levels driven by the covid 19 pandemic. This was something transversal to the refining industry, as the demand for refined products

Figure 40: Refining margins ($/boe)



Source: Own estimates

Figure 41: Brent price ($/boe) in yy vs refining margins ($/boe) in xx



Source: Galp's annualreports

during this period was also low. After this period, we observed a strong recovery in the demand for gasoline, diesel and jet fuel during the post pandemic which helped Galp achieve all-time highs refining margins of 11,6$/boe and 11$/boe in 2022 and 2023, respectively. On top of that, supply disruptions caused by geopolitical tensions (particularly disruptions in refined products following the Russia-Ukraine conflict) and by tight global refining capacity have supported even more refining margins. In the first 3 quarters of 2024, Galp's refining margin was 8,1$/boe which is in line with our expectations of a margin decrease driven by a more balanced supply-demand environment as geopolitical tensions ease and global refining capacity normalizes. Moreover, when we look at the past years, we observed that higher oil prices tend to be associated with higher refining margins. We believe that there is this relation between refining margins and oil prices because refining margins are mainly influenced by demand for refined products which in turn is one of the main drivers of oil prices. Having this in mind, we believe the average refining margin will decrease in 2025 to 5$/boe, following the same trend of the average oil prices, and we believe it to remain at this level until the end of the decade. In 2030 onwards, the demand for oil products have already reached its peak and it starts a decreasing path, and therefore we forecasted refining margins to shrink to 4$/boe.

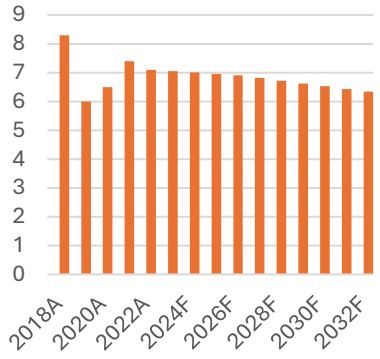
To conclude the Industrial and Midstream revenue forecast, we also need to forecast the revenues coming from the energy management business. For this specific business, we believe that its performance is closely linked to broader economic activity, since it includes the supply of essential inputs for industrial production, transportation and power generation which are key drivers of economic growth. We expect the demand for these energy products to be correlated with GDP expansion and, given this correlation, we forecast the revenues of the Energy management segment to grow in line with GDP.

The cost of goods sold in the refining industry is mostly variable, accounting for approximately 95% of total costs (Krungsri 2024). These variable costs are mainly composed of crude oil inputs, making raw material expenses the primary driver for COGS, with the remaining being related to the energy consumption during the refining process. Therefore, we will forecast the cost of goods sold based on each year's revenues. We will assume them to be equal to the last three years' average percentage of revenues.

Commercial

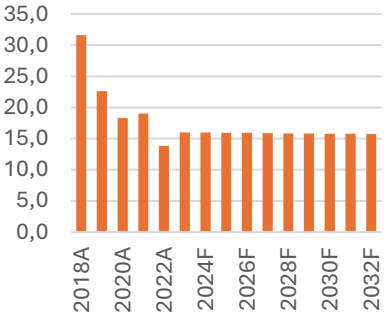
The commercial segment involves the B2B and B2C sale of 3 major categories of products: oil products, natural gas and electricity.

Figure 42: amount of oil products sold, in mton.



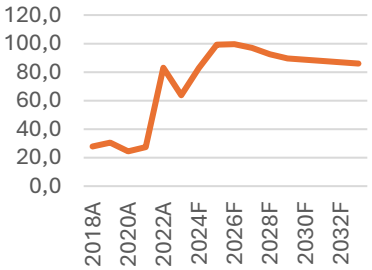
Source: Galp, own estimates

Figure 43: amount of natural gas sold, in TWh



Source: Galp, own estimates

Figure 44: evolution of natural gas prices, per MWh



Source: Eurostat, own estimates

For oil products, the determinant factors for revenues are the amount sold and selling price. To forecast the amount of oil products, we assumed that it would follow the demand growth of oil products in Europe, since Iberia is the prevalent market for this segment. According to the IEA, demand for oil and oil products in Europe should be decreasing until 2029 (IEA 2024). The progressive shift towards EVs as mentioned in the *Company Overview* is one of the reasons, along with lower industrial activity. According to the Eurostat, the EU's production of manufactured goods shrunk by 1.2% in 2023 (Eurostat 2024), and Oxford Economics forecasts that it further decreases by 0.7% in 2024 (Oxford Economics 2024). For reference, in 2022, industry use and road transport together comprised 67% of total oil consumption in the EU (Eurostat 2024). Given this scenario, we will forecast the amount of oil products sold by Galp will decrease at the demand rate forecasted by the IEA.

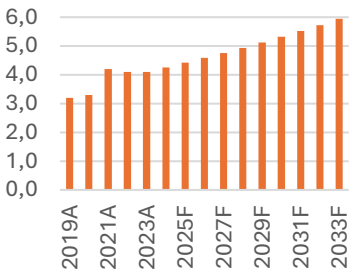
To forecast the average price of oil products sold, we assumed that it would grow at the same rate as the evolution of Brent crude oil prices, as forecasted for the upstream segment.

For natural gas revenues, the main drivers we selected were simply the amount sold and price. For the years prior to the forecast, the amount sold can be found for each year in Galp's report, while the reference for an average historical annual gas price was retrieved from the Eurostat, more specifically the average semestral gas price paid by non-households; we decided for selecting the price paid by non-households since most of the revenues are from the B2B segment. We then just annualized the average gas price paid by non-households in each year by calculating a simple average of the prices in the two semesters of each year.

To forecast the amount of natural gas sold, we decided to look at how consumption of natural gas is set to evolve in the industry and buildings, which are the primary clients of the Commercial segment. Regarding consumption in buildings, the EU is aiming to reduce fossil fuel usage in space and water heating by promoting heat pumps, as part of the RePowerEU plan, aiming to install 10 million additional heat pumps by 2027. Regarding consumption in industry, the IEA forecasts a reduction of 5 bcm in natural gas consumption in advanced economies based on their current policies[27], which represents only around 1.7% of total gas consumption in the EU in 2023[2]. Given this scenario, it seems likely that the amount of natural gas sold by Galp reduces until 2034, but at a very slow rate, which we will assume to be 0,2% each year.

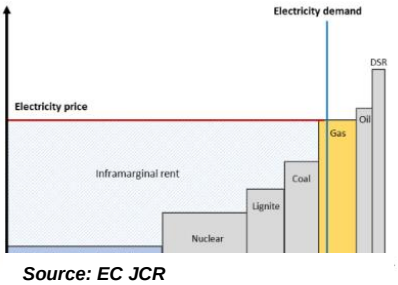
[2] According to Statista, natural gas consumption in the EU in 230 was 319,5 bcm.

Figure 45: amount of electricity sold, in TWh



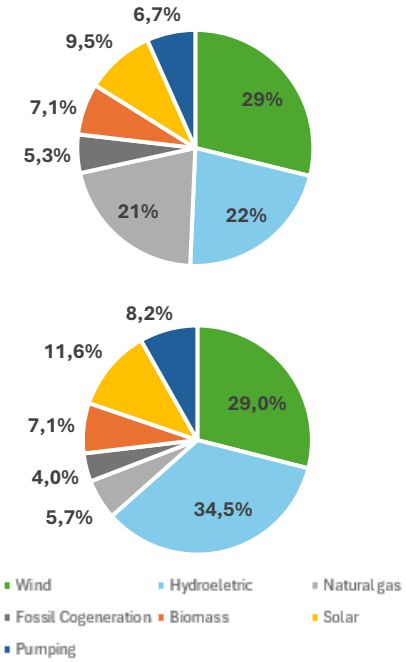
Source: Galp, own estimates

Figure 46: Simplified merit order supply demand stack



Source: EC JCR

Figure 47: Electricity generation by energy source, first 9 months of 2023 vs 2024 (up and bottom images, respectively



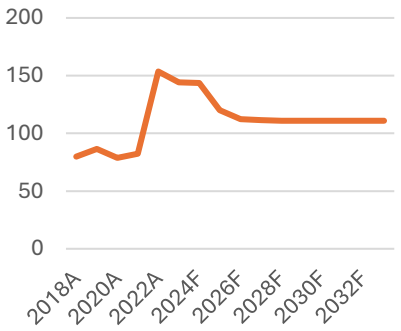
Source: APREN

For the prices of natural gas in each year of the forecast period, we started from the price in 2023 and then applied the growth rate implied by the futures prices of Henry Hub natural gas, as mentioned in the upstream forecast.

Regarding electricity sales, we distinguish between the transportation electricity sales, via the various charging stations that Galp has in Portugal and Spain, and the electricity sold to households and industries. We will forecast B2B and B2C electricity sales to evolve according to the IEA forecast for the total electricity generation in Europe.

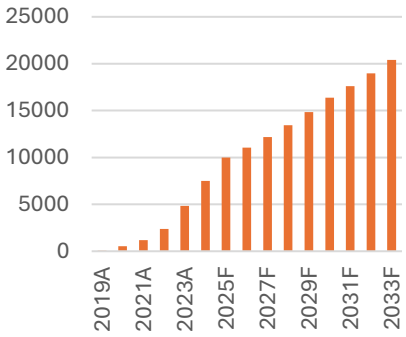
To forecast the electricity price, it is first important to understand how electricity prices are set in the EU. The way electricity prices are set is through a merit order mechanism (Gasparella, Koolen and Zucker 2023). Market sessions take place daily, where demand and supply of electricity are matched for each hour of the following day. In these sessions, producers place offers based on their marginal cost of generating electricity, which are then organized in an ascending order of price, such that bids at a lower price are dispatched first. The equilibrium price that is taken by all producers, regardless of their bid, is the intersection between supply and demand, which corresponds to the marginal cost of the last producer to meet the demand, also known as the market clearing price (Gasparella, Koolen and Zucker 2023). In Iberia, the market is called MIBEL, and the daily auctions are operated by OMIE. Fossil fuel based technologies will have the highest marginal costs, since the bids are driven mostly by the underlying commodity price, while renewable generators tipically have the lowest bids, since variable costs are close to zero, as their fuel is zero-cost natural inputs. One consequence of this system, is that often the marginal technology is the combined cycle natural gas plants, which sets the price for the whole electricity market (Gasparella, Koolen and Zucker 2023). A simulation conducted by the Joint Research Centre at the European Commission found that, in 2022, around 90% of the time, the price setting technology in Portugal was natural gas plants, despite only comprising around 40% of the generation mix. This makes it so that the electricity prices in the EU, and especially in the Iberian peninsula, are very strongly connected to the prices of natural gas. Until 2030 and beyond, as renewable capacity is expected to grow, this might put a downward pressure on electricity prices, while the overall expected increase in the demand for electricity might push the prices upward and require the dispatch of natural gas generators. For the first 10 months of 2024, we saw a much larger weight of renewable energy technologies in market closure compared to the same period of last year. In electricity generation, the total share of natural gas reduced from 27% to 6,5%, hydroelectric increased from 30% to 36,5%, and renewables, cogeneration and residues from 27% to 36,9% (APREN

Figure 48: evolution of electricity prices, per MWh



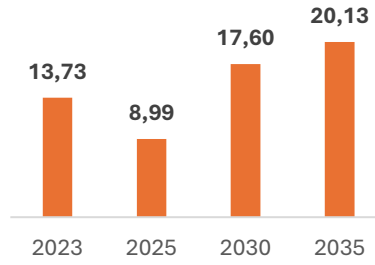
Source: Eurostat, own estimates

Figure 49: total number of charging points



Source: Galp, own estimates

Figure 50: ratio of BEV/PHEV cars in circulation to the total number of installed charging points in Portugal



Source: MOBI.E, DGEG, own estimates

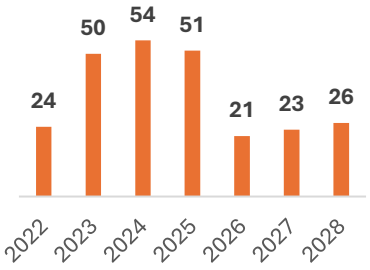
2023) (APREN 2024). The result of this was a much lower average MIBEL price for the period (92,7€/MWh in 2023 vs 52,8€/MWh in 2024, a 43% reduction). While this scenario might be partly due to unusual productivity of renewable technologies during the year, with the expected growth in renewable capacity that is anticipated and that was mentioned in the natural gas forecast, it's likely that lower energy prices become a trend. The market consensus seems to align, as MIBEL electricity futures prices are decreasing to 2034, and the same is true for markets in Italy, Germany and France (APREN 2024). We will, thus, estimate that electricity prices decrease yearly, at the rate implied by the MIBEL electricity futures market.

To estimate revenues from the charging station infrastructure, we selected 3 drivers: the number of EV charging points, the amount of energy supplied per EV charging point, and the average annual price of electricity. According to the latest annual report, Galp wants to target 10k charging points in 2025. Thus, we estimate that Galp installs 2673 more charging points to reach 7500 in 2024 and adds 2500 more to reach 10k in 2025. From 2025 onwards, we estimate that Galp will install charging points in such a way that it maintains the current position of market leadership in Portugal, a target that has been set by the company. A study published by Mobi.E, the authority responsible for overseeing the mobile infrastructure in Portugal, forecasts the amount of charging points necessary until 2050 to ensure growing demand is appropriately matched. To maintain market share, Galp will have to install charging points at a similar rate. The number of charging points forecasted by Mobi.E in 2030 implies a CAGR of 10%, and from 2030 to 2035, a CAGR of 9%[3]. We will estimate the total number of charging points installed by Galp to grow at these rates, until 2033.

To forecast the average revenue per EV charging point, we considered that this metric would be mostly dependent on the number of BEV/PHEV cars in circulation compared to the number of charging points available. A forecast published by DGEG, provides conservative and optimistic scenarios for future evolution of the freight of electric vehicles in circulation in Portugal[4]. We used this forecast to calculate a ratio of electric vehicles in circulation per charging point, combining the data provided by conservative scenario DGEG and Mobi.E. Finally, we calculated a CAGR of this ratio and assumed that revenues per charging point would increase at that rate.

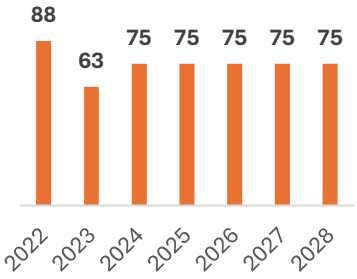
[3] According to MOBI.E, there were 10492 charging points in Portugal, as of December of 2024. The study forecasts 31972 charging points installed in 2030 and 46222 in 2035. A link to the study is provided in the references section.
[4] DGEG, "Relatório de Monitorização da Segurança de Abastecimento do Sistema Elétrico Nacional para o período de 2024-2040 (RMSA-E 2023)".

Figure 51: investment in charging points, in million €



Source: own estimates

Figure 52: investment in convenience store renovations, in



Source: own estimates

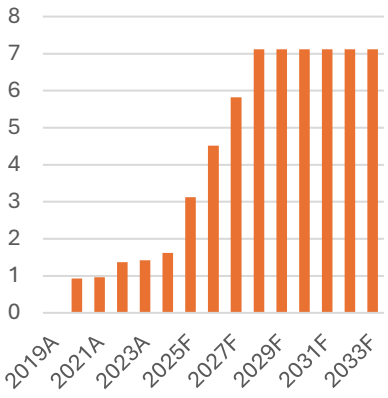
The capex investment in this segment will be mostly connected to convenience store renovations and EV charging point installations. In the last two annual reports, commercial capex reached c. 113m€ and c.111m€ in 2022 and 2023 respectively, with "business transformation" cited as the main driver for the investment, as the company looks to maintain a strong position in Iberia. According to Galp's last annual report, the company is trying to adapt its product offering to meet emerging demand trends, towards innovation and digitization, focusing on convenience and non-fuel offerings.

Aside from the convenience store renovations, the company will be investing in EV charging points. According to the MOBI.E forecast on the needed investment and charging points installation in Portugal to 2050, the average cost of a charging points installation in 20 thousand euros. To estimate the CapEx related to this invested, we multiplied this amount by the number of charging stations to be installed in each year.

To forecast total Capex for the segment, in 2022 and 2023 we subtracted from the total capex the value that we estimated to be the cost of installing the charging points, according to the previously mentioned method. The leftover amount in each year we assumed to be expenditures related to the renewal of convenience stores. We averaged those values and assumed that it would be the investment in the renewal of convenience stores until 2028, at 75 million a year. From 2029 onwards, we assumed that PP&E would be calculated as a percentage of revenues.

Renewables & New Business

Figure 53: total solar PV capacity installed, in GW



Source: Galp, own estimates

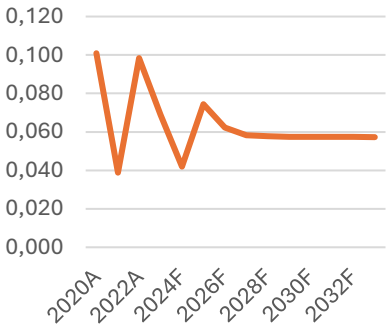
For valuation, we decided to forecast revenues using 3 main value drivers: total installed capacity, the capacity factor, and the electricity price. In the 2021 annual report, Galp targeted a generation capacity of 12 GW in 2030. Most recently, that target seems to have been retrieved, since it is not mentioned in the earliest reports. Galp also had a target of 4GW of capacity to be installed by 2025, which the company has already stated is "unlikely" to be met, citing the current high-interest rate environment and high costs as reasons for the slowed investment and imparity of some projects in Brazil, as well as delays in licensing, that have been slowing the beginning of operation of projects in Spain. We will still forecast a strong growth in production capacity, as currently Galp holds around 200 MW in construction Spain and another total of 5.5 GW of capacity currently under development. For 2024, the company is expecting 200 MW of capacity to be added. We will, therefore, assume no target for 2030, and assume that the 5,5GW that are in development will progressively enter in operation from 2025 to 2028. From 2029 onwards, we assume no further capacity additions.

Figure 54: estimated capacity factor by region, 2023

Region	Installed capacity (MW)	Capacity factor
Castile la Mancha	426	18%
Aragon	837	19%
Algarve	144	18%
Coimbra (wind)	12	31%
Total	**1419**	**19%**

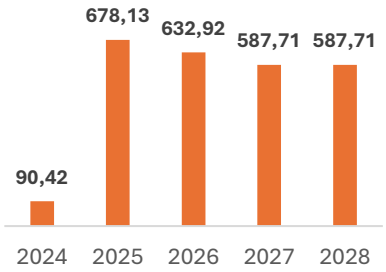
Source: PVGIS, renewables.ninja, own estimates

Figure 55: evolution of electricity price (€millions/GWh)



Source: OMIE, own estimates

Figure 56: evolution of CapEx, in million €



Source: own estimates

Forecasting the average capacity factor is complex, as this metric is going to depend on the timing of the deployment of new solar plants, as well as weather conditions, concerning solar irradiation, temperature, cloudiness, as well as the underlying technology of the solar panels themselves. We estimated the average capacity factor for 2024 based on the current projects in operation of Galp. For Solar PV plants, Galp currently operates in the regions of Aragon, Castile La Mancha, and Algarve, and each of these regions have particular weather conditions that result in a particular capacity factor. Using the PVGIS database, we calculated the annual electricity output based on the installed capacity in each of the regions, and with that data we calculated the capacity factor for each region.

Regarding electricity price, we will assume a forecast similar to the one conducted for the commercial segment. The latest quarterly report of Galp has reported a large decrease in the realised sale price for electricity from the PV plants, (79€/MWh vs 38 €/MWh, a 52% decrease) citing a higher penetration of hydro generation during the first half of the year as the cause, which is one of the causes for the lower average MIBEL price we analysed in the commercial section of the forecast. We will assume that Galp will end the year with an average realised price of 42€/MWh, implying that we expect a smaller penetration of renewable energy sources during the last quarter of the year, increasing the average price. From 2025 onwards, we assumed that electricity prices would equal those of the MIBEL futures.

Capex investment in renewables is intrinsically linked to the increases in renewable capacity that the company holds. Last year, the company inaugurated the first solar project of the company in Portugal, with a capacity of 144MWp, on an investment that amounted to over 70 million euros. Using this project as a reference for the necessary capex per MW of capacity installed, we will calculate each year's capex according to the amount of capacity we expect Galp to add each year. Given that part of the CapEx is spent on development on the so-called "soft costs", the capex each year that is associated with the capacity additions is discounting the soft costs that we assume have been incurred prior to the forecast. According to IRENA, soft costs in solar PV installations in Portugal and Spain amount to 7% (IRENA 2024). From 2029 onwards there are no further capacity increases, and kept capex at the level of depreciation, due to the low RONICs connected to further capacity increases. A more extensive discussion on this is on the *Terminal Growth* section.

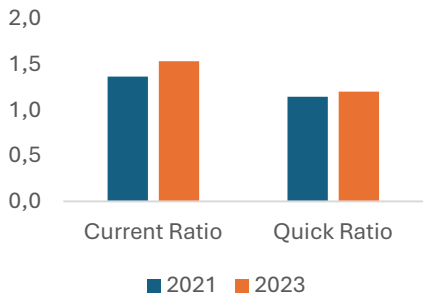
WACC

Galp's enterprise value was obtained through the Discounted Cash Flow (DCF) model. As we have mentioned before, due to the different nature and riskiness of each business unit, we decided to forecast each segment separately. In line with this approach, we think it is also more appropriate to use a different discount rate for each segment. In that sense, we evaluated each segment individually and summed the parts to get the total EV.

The first step to compute the wacc is to get the cost of debt. Our approach was to analyze the YTM of the company's traded bonds and then subtract by the product of probability of default and the loss given default. When looking at the company's traded bonds we observed that the bond with the longest maturity had a YTM of 3,65%. Moreover, to estimate the probability of default, we decided to look at the weighted global default rates by credit rating. However, since Galp is not currently rated by any credit agency, we had to estimate its credit rating. Our approach was to look at Galp's last known credit rating, which was in 2021, and to see whether the company's liquidity and solvency have improved since. To assess Galp's financial position, we looked at relevant financial ratios that credit rating agencies usually consider such as the current and quick ratio for liquidity and Debt/EBITDA, Debt/Equity and interest coverage ratio for solvency. Our starting point is 2021, when S&P last rated Galp at BBB-. In that sense, we compared the company's 2023 performance against the one observed in 2021. The liquidity ratios have shown a slight improvement. Similarly, the solvency ratios have also improved compared to 2021, with the D/EBITDA and D/E ratios decreasing more than 3 times and the interest coverage ratio nearly doubling. Taking all of this into account, we assumed that Galp is likely to have a credit rating better than the one observed in 2021 and we assumed it to be BBB. This is in line with the credit rating of some of Galp's peers who also trade at this rating (e.g. Repsol). Lastly, to compute the Rd, we also need the loss given default. We assumed the recovery rate to be 40% by looking at past years' recovery rates on defaulted corporate bonds which means that the loss given default would be 60%.

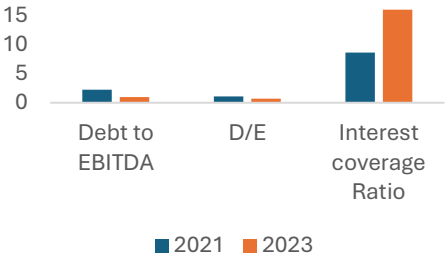
Furthermore, since we are evaluating each business unit separately, we need the cost of capital for each of Galp's segments. Keeping this in mind, our approach was to select comparable companies for each segment (Upstream, Industrial and Midstream, Commercial and Renewables) and get their betas by regressing their stock against STOXX 600, which we believe is a good proxy of the market. Since this companies have a different capital structure, we first had to un-lever their Betas and do an average of the unlevered betas for each segment to measure the risk of

Figure 57: Liquidity ratios



Source: own estimates

Figure 58: Solvency ratios



Source: own estimates

Figure 59: Cost of Debt parameters

Rd Estimation	
YTM	3,65%
L.G.D.	60%
P.D.	0,60%
Annualized P.D.	0,30%
Rd	3,47%

Source: Bloomberg and own estimates

Figure 60: Segment unlevered Beta and Unlevered cost of capital

Segment	βu	Ru
Upstream	0,42	4,98%
I&M	0,47	5,26%
Commercial	0,43	5,06%
Renewables	0,54	5,68%

Source: Own estimates

Figure 61: Galp's equity Beta vs weighted average Beta

Galp's Equity Beta	0,568
Standar deviation	0,246
Weighted average Beta	0,544

Source: Bloomberg and own estimates

each business unit excluding the influence of the capital structure. Then, to get the Ru, we applied the CAPM, using the German Government Bond as risk free rate and assuming a market risk premium of 6% as well as a target D/EV of 25%.

As an additional check, we compared Galp's equity beta of 0,568 with the weighted average equity beta derived from the various segments, which we calculated to be 0,544. This comparison helps us to assess whether the selected comparable companies and their betas provide are fair to evaluate Galp.

Terminal Growth

As part of our valuation of Galp, we computed the terminal value of the business segments of Galp, beyond the explicit forecast period from 2024 to 2033. We left the Upstream segment out of this analysis, since for that segment we had a different approach, extending the explicit period beyond 2033 and estimating the production yielded by the several upstream projects until 2056, when we believe the production ceases, as the last projects reach the end of their respective declining phases.

To compute the terminal value of the Refining & Midstream segment we used a perpetuity formula. To apply the formula, we estimate the UFCF growth rate "g" to be equal to -1,8%, which is the growth of the UFCF on last year of the explicit period.

The negative growth rate is representative of the declining trajectory of the industry, which revenues are dependent on the prices of oil, that are set to decrease over time as demand slows down as countries move away from fossil fuel usage and transportation becomes increasingly electrified. The numerator of the perpetuity formula was simply the FCF of 2034, computed as the FCF of 2033 growing at rate "g".

Figure 62: FCF growth in the last three years of the explicit period, R&M

	2031	2032	2033
FCF growth	-2,0%	-1,9%	-1,8%

Source: own estimates

Figure 63: perpetuity formula inputs and resulting terminal value, R&M

g	-1,8%
WACC	4,99%
FCF 2034	88,435
Terminal Value	**1298,69**

Source: own estimates

Figure 64: FCF growth in the last three years of the explicit period, Commercial

	2031	2032	2033
FCF growth	-1,9%	-1,9%	-1,9%

Source: own estimates

Figure 65: perpetuity formula inputs and resulting terminal value, Commercial

g	-0,25%
WACC	5,41%
FCF 2034	131,9
Terminal Value	**2329,65**

Source: own estimates

The terminal value calculation for the Commercial segment followed the same logic as the R&M segment, where we also applied the same perpetuity formula. In this case, the "g" was -1,9%, the growth rate of the UFCF on the last year of the explicit period forecast, which had during those three years always rounded to -2%. Reasons for the negative growth are the similar to those of the R&M segment, since revenues are mostly dependent on the sales of oil products, even though the effect of decreasing revenues from oil and natural gas are offset by the increasing sales of electricity. The NOPLAT of 2034 was computed similarly to the R&M case.

For the Renewables segment the same analysis was conducted, with the "g" equal

Figure 66: FCF growth in the last three years of the explicit period, Renewables

	2031	2032	2033
RR FCF Growth	-0,25%	-0,25%	-0,25%
	-0,24%	-0,25%	-0,25%

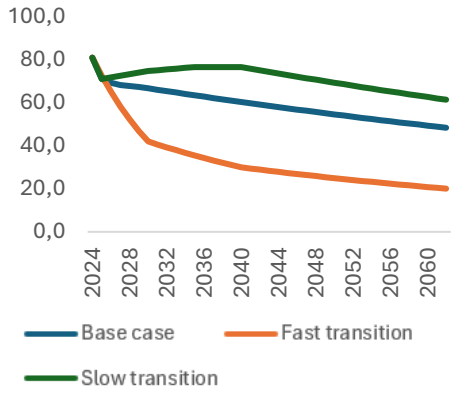
Source: own estimates

Figure 67: perpetuity formula inputs and resulting terminal value,

g	-0,25%
WACC	5,41%
FCF 2034	131,9
Terminal Value	**2329,65**

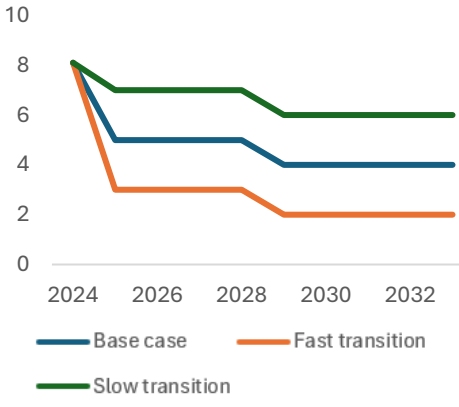
Source: own estimates

Figure 68: Brent crude oil price ($/boe)



Source: own estimates

Figure 69: Refining margins ($/boe)



Source: own estimates

to -0,25%, the last rate of UFCF growth for the segment. After keeping installed capacity constant after 2029, the declining rate of electricity prices brings the overall growth rate of UFCF to slightly negative levels. The weak observed RONICs when we assumed small increases in capacity after 2028, led us to

conclude that to keep investing, at that price point of electricity and capacity factor, would be value destructive, since the RONIC was below the WACC. Therefore, we assumed no further capacity increases, and that perpetually the evolution of the FCF should progress at the level observed for the last 3 years of the explicit period, which has stabilized.

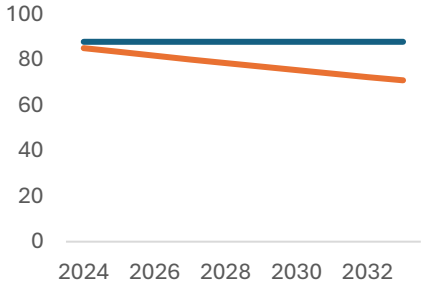
Scenario Analysis

With the scenario analysis, we are assessing how variations in oil demand impact our valuation of Galp. Beyond the base case that we have already explained, we also considered two other scenarios that account for different oil demand outcomes. On the one hand, we will consider a slow transition scenario where oil demand peaks later than we have anticipated. On the other hand, we will consider a fast transition scenario where oil will be substituted earlier than in the base scenario. The purpose of this analysis is to assess the outcomes in case we mis predict oil demand.

In the base scenario, as we previously discussed, we don't anticipate a significant variation in oil prices until the end of the decade. We project oil demand to rise until 2029, when it peaks, but, at the same time, we also project supply to rise. Overall, we anticipate that the supply increase will offset the demand increase and that is why we expect a gradual decline in brent prices by 2029 compared to 2024. In 2029, under this scenario, oil demand is projected to reach 105.6 mb/d and, from 2030 onwards, we expect oil prices to continue the downward trend. Under these circumstances, Galp's share price is expected to be €27,3.

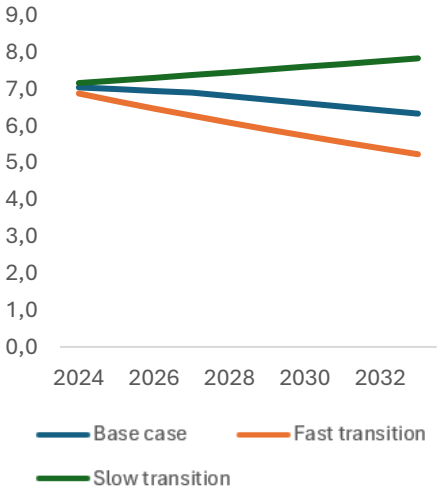
In the slow transition scenario, we expect oil demand to peak later than 2029. In this case, there will be a high demand for energy which will be met primarily by fossil fuels rather than renewable energy. We also anticipate oil demand to peak in 2039, 10 years later than in the base scenario. This is driven by increased demand for petrochemicals as well as growing energy needs in emerging markets, especially in Asia. We based ourselves on Goldman Sachs oil demand forecasts which, under slow transition circumstances, is expected to peak at 113 mb/d (Goldman Sachs 2024). After reaching peak, rather than a sharp drop, we expect a gradual decline on prices. Therefore, we adjusted our forecast accordingly. For the short term, we forecast the brent price to be equal to the one in the base

Figure 70: Volume of refined products (mboe)



Source: own estimates

Figure 71: Oil products sales in the commercial segment (mton)



Source: own estimates

scenario. However, for 2026 onwards, we projected a gradual increase in prices until oil demand reaches the peak, in 2040, after which we expect a slow decrease. As for Galp's refining operations, we don't expect a change in the total quantity of refined products compared to the base scenario because Galp is already operating close to full capacity in this scenario. However, we anticipate higher refining margins, in line with a higher demand for oil products. For the commercial segment, we anticipate Galp selling more oil products annually than in the base case. Under this scenario, Galp's stock price is €32.

Under the fast transition scenario, we anticipate a quicker substitution of fossil fuels with a rapid adoption of renewable energy sources. This scenario is based on the IEA's net zero emissions by 2050 which describes the energy sector's path to achieve net zero Co2 emissions by 2050 (IEA 2024). According to the IEA, this scenario can only be realized through significant changes in energy consumption patterns. First, electrification has an important role, as electricity can be converted into usable energy more efficiently than fossil fuels (e.g., electric vehicles are far more efficient than internal combustion engine vehicles) and a shift to electric power would significantly reduce overall energy consumption and waste. Second, another major factor in reaching this scenario is a consumer behavior shift to reduce energy use (e.g. fewer individual cars used and more public transportation). Under this scenario, oil demand is projected to drop from 97 mb/d in 2022, to 77 mb/d in 2030 and further 24 mb/d by 2050. Such a decrease in oil demand would have a huge impact on oil prices putting a downward pressure. IEA forecasts a price of $42 per barrel by 2030 and a price of $30 per barrel by 2050, respectively. Beyond the oil price, this scenario would also affect Galp's forecast by reducing the quantity of oil products sold in the commercial segment as well as the total volume of products refined, in the industrial and Midstream segment. Additionally, reflecting the reduced demand for oil products, refining margins are expected to decline. Under these specific circumstances, Galp's share price would be €17,3.

Sensitivity Analysis

The valuation of Galp is driven mostly by the upstream segment, which performance is dependent on the prices of oil. Moreover, the recent discovery of oil in the Mopane field of the Orange basin in Namibia has the potential to increase the valuation of Galp significantly as production starts, but will depend on the future recovery rates. Therefore, we analysed how the evolution of oil prices post 2030 and the recovery rate of oil in Namibia affect Galp's share price, ranging the recovery rates between 10% and 30%, to reflect historical variations of recovery

Figure 72: impact of oil price evolution and the recovery rate of Namibia on the share price

Namibia recovery rate \ Oil price growth after 2030	-2%	-1,5%	-1%	-0,50%	0%
30%	32,63	32,72	32,81	32,91	33,00
25%	29,90	29,98	30,06	30,14	30,22
20%	27,18	27,24	27,31	27,38	27,44
15%	24,45	24,51	24,56	24,61	24,67
10%	21,73	21,77	21,81	21,85	21,89

Source: own estimates

Figure 73: impact of the change in refining margins on share price

Refining margin	
3	27,24
4	27,27
5	**27,31**
6	27,35
7	27,39
8	27,43
9	27,46

Source: own estimates

Figure 74: impact of the perpetual growth rates of the Commercial and R&M segments on share price

g commercial \ g midstream	-0,81%	-1,31%	-1,81%	-2,31%	-2,81%
0,92%	27,75	27,67	27,59	27,53	27,47
1,42%	27,60	27,52	27,44	27,38	27,32
1,92%	27,47	27,39	27,31	27,25	27,19
2,42%	27,36	27,27	27,20	27,14	27,08
2,92%	27,26	27,18	27,10	27,04	26,98

Source: own estimates

rates of Galp's old projects, while also varying the range of the forecasted pace of the decline in oil prices after 2030. We can see on the table that the valuation is quite susceptible to changes in these assumptions. Even inside the narrower interval between 15% and 25% of recovery rate and -1,5% and -0,5% of oil price growth, we can see that the possible share prices vary between 24,51€ and 30,14€

For the Refining & Midstream segment, we conducted a sensitivity analysis on the possible future margins. While they should decrease with oil prices over the forecast period, the baseline value from which they start to decline, from 2025 onwards, is subject to a lot of uncertainty, and there is the possibility of future geopolitical instabilities further increasing these margins. As such, we ranged the refining margins between 3 and 9 €/boe. The margins were around 3€/boe in 2021, when the economy was recovering from the pandemic, and reached above 10 in 2022 with the war in Ukraine raising energy prices. Therefore, our selected range covers, at least historically, a wide range of possibilities concerning future shocks to refining margins. Despite this, future margins do not seem to impact Galp's share price significantly, only increasing the price by around 15 cents when we assume a margin of 9€/boe.

We also decided to conduct a sensitivity analysis on the estimated growth rates of both the commercial and refining and midstream segments, as there is uncertainty regarding the future path of cash flow growth. We kept the range between negative numbers, because they both represent declining industries, so future negative cash flow growth rates should be the norm in perpetuity. We see that there is only a small 44 cent increase in the share price when both rates approach -0.81% and -0,92%, in the most optimistic scenario, and a 33 cent decrease in the share price when both rates approach -3%. For a wide range of possible different values of g, we observe that the valuation does not change significantly.

Multiples Analysis

Due to the different nature of Galp's business units, we decided to conduct a multiple valuation for each segment. Each segment was evaluated independently, by choosing companies with similar characteristics.

Upstream

To perform the relative valuation for Galp's upstream segment, we used the EV/Revenues and the EV/EBITDA multiples. We began by identifying a group of companies which are primarily involved in the exploration and production of oil and

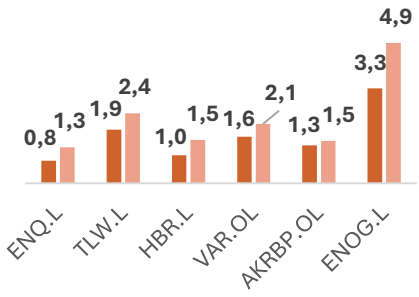
gas. The initial peer group consisted of Enquest PLC, Tullow Oil PLC, Harbour Energy PLC and Energean PLC, all based in the UK, as well as Aker BP and Var Energi, both based in Norway.

After defining the peer group, we analyzed each company's business operations to assess their suitability. After this review, we decided to exclude Energean PLC due to the composition of its reserves. Although it operates in the oil and gas exploration segment, Natural Gas represents 83% of total reserves, which makes it fundamentally different from Galp (Natural Gas represents 15% of total reserves) and the other peers, whose reserves are significantly more oil-weighted than Energean's. This difference likely explains why Energean's trades at a significantly higher multiple compared to the other peers.

Additionally, we also observed that Enquest PLC trades at a significantly lower multiples than the rest of the group. This is likely due to its low EBITDA margin, which averaged around 55% over the last 3 years, considerably below the levels observed by its peers. This underperformance is explained by the mature oil fields Enquest operates, particularly in the North Sea, which have higher production costs (Enquest production costs were 19,3 $/boe in 2023 while Galp had production costs were lower 3$/boe). Keeping this in mind, we also decided to exclude Enquest from the peer group.

After making these adjustments, the average EV/Revenues and EV/EBITDA of the peer group were 1,44 and 1.86, respectively. The implied EV for Galp's upstream segment is €4859 million based on the EV/Revenues and €4699 million based on the EV/EBITDA. These values are significantly lower than the ones obtained by the DCF. However, this difference is understandable given the nature of Galp's Upstream business. This segment is driven by projects with different stages of maturity, varying timelines, and resource availability. Galp's current revenues and EBITDA do not capture the future contributions of key projects still under development. For instance, the Bacalhau project will start the ramp-up period in 2025 and, once it reaches plateau production, is expected to add 40 kboepd to Galp's working interest production - equivalent to one third of its current production. This will result in a substantial boost to future revenues but is not yet reflected in the current results. Similarly, Galp's recent discovery in Namibia, with an estimated 10 bn boe of hydrocarbons in place, is another example of a long-term value driver that is not represented in the current financials. These factors highlight why a multiple valuation for an upstream segment like Galp's may underestimate its true value.

Figure 75: Company Multiples for the Upstream segment



Source: Refinitiv

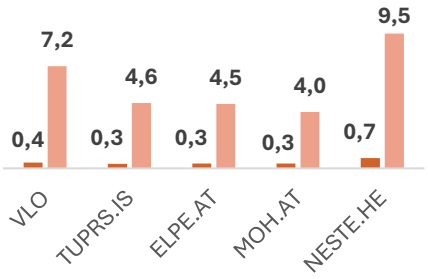
Figure 76: Implied EV for the Upstream segment

	EV/Revenue	EV/EBITDA
Avg. Multiple	1,4x	1,9x
Implied EV	4 859	4 699

Source: Own estimates

Industrial and Midstream

Figure 77: Company Multiples for the Industrial and Midstream segment



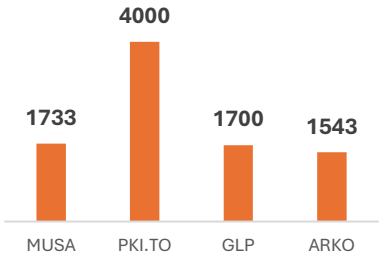
Source: Own estimates

Figure 78: Implied EV for the I&M segment

	EV/Revenue	EV/EBITDA
Avg. Multiple	0,3x	5,1x
Implied EV	2 595	4 550

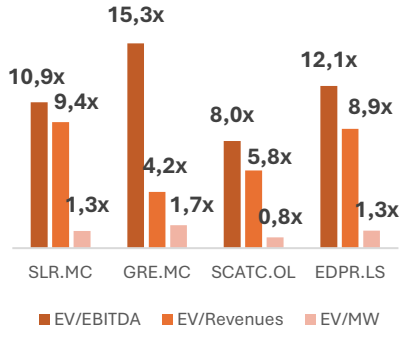
Source: Own estimates

Figure 79: Total number of gas stations by company



Source: Companies' reports

Figure 80: Company multiples, Commercial



Source: Refinitiv

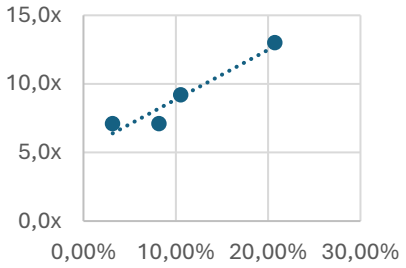
To value the Industrial and Midstream segment through relative valuation, we also started by selecting a peer group of companies primarily operating in the refining industry. The initial group included Valero (based in the USA), Turkiye Petrol Rafinerileri (Turkey), Neste (Finland) and Helleniq Energy Holding SA and Motor Oil Hellas (both based in Greece). We then analyzed each peer's operations to assess their suitability as comparable for Galp's I&M segment. Following this review, we decided to exclude Neste from the peer group. Neste's core business is significantly focused on its renewable products segment which includes renewable diesel, sustainable aviation fuel and other renewable solutions. In contrast, Galp's industrial and midstream segment primarily focuses on traditional oil refining and midstream activities. These operational differences, particularly Neste's strong emphasis on renewables, likely explain why Neste trades at a higher multiple than the other companies in the peer group which, similarly to Galp, also focus on traditional refining and midstream activities. After removing Neste from the peer group, we obtained an average EV/Revenues multiple of 0,3 and and EV/EBITDA multiple of 5,1. Based on these multiples, the implied EV for the I&M segment is €2595M using the EV/Revenues, and €4552M using the EV/EBITDA. We believe that the higher valuation implied by the EV/EBITDA multiples may be driven by the significantly improved EBITDA margin that the segment experienced, which was 2.5 times higher than the previous year.

Commercial

To evaluate the commercial segment, we selected 4 companies with its core business being the operation of convenience stores and gas stations, as well as fuel wholesale. We selected Arko, Global Partners LP, Parkland Corp. and Murphy USA. All of these are North American companies, since we could not find European companies whose core operations were this business line specifically. Dimension-wise, besides Arko, others have significantly higher revenues, despite operating a similar number of retail locations. Even though we are aware of these differences in size and geography, these are still good comparable companies in the sense that they share the same business line, characterized by high volume and low margins, facing similar future risks regarding oil price and demand.

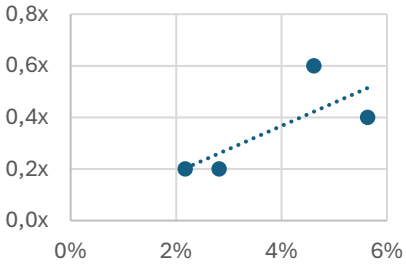
The driver of EV/EBITDA that we considered was the most relevant for this segment was the ROIC, as higher profitability should drive this multiple higher, as it increases confidence regarding future growth and indicates efficiency in turning revenues into profits. We can see that in our sample that relationship holds: Murphy USA has a much higher EV/EBITDA multiple than its counterparties at 13x and a much higher ROIC at 21% in 2023. Global Partners has a ROIC of 11% and

Figure 81: EV/EBITDA vs ROIC



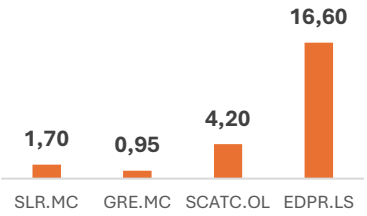
Source: Refinitiv, Bloomberg

Figure 82: EV/Revenues vs EBITDA Margin



Source: Refinitiv

Figure 83: Total installed capacity, in GW



Source: Companies' reports

Figure 84: Company multiples, Renewables

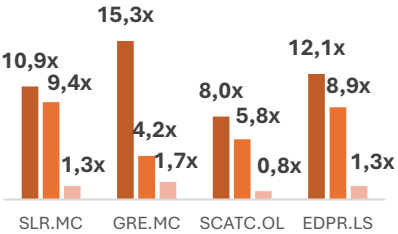
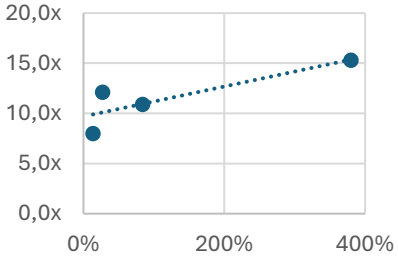


Figure 85: EV/EBITDA vs Under construction/Installed capacity



Source: Refinitiv, companies' reports

a multiple 9.2x. However, Arko has a ROIC of 3% and a multiple of 7.1x. The low ROIC of Arko comes from its convenience stores, which have shown major decreases in revenues because of consumer inflation. Recent news regarding intentions to sell this business have increased share price by 14%, explaining the high multiple despite the low ROIC.

For the EV/Sales multiple, in our sample, we identified that companies with higher EBITDA margins also have higher EV/Revenues multiples. Arko and Global Partners have smaller margins of 3% and 2% respectively and multiples of 0.2x, while Parkland and MUSA have margins of 6% and 5% and multiples of 0.4x and 0.6x, respectively.

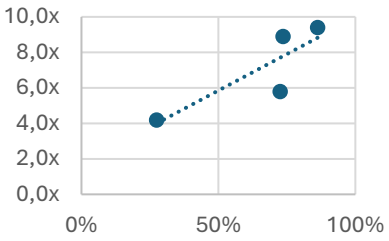
We also calculated an EV/Gas Stations multiple, resulting in an implied EV in line with the ones given by EV/EBITDA and EV/Sales. We excluded Murphy USA from the valuation using this particular multiple, which has a very high value driven by its high profitability, as it would probably overstate the value of Galp's commercial segment.

Renewables & New Business

To evaluate the renewables segment, we selected 4 companies with renewable electric energy generation from large utility scale solar and wind plants as a core business. Among the chosen, Solaria, EDPR and Grenergy have operations in Iberia, while Scatec does not. Geography matters in this case due to differences in electricity prices in different regions, with Iberia recording lower electricity prices during this year due to higher presence of renewables in the generation mix. We still decided to include Scatec, as they are an independent power producer (IPP) primarily of solar energy like this Galp segment, thus facing the same risks and with similar cash flow structures. Including only IPPs operating in Iberia would be too restrictive and would force us to choose companies with different segments beyond renewable electricity production. Solaria and Grenergy have similar installed capacity in comparison, while EDPR has significantly higher.

Regarding the EV/EBITDA ratio, we considered the projects in construction as a proxy for potential growth of the company, which in turn drives the EV/EBITDA multiple. In theory, companies with better growing opportunities should trade at higher EV/EBITDA multiples, and companies with better opportunities should be constructing proportionally more to capitalize on those opportunities. We can see that Grenergy has the highest EV/EBITDA multiple at 15.8x, while Scatec trades at 8x. Comparing the ratio for *capacity under construction / installed capacity*, this ratio is 13% for Scatec and 380% for Grenergy. For the EV/MW ratio, a sector specific multiple we created in which MW is the capacity installed in MW, the same

Figure 86: EV/Revenues vs EBITDA Margin



Source: Refinitiv

driver and analysis applies, with Grenergy having the highest value of this multiple at 1.71x and Scatec the lowest at 0.8x

We considered that the most relevant driver of the EV/Sales multiple to be the EBITDA margin, as the higher the margins, the higher each dollar of sales contributes to the profitability of the company and thus higher margins should translate into a higher revenue multiple. Grenergy has the lowest EV/Sales multiple at 4.2x and a EBITDA margin of 27%, while EDPR and Solaria have the highest multiples at 8.9x and 9.4x with margins of 74% and 86%, respectively.

Final Recommendation

Figure 87: DCF output

DCF Valuation (t0 =December 2025)	
Core levered EV (€M)	26609
Non Core Items (€M)	829
Net Financial Debt (€M)	6859,51
Equity Value (€M)	20579
# Shares outstanding (millions)	753
Share Price (€)	**27,31**
Dividend per share (€)	**0,58**

Source: Own estimates

The DCF valuation we conducted prices Galp's shares at 27,3€, as of the 31st of December of 2025. Despite the undervaluation observed by the comparable companies' valuation, that can be attributed to the smaller scale of operations of the peers identified for the Upstream segment, which lower multiples bring the valuation down, the DCF will be the basis for our recommendation as it addresses the fundamental value of Galp. The company is also expected to pay an annual dividend of 0,58$ per share at the end of 2025. Therefore, our recommendation is to **buy** Galp's stock, on which a total shareholder return of 64,1% is expected.

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Appendix

Appendix 1: Balance Sheet

Amounts in € millions	2018A	2019A	2020A	2021A	2022A	2023A	2024F	2025F	2026F	2027F	2028F	2029F	2030F	2031F	2032F	2033F
Core Business																
Operating Cash	687	663	455	645	1074	831	851	779	779	777	771	759	746	787	864	896
Accounts receivable	1630	1915	1658	2128	2406	2326	2559	2377	2435	2454	2443	2397	2350	2648	3194	3435
Inventories	1171	1055	708	1007	1361	1447	1325	1245	1267	1267	1251	1230	1203	1364	1665	1801
Income tax assets	0	0	101	139	3	0	0	0	0	0	0	0	0	0	0	0
Trade Payables	1973	2335	1413	2001	2872	3338	2948	2794	2854	2856	2821	2776	2715	3100	3820	4148
Net Working Capital	**1515**	**1298**	**1509**	**1918**	**1972**	**1266**	**1787**	**1607**	**1628**	**1642**	**1644**	**1610**	**1584**	**1699**	**1903**	**1985**
PPE and Right-of-use assets	5342	6848	5888	6255	6825	7663	7805	8394	9018	9645	9878	9648	9431	11191	14357	15789
Goodwill	85	85	85	85	70	44	71	65	63	62	61	60	59	58	57	56
Intangible Assets	539	569	524	636	665	655	604	774	821	881	957	946	938	930	922	914
Deferred tax assets	369	367	509	485	559	615	655	669	694	714	733	724	715	770	870	915
Other receivables	239	259	266	294	263	307	355	322	327	327	322	316	309	351	428	462
Other payables	126	121	112	95	99	95	134	120	118	116	115	113	112	111	111	110
Deferred tax liabilities	196	299	479	653	555	476	599	606	630	651	672	663	655	703	790	829
Provisions	658	819	1008	1209	1430	1437	1350	1229	1267	1273	1251	1224	1194	1412	1805	1981
Net Core Non-Current Assets	**5594**	**6889**	**5673**	**5798**	**6298**	**7276**	**7407**	**8268**	**8909**	**9590**	**9913**	**9693**	**9490**	**11074**	**13929**	**15217**
Core Invested Capital	**7109**	**8187**	**7182**	**7716**	**8270**	**8542**	**9194**	**9876**	**10537**	**11232**	**11557**	**11302**	**11075**	**12773**	**15831**	**17202**
Non-Core Business																
Financial Assets	334	343	592	1552	595	558	558	558	558	558	558	558	558	558	558	558
Loans to SINOPEC	176	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Investments in associates and joint ventures	1295	870	483	389	417	255	255	255	255	255	255	255	255	255	255	255
Non-current Assets held for sale	0	0	0	0	500	537	537	537	537	537	537	537	537	537	537	537
Post-employment and other employee benefit liabilities	304	332	381	300	251	225	225	225	225	225	225	225	225	225	225	225
Liabilities directly associated with non-current assets classified as held for sale	0	0	0	0	87	97	97	97	97	97	97	97	97	97	97	97
Derivative Financial Instruments	139	89	167	1205	421	199	199	199	199	199	199	199	199	199	199	199
Non-Core Invested Capital	**1362**	**792**	**527**	**436**	**753**	**829**	**829**	**829**	**829**	**829**	**829**	**829**	**829**	**829**	**829**	**829**
Total Invested Capital	**8471**	**8979**	**7709**	**8152**	**9023**	**9371**	**10023**	**10705**	**11366**	**12061**	**12386**	**12131**	**11904**	**13602**	**16660**	**18031**
Financial																
Short term Debt	559	460	705	1469	982	842										
Long term Debt	2685	3658	4127	4010	4282	4568										
Excess of cash	-820	-796	-1223	-1297	-1358	-1368										
Net Financial Debt	**2424**	**3322**	**3609**	**4182**	**3906**	**4042**	**6713**	**6860**	**6962**	**7072**	**7109**	**7018**	**6940**	**7191**	**7579**	**7518**
Total Equity	**6047**	**5657**	**4100**	**3970**	**5117**	**5329**	**3310**	**3845**	**4403**	**4988**	**5277**	**5114**	**4964**	**6410**	**9081**	**10512**
Total Funding	**8471**	**8979**	**7709**	**8152**	**9023**	**9371**	**10023**	**10705**	**11366**	**12061**	**12386**	**12131**	**11904**	**13602**	**16660**	**18031**

Appendix 2: Income Statement

Amounts € millions	2018A	2019A	2020A	2021A	2022A	2023A	2024F	2025F	2026F	2027F	2028F	2029F	2030F	2031F	2032F	2033F
Core and Recurrent Business																
Sales + Services Rendered	17182	16570	11381	16117	26840	20769	21268	19484	19484	19427	19287	18963	18657	19663	21605	22404
Other operating Income	141	368	186	325	321	442	361	337	368	375	364	352	338	471	709	817
Cost of goods sold	-12763	-12592	-8461	-11752	-20920	-14580	-15605	-14088	-13805	-13623	-13502	-13313	-13158	-13061	-13008	-12917
Supplies and external services	-500	-423	-296	-358	-537	-688	-278	-260	-282	-287	-279	-271	-260	-344	-517	-596
Employee costs	-321	-346	-356	-310	-370	-450	-446	-451	-459	-467	-475	-458	-453	-453	-459	-459
Other operating costs	-1414	-1360	-1333	-1317	-1439	-1725	-2035	-2010	-2086	-2125	-2126	-2090	-2037	-2350	-2919	-3173
D&A	-691	-979	-1289	-961	-1380	-987	-992	-998	-1008	-1046	-1092	-1089	-1060	-1031	-1256	-1662
Core and recurrent EBIT	**1634**	**1238**	**-168**	**1744**	**2515**	**2781**	**2273**	**2014**	**2212**	**2253**	**2176**	**2094**	**2026**	**2894**	**4155**	**4413**
Statutory taxes	-515	-390	53	-549	-792	-876	-716	-635	-697	-710	-685	-660	-638	-912	-1309	-1390
OCI	19	2	-3	25	-30	13	0	0	0	0	0	0	0	0	0	0
Core and Recurrent Result	**1138**	**850**	**-118**	**1220**	**1693**	**1918**	**1557**	**1380**	**1515**	**1543**	**1491**	**1434**	**1388**	**1983**	**2846**	**3023**
Non-Core and Core but Non-recurrent Business																
Earnings from associates and joint ventures	129	121	220	83	152	49	49	49	49	49	49	49	49	49	49	49
Other Financial Income (Expense)	-60	30	-44	-798	789	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6
Provisions	-5	-6	-114	-74	-133	-162	-162	-162	-162	-162	-162	-162	-162	-162	-162	-162
Non-Core and Core but Non-recurrent EBIT	**64**	**145**	**62**	**-789**	**808**	**-119**	**-119**	**-119**	**-119**	**-119**	**-119**	**-119**	**-119**	**-119**	**-119**	**-119**
Statutory taxes	-20	-46	-20	248	-255	37	37	37	37	37	37	37	37	37	37	37
Tax Adjustments	-264	-397	-365	-427	-498	-321	0	0	0	0	0	0	0	0	0	0
OCI	-57	1	-458	439	287	-154	0	0	0	0	0	0	0	0	0	0
Core but Non-Recurrent Result	**-277**	**-297**	**-781**	**-529**	**342**	**-557**	**-81**	**-81**	**-81**	**-81**	**-81**	**-81**	**-81**	**-81**	**-81**	**-81**
Total Core + Non-Core Result	**861**	**554**	**-899**	**691**	**2035**	**1361**	**1476**	**1299**	**1434**	**1462**	**1409**	**1353**	**1307**	**1901**	**2765**	**2942**
Financing Result																
Net Financial Costs	-10	-104	-142	-112	-76	-75	-157	-160	-162	-165	-166	-164	-162	-168	-177	-175
Tax shield	3	33	45	35	24	24	49	50	51	52	52	52	51	53	56	55
Financing Result	**-7**	**-72**	**-97**	**-77**	**-52**	**-51**	**-107**	**-110**	**-111**	**-113**	**-114**	**-112**	**-111**	**-115**	**-121**	**-120**
Total Comprehensive income	**854**	**482**	**-996**	**614**	**1983**	**1310**	**1368**	**1189**	**1322**	**1349**	**1296**	**1241**	**1196**	**1786**	**2644**	**2822**

Appendix 3: Cash Flow Statement

Amounts in € millions	2018A	2019A	2020A	2021A	2022A	2023A	2024F	2025F	2026F	2027F	2028F	2029F	2030F	2031F	2032F	2033F
Core and Recurrent EBIT	1634	1238	-168	1744	2515	2781	2273	2014	2212	2253	2176	2094	2026	2894	4155	4413
Notional Taxes	-515	-390	53	-549	-792	-876	-716	-635	-697	-710	-685	-660	-638	-912	-1309	-1390
Recurrent NOPLAT	**1119**	**848**	**-115**	**1195**	**1723**	**1905**	**1557**	**1380**	**1515**	**1543**	**1491**	**1434**	**1388**	**1983**	**2846**	**3023**
+Depreciation&Amortization	691	979	1289	961	1380	987	992	998	1008	1046	1092	1089	1060	1031	1256	1662
-Capex		-2485	-329	-1328	-1950	-1825	-1134	-1587	-1632	-1674	-1324	-859	-843	-2791	-4423	-3094
-Increase in Intangibles		-30	45	-112	-14	36	24	-164	-46	-58	-75	12	9	9	9	9
-Change in NWC		217	-211	-408	-54	706	-521	179	-20	-14	-2	34	26	-115	-204	-82
-Increase in Other Operating Assets		241	211	354	84	-176	-13	-109	29	5	-15	-22	-24	167	303	135
+Other non Cash Adjustments	19	2	-3	25	-30	38	0	0	0	0	0	0	0	0	0	0
Operating Free Cash Flow to the Firm		**-227**	**886**	**686**	**1139**	**1671**	**905**	**698**	**854**	**848**	**1166**	**1689**	**1616**	**285**	**-213**	**1653**
+ Non-operating EBIT	64	145	62	-789	808	-119	-119	-119	-119	-119	-119	-119	-119	-119	-119	-119
-Notional Taxes	-20	-46	-20	248	-255	37	37	37	37	37	37	37	37	37	37	37
- Tax Adjustments	-264	-397	-365	-427	-498	-321	0	0	0	0	0	0	0	0	0	0
- Change in other Assets		570	265	91	-317	-76	0	0	0	0	0	0	0	0	0	0
+Other non Cash Adjustments	-57	-5	-476	391	266	-186	0	0	0	0	0	0	0	0	0	0
Non-Operating Free Cash Flow to the Firm		**267**	**-534**	**-486**	**4**	**-665**	**-81**	**-81**	**-81**	**-81**	**-81**	**-81**	**-81**	**-81**	**-81**	**-81**
Total Free Cash Flow to the Firm		**40**	**353**	**200**	**1143**	**1006**	**824**	**616**	**773**	**766**	**1084**	**1607**	**1534**	**203**	**-294**	**1572**
-Interest	-10	-104	-142	-112	-76	-75	-157	-160	-162	-165	-166	-164	-162	-168	-177	-175
+ Income tax Shields	3	33	45	35	24	24	49	50	51	52	52	52	51	53	56	55
+Change in Net Debt		898	287	572	-276	136	2671	147	103	110	37	-92	-78	251	388	-61
+Transactions with Equity holders		-866	-543	-696	-815	-1091	-3387	-653	-764	-764	-1007	-1404	-1346	-340	28	-1391
Total Sources of Financing		**-40**	**-353**	**-200**	**-1143**	**-1006**	**-824**	**-616**	**-773**	**-766**	**-1084**	**-1607**	**-1534**	**-203**	**294**	**-1572**

Appendix 3: Segment Cash Flow Maps

Upstream

Amounts € millions	2018A	2019A	2020A	2021A	2022A	2023A	2024F	2025F	2026F	2027F	2028F	2029F	2030F	2031F	2032F	2033F	2034F	2035F	2036F	2037F	2038F	2039F	2040F
Core and Recurrent EBIT	1166	1003	479	1456	2237	1995	1842	1540	1720	1753	1649	1589	1521	2393	3658	3921	3614	2292	1937	2010	1924	1841	1761
Notional Taxes	-367	-316	-151	-459	-705	-628	-580	-485	-542	-552	-520	-501	-479	-754	-1152	-1235	-1138	-722	-610	-633	-606	-580	-555
Recurrent NOPLAT	**798**	**687**	**328**	**997**	**1532**	**1366**	**1262**	**1055**	**1178**	**1201**	**1130**	**1089**	**1042**	**1639**	**2505**	**2686**	**2475**	**1570**	**1327**	**1377**	**1318**	**1261**	**1206**
+Depreciation	306	532	686	563	719	404	584	600	611	625	649	624	604	580	808	1216	1402	1372	1005	809	777	746	717
-Capex		-1776	-70	-955	-463	-826	-714	-684	-722	-809	-456	-470	-411	-2360	-3994	-2667	-1167	1490	525	-559	-536	-515	-495
-Increase in Intangibles		-47	23	-98	63	21	8	7	7	7	7	7	7	7	6	6	6	6	6	6	6	6	5
-Change in NWC		-146	-164	90	-17	164	-79	91	-28	-8	15	17	12	-127	-215	-94	21	199	106	20	19	18	18
-Increase in Other Operating Assets		87	37	197	-10	-19	-70	-29	37	9	-14	-14	-18	165	294	134	-22	-264	-141	-23	-22	-21	-20
+Other non Cash Adjustments	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Operating Free Cash Flow to the Firm		**-663**	**840**	**795**	**1824**	**1111**	**990**	**1041**	**1084**	**1026**	**1331**	**1252**	**1236**	**-98**	**-596**	**1282**	**2716**	**4373**	**2827**	**1630**	**1561**	**1495**	**1431**

2041F	2042F	2043F	2044F	2045F	2046F	2047F	2048F	2049F	2050F	2051F	2052F	2053F	2054F	2055F	2056F	2057F	2058F	2059F	2060F	2061F	2062F
1685	1611	1541	1474	1409	1346	1287	1229	1175	1122	1071	1023	976	931	888	847	807	770	733	698	665	192
-531	-508	-485	-464	-444	-424	-405	-387	-370	-353	-337	-322	-307	-293	-280	-267	-254	-242	-231	-220	-209	-60
1154	**1104**	**1056**	**1009**	**965**	**922**	**881**	**842**	**805**	**768**	**734**	**700**	**668**	**638**	**608**	**580**	**553**	**527**	**502**	**478**	**455**	**131**
688	661	635	609	585	562	540	518	498	478	459	441	423	406	390	375	360	346	332	319	306	294
-475	-456	-438	-421	-404	-388	-373	-358	-344	-330	-317	-304	-292	-281	-269	-259	-248	-239	-229	-220	-211	844
5	5	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4
17	16	16	15	14	14	13	13	12	12	11	11	10	10	9	9	9	8	8	8	7	52
-20	-19	-18	-17	-17	-16	-15	-15	-14	-14	-13	-13	-12	-12	-11	-11	-10	-10	-9	-9	-9	-105
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1370	**1311**	**1255**	**1201**	**1149**	**1099**	**1051**	**1005**	**961**	**919**	**878**	**839**	**802**	**766**	**732**	**699**	**667**	**636**	**607**	**579**	**552**	**1220**

Industrial and Midstream

Amounts € millions	2018A	2019A	2020A	2021A	2022A	2023A	2024F	2025F	2026F	2027F	2028F	2029F	2030F	2031F	2032F	2033F
Core and Recurrent EBIT	21	-83	-871	172	230	767	127	85	118	121	125	123	124	123	123	121
Notional Taxes	-7	26	274	-54	-72	-242	-40	-27	-37	-38	-39	-39	-39	-39	-39	-38
Recurrent NOPLAT	**15**	**-57**	**-597**	**118**	**157**	**526**	**87**	**58**	**81**	**83**	**86**	**85**	**85**	**84**	**84**	**83**
+Depreciation	268	314	472	237	242	132	249	232	192	185	180	176	173	171	169	167
-Capex		-424	-240	-109	-296	-278	-187	-86	-167	-166	-167	-165	-164	-163	-163	-162
-Increase in Intangibles		4	15	-4	-24	-28	-3	-43	1	0	0	1	0	0	0	0
-Change in NWC		207	30	-350	-42	302	-236	94	10	4	-2	6	3	3	3	3
-Increase in Other Operating Assets		82	140	66	91	-75	35	-57	-5	-2	1	-3	-1	-1	-1	-1
+Other non Cash Adjustments	3	0	-1	4	-5	2	0	0	0	0	0	0	0	0	0	0
Operating Free Cash Flow to the Firm		**126**	**-180**	**-38**	**124**	**581**	**-55**	**199**	**112**	**104**	**98**	**99**	**95**	**94**	**92**	**90**

Comercial

Amounts € millions	2018A	2019A	2020A	2021A	2022A	2023A	2024F	2025F	2026F	2027F	2028F	2029F	2030F	2031F	2032F	2033F
Core and Recurrent EBIT	450	330	232	193	121	147	329	259	231	210	190	196	197	194	190	187
Notional Taxes	-142	-104	-73	-61	-38	-46	-104	-81	-73	-66	-60	-62	-62	-61	-60	-59
Recurrent NOPLAT	**308**	**226**	**159**	**132**	**83**	**101**	**226**	**177**	**158**	**144**	**130**	**134**	**135**	**133**	**130**	**128**
+Depreciation	74	88	91	102	194	132	73	79	83	85	86	88	81	80	78	77
-Capex		-147	146	-51	-279	-142	-130	-126	-97	-99	-101	-23	-67	-66	-65	-64
-Increase in Intangibles		4	16	-3	-15	7	-29	11	3	2	3	2	2	2	2	2
-Change in NWC		151	-48	-153	-118	263	-169	57	17	12	13	11	10	10	9	9
-Increase in Other Operating Assets		52	-21	22	-7	9	6	-15	-4	-3	-3	-3	-3	-2	-2	-2
+Other non Cash Adjustments	13	1	-2	17	-20	9	0	0	0	0	0	0	0	0	0	0
Operating Free Cash Flow to the Firm		**375**	**340**	**66**	**-162**	**378**	**-23**	**184**	**161**	**142**	**127**	**209**	**159**	**156**	**153**	**150**

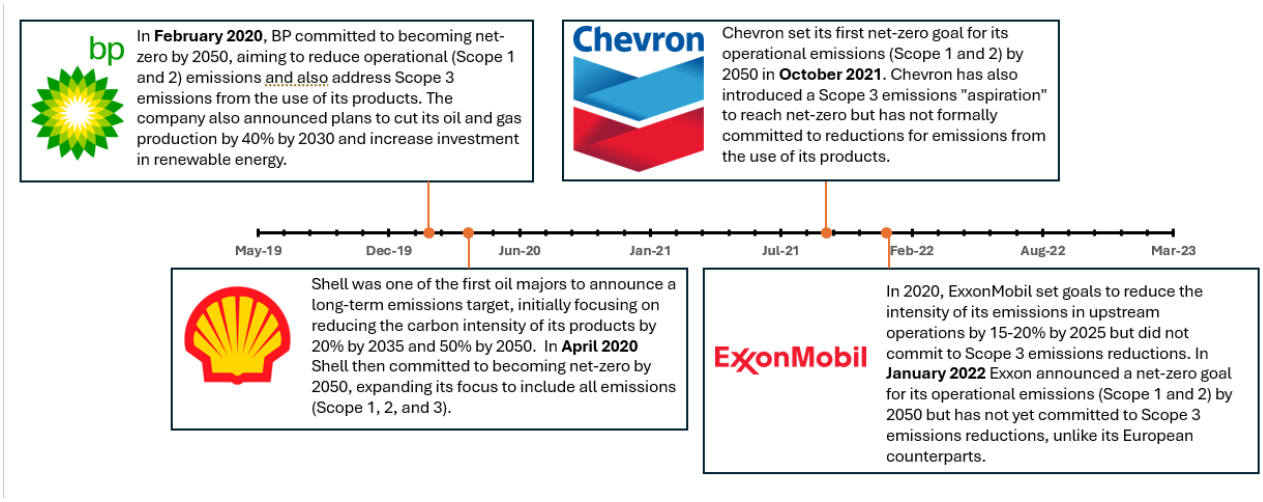
Renewables

Amounts € millions	2018A	2019A	2020A	2021A	2022A	2023A	2024F	2025F	2026F	2027F	2028F	2029F	2030F	2031F	2032F	2033F
Core and Recurrent EBIT		-6	-9	-14	32	20	-17	140	152	178	221	194	194	194	193	193
Notional Taxes		2	3	4	-10	-6	5	-44	-48	-56	-70	-61	-61	-61	-61	-61
Recurrent NOPLAT		**-4**	**-6**	**-10**	**22**	**14**	**-11**	**96**	**104**	**122**	**151**	**133**	**133**	**133**	**132**	**132**
+Depreciation		0	0	1	18	113	73	74	108	139	164	189	189	189	189	189
-Capex		-26	-164	-111	-834	-268	-90	-678	-633	-588	-588	-189	-189	-189	-189	-189
-Increase in Intangibles		-3	-18	-16	-85	-6	48	-192	-58	-68	-85	3	0	0	0	0
-Change in NWC		0	-3	0	33	-18	-39	-64	-19	-22	-28	1	0	0	0	0
-Increase in Other Operating Assets		0	0	4	-4	-5	7	3	1	1	1	0	0	0	0	0
+Other non Cash Adjustments		0	0	0	-1	0	0	0	0	0	0	0	0	0	0	0
Operating Free Cash Flow to the Firm		**-32**	**-192**	**-131**	**-851**	**-170**	**-13**	**-761**	**-496**	**-417**	**-383**	**136**	**133**	**133**	**133**	**132**

Others

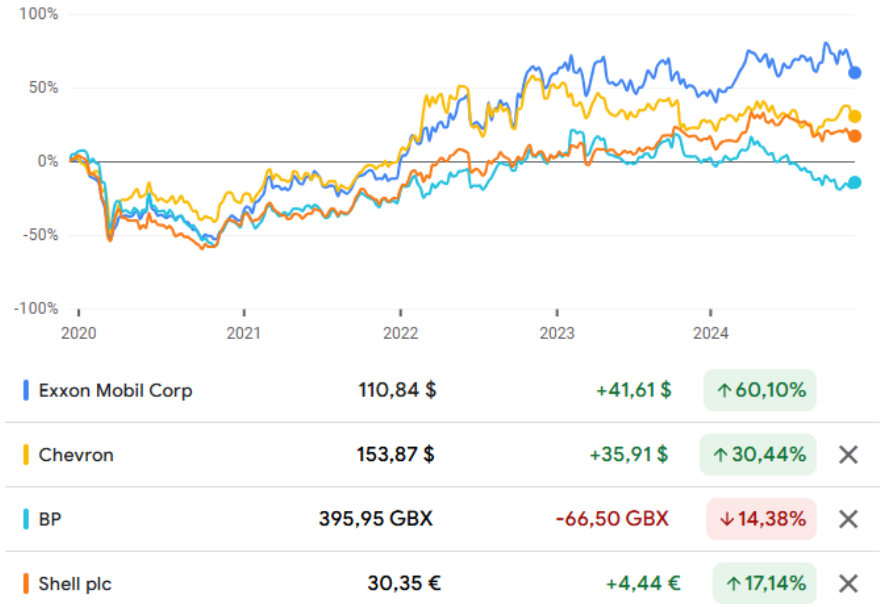
Amounts € millions	2018A	2019A	2020A	2021A	2022A	2023A	2024F	2025F	2026F	2027F	2028F	2029F	2030F	2031F	2032F	2033F
Core and Recurrent EBIT	10	5	8	-53	-58	-102	-9	-9	-9	-9	-9	-9	-9	-9	-9	-8
Notional Taxes	-3	-2	-3	17	18	32	3	3	3	3	3	3	3	3	3	3
Recurrent NOPLAT	**7**	**3**	**6**	**-36**	**-40**	**-70**	**-6**	**-6**	**-6**	**-6**	**-6**	**-6**	**-6**	**-6**	**-6**	**-6**
+Depreciation	7	8	12	14	21	28	13	13	13	13	13	13	13	13	13	13
-Capex		-75	26	-59	107	-134	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13
-Increase in Intangibles		1	3	0	2	-4	0	0	0	0	0	0	0	0	0	0
-Change in NWC		6	-26	5	89	-5	2	1	0	0	0	0	0	0	-1	0
-Increase in Other Operating Assets		20	55	64	14	-86	9	-11	0	0	-1	-2	-2	6	12	5
Operating Free Cash Flow to the Firm		**-37**	**76**	**-12**	**193**	**-271**	**5**	**-17**	**-6**	**-6**	**-7**	**-8**	**-8**	**0**	**6**	**-1**

Appendix 4: Net Zero Target Timeline



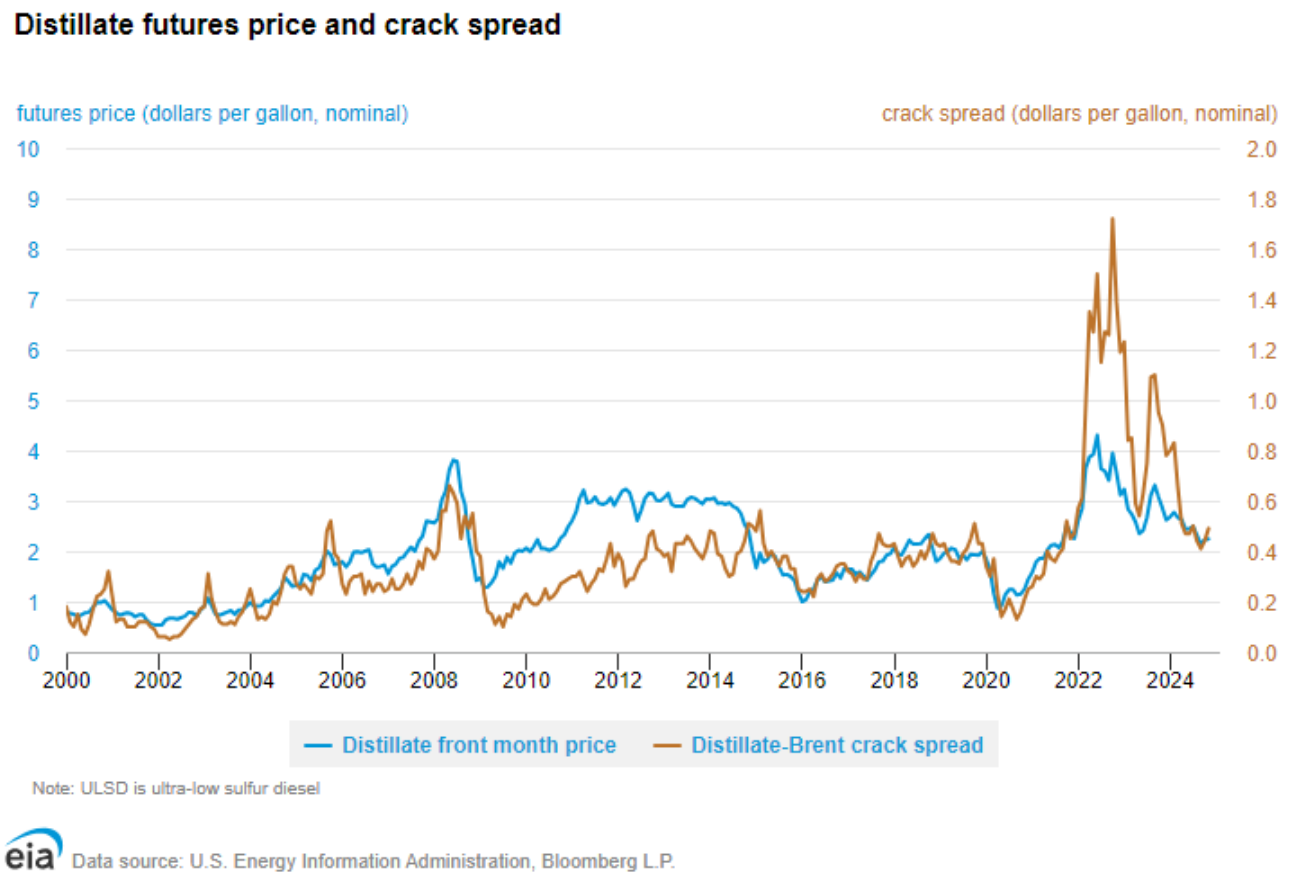
Appendix Figure 1

Appendix 5: Returns over 5 year period, ending December 14th 2024 (Google Finance)



Appendix Figure 2

Appendix 6: Distillate futures price and crack spread, EIA 2024



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Buy	Expected total return (including expected capital gains and expected dividend yield) of more than 10% over a 12-month period.
Hold	Expected total return (including expected capital gains and expected dividend yield) between 0% and 10% over a 12-month period.
Sell	Expected negative total return (including expected capital gains and expected dividend yield) over a 12-month period.

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