

A Work Project, presented as part of the requirements for the Award of a Master's degree in Finance from the NOVA – School of Business and Economics.

Field Lab – Equity Research

GALP ENERGIA, SGPS, S.A.:
A peaceful and sustainable future for the
energy industry

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Abstract

Hereby is a report written on a valuation performed on the share price of a security of a renown Portuguese competitor in the Iberian energy market, Galp Energia, SGPS, S.A.. The report contains a thorough description of the company, a brief historical contextualization on the main segments of the market in which the company operates, followed by a summarized description of the results found in the model built from the ground up. This part focuses on the valuation by multiples, the most out of the box valuation method.

The final recommendation is to **BUY** with the predicted price of the valuation model standing at 12.69 € at YE2022 and **12.76 €** at YE2023. The estimated share price is above the current one (**11.67 €**) with a **return** around **14%** on the security, also accounting for the dividend return of 0.75 €.

Keywords: Equity research; Valuation; Finance; Energy; Galp

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This report is part of the Galp Energia S.A. report (annexed), developed by Alexandre Costa Melo and Roberto I.L. Martins Costa and should be read as an integral part of it.

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Introduction

The energy market is a fascinating part of the financial world, notorious for its volatility and unpredictability. Even though Galp Energia S.A. (hereinafter referred to as “**Galp**” or “**The Company**”) is not only one of the main players in the global market, but also exhibits a familiar name, playing an important role in the Iberian energy market and establishes its presence onto several countries around the world. Consequently, the Company is affected by numerous factors, making it even so more challenging to model to. The differences in currencies, the state of the world that heavily affects the energy industry, the speculation surrounding energy securities in these hard times are all examples of these factors.

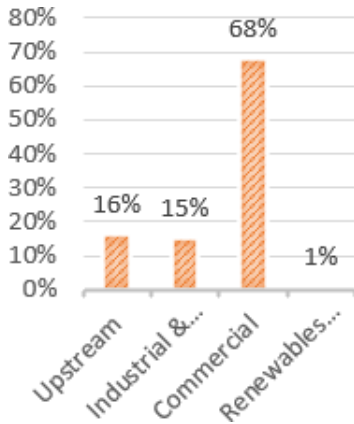
This report is built around the model, constructed specifically for this valuation. The model itself, however, is to be presented in the complete Company Report. In fact, this report focuses on the theoretical aspects that led to the assumptions made to construct the model.

The structure of this report is similar to the one of a paper, showing the theory behind the practice, consequently providing important insights and key aspects to have into consideration when making a decision not only concerning Galp’s security, but also most companies in the energy sector. A first, more theoretical part, will be showcasing the current state of the Company and the main projects that are being developed and that can most certainly bring value to the Company in the future. Thereafter, a brief contextualization on the global state of the market and the main closest events that influenced its present state, will be displayed. Secondly, the model itself will be presented. To start with, the sort of “out of the box” multiple valuation will be presented, as peer group is diverse and not focused only on one sector. Finally, this report will include the findings and main takeaways from this valuation type.

Company Overview

About Galp

Figure 1 - % of total revenue by sector 2022



Source I: Galp Energia S.A.

Galp Energia, SGPS, S.A. (“Galp” or the “Company”) was originally founded in April 1999 incorporating Petrogal and Gás de Portugal, with the goal of liberalizing the Portuguese oil and natural gas market. Since the date of its creation, the Company expanded operation throughout the world and performed multiple strategic acquisitions and established meaningful partnerships in order to strengthen its market position. Today, Galp counts with over 6,000 employees, has a direct presence in 10 countries under its operating model and exports to over 80 countries all over the world. The *modus operandi* of the Company is divided into 4 main segments: Upstream, Industrial & Energy Management, Commercial and Renewables & New Businesses. Galp operates in four continents and its main goal is set to “consistently adapt the business to the market by redefining the business model and the form of energy provided, through R&D and constant innovation”.

▪ Sectors and Main Projects

Figure 2 - Brazil project location

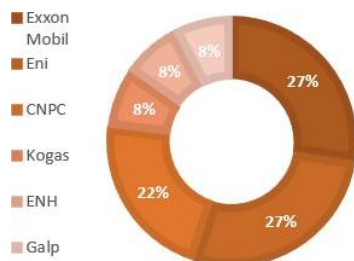


Source II: Galp Energia S.A.

The Company has been undertaking relevant projects in each segment that are adding value to the business as well as creating opportunities for the future.

In the Upstream sector, Galp has a strong presence in oil basins all over the Brazilian territory, primarily the Santos basin, which holds the largest known accumulation of oil and natural gas in ultra-deep waters. Despite being also explored by companies such as Shell, Total Energies, Qatar Petroleum, this basin is of immeasurable value to the Company, being explored since the year 2000. Other known ventures in Brazil include for instance the oil fields of Tupi, Ipanema, Berbigão / Sururu and Atapu. Among Galp’s most recent ventures within the upstream sector is the acquisition of 10% of the exploration rights for the Rovuma basin, an in-water exploration reserve of natural gas in Mozambique. The estimated CAPEX for this project is around 7 billion euros and the Company expects to capitalize on its size and on the quality of its resources. The Company predicts the construction and implementation of a liquefaction at a later stage in order to commercialize and export the commodity as Liquefied Natural Gas (“LNG”). This later stage, which is expected to start in the second half of the decade, allows Galp to offer a higher valued-added product to the market.

Figure 3 - Rovuma Basin Exploitation



Source III: Galp Energia S.A.

The Industrial & Energy Management sector focuses on the refining of raw materials, the logistics and the supply and trading activities of oil, gas, and electricity. Galp has a strong presence in the Iberian Industrial sector and has been more recently focusing on transforming the refineries to follow the trend of green energy around the World, in alignment with the Sustainable Development Goals

Figure 4 - Sines refinery yields 2021

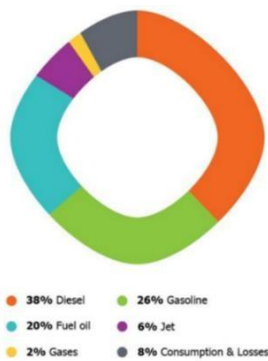
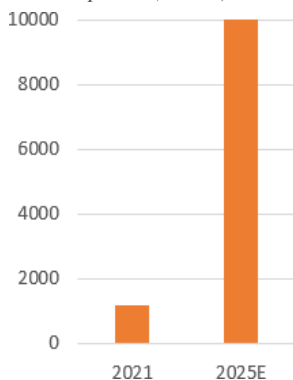


Figure 4 – Emission reduction plan for Sines



Source IV - Galp Energia S.A.

Figure 5 - Operating charging points (Iberia)



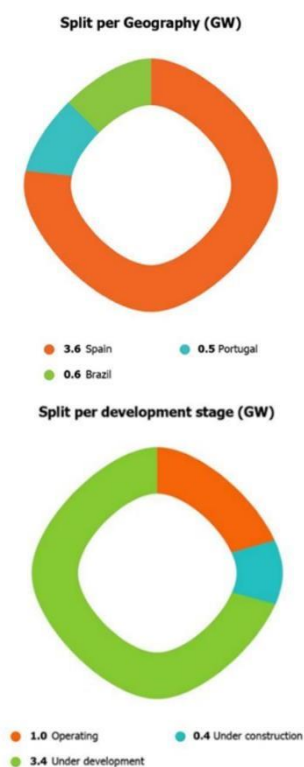
Source V - Galp Energia S.A.

for 2030 and the European Green Deal for 2050. For instance, the Company has been reorganizing the Sines refinery since 2017 in such a way that the emissions from its operations are expected to fall 50% by 2030. More specifically, the project is centred around the installation of an electrolyser for the production of green hydrogen to power the refinery and reduce considerably its carbon footprint. In addition to turning grey fuels more sustainable, Galp plans to expand the activity into maritime and aviation e-fuels. However, the project to acquire a 100 MW electrolyser has not yet matured, since it will require public support by European-wide subsidy plans to promote sustainable initiatives. Nevertheless, the Company approved the 1.8 mn € purchase of a 2 MW electrolyser, which is expected to start production in 2023. This was an alternative found by the Company to accelerate the learning curve in the fairly new hydrogen space and transition into the green energy goals of 2030. This business segment also includes the Company's activities in logistics and trading. Galp owns equity stakes in logistics and distribution companies, which increases its competitiveness and efficiency in supplying products. In 2020, Galp sold a 75.01% stake in Galp Gás Natural Distribution (GGND) to Allianz Capital Partners for 368 mn €, at an EBITDA multiple of 13x on this sale.

Regarding the Commercial sector, the Company offers both B2B and B2C options. Galp's presence in sales extends over to the Iberian region and Africa. The Company has relevant agreements with key partners in Portugal for its oil products, such as Sonae and TAP. Its customer base is often associated with loyalty to the Company and its values. In fact, in the Iberian retail segment, more than 40% of the oil product volumes sold are connected to loyalty programmes. With regards to the B2C segment, Galp is focused on the consumption of domestic electricity, as well as the sales from gas stations and convenience stores established across the Iberian region. In Spain, Galp is present in the natural gas and electricity market through a 25% stake in Podo, a digital company that developed AI technologies to facilitate transactions with consumers, such as invoicing. On the other hand, the B2B segment is characterized by sales of oil products such as fuels, chemicals and lubricants, natural gas, electricity, new energies and services to other companies and businesses. In this segment, the Company has about 21,000 customers of oil products and almost 10,000 customers of natural gas and electricity in Iberia, which are scattered through a variety of sectors such as distribution, transportation, marine bunkers, aviation, industry, services, public sector, and others.

The fourth and perhaps the most important sector moving forward is the Renewables & New Businesses sector. This sector revolves around the Company's commitments towards reducing the CO₂ intensity of the energy produced by 40% by the end of this decade and influencing the industry and market

Figure 6 - Gross Operating Capacity



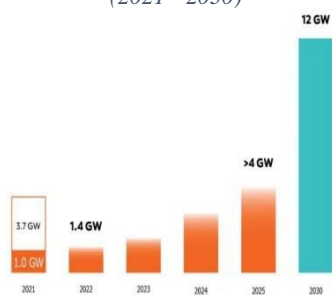
Source VI: Galp Energia S.A.

to follow the renewables trend for a more sustainable future. Sustainability and innovation are the keywords concerning this segment, as Galp continues its unceasing R&D allocated towards new renewable energy solutions. The Company focuses on the exploitation of solar energy but also owns ventures regarding wind-powered energy. Galp operates in projects in Portugal, Spain and, most recently, Brazil, that are mostly under development. The growth prospects for this are off the charts, since the Company expects to increase its operating capacity to 12 GW by the end of 2030, having now a total of 1 GW operating, 0.4 GW under construction and projects amounting to 3.4 GW under development (*Appendix Table 1*).

For this report, it is crucial to understand in depth how the Galp works and operates, the scope and scale of the projects currently under development, as well as the context of the markets in which it operates. Understanding these factors is of utmost importance and vital to building an accurate and dependable model, since they are the basis upon which the assumptions were made.

The next section will pinpoint the overall characteristics of each global market Galp is inserted in (Oil, Natural Gas, and Renewable Energy), in conjunction with the identification of the two most recent conjunctures that shaped these markets recently, namely the Covid-19 pandemic and the ongoing Russia-Ukraine War.

Figure 7 - Operating Capacity at YE (2021 - 2030)



Source VII: Galp Energia S.A.

Literature review

Energy market overview

It is of extreme importance for this report to understand the energy market and the trends that surround Galp in its activities over the last few years. Gathering this perception of the overall view and what has led to the energy market today, is crucial to make assumptions regarding the future of the market and, ultimately, the future of the Company.

- Oil prices historical evolution

It is impossible to do an overview on the energy market and not mention oil. Oil prices move the world's flow of action with their daily changes and their high volatility. Historically, many have argued the cyclicity of oil prices. However, the

past only proves its high volatility. In the past, two major ruptures in oil prices had occurred from 1970 to 1986 and from 1987 to 2020.

The first period was demarked between 1970 and 1986. In 1970, due to the War that broke down in the Middle East, oil prices surpassed the 10 USD barrier for the first time ever and exceeded the 20 USD mark when the Iran-Iraq war broke down at the end of 1978. Ultimately, there was a positive correlation between GDP growth rate and oil price fluctuations in this first period of oil price history. In fact, *Nan et al (2022)* defend that a 1% growth of the world economy is translated into, on average, a 5.7% increase in oil prices and that oil prices follow cycles of 6 to 7 years, on average. The plummeting in oil production led to the abnormal increase in oil prices, which ultimately led to the difficulty for the developed countries to deal with their deficits and a crisis emerged. Nevertheless, the 2008 crisis and the Covid-19 pandemic are the most recent examples of recessions that led to the eruption of oil prices to unprecedented values. In conclusion, the main reason for oil price volatility in this first period were geopolitical events (*Noguera-Santanella, 2016*).

The second moment occurred between 1987 and 2020, a period influenced by September 9th, 2001, and the attack to the Twin Towers in the United States. The period of extreme uncertainty and market speculation led to a huge increase in oil prices. This period, also marked by the oil workers' strike in Petroleo De Venezuela S.A. (PDVSA) and the war in Iraq, continued until around 2008 when WTI hit the record high price of 147.25 USD/barrel. In summary, a negative correlation can be established between oil prices and OPEC daily production in this most recent period of extreme volatility in oil prices.

Historical data shows that the average OPEC crude oil price, from a basket of crude oil different barrels, evolved from 1.21 USD in 1970 to 102.97 USD in 2022 (*Statista*). WTI crude oil evolved from 26.41 USD in 1970 to 81.19 USD in 2022 with an all-time high of 190.68 USD in June of 2008 (*MacroTrends*). The Brent crude oil evolved from 2.23 USD in 1970 to 85.79 USD in 2022, with an all-time high of 147.5 USD observed in July 2008 (*Trading Economics*).

Figure 8 - Crude oil price (1980 - 2022)

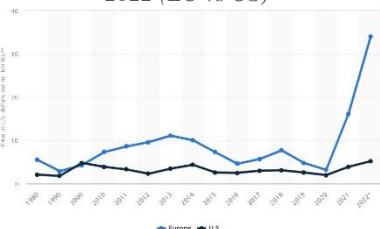


Source VIII: Trading Economics

- Natural gas market overview

Contributing a high percentage of Galp's revenue, the natural gas industry and its history are matters of high interest for this valuation. Despite being mostly explored in Brazil (*Campos et al, 2017*) by the Company, the industry started being explored and commercialized in the United Kingdom in the 18th century and substituted the so then called "town gas" in the 1960's. However, it was in the United States that

Figure 9 - Natural gas prices 1980 - 2022 (EU vs US)



Source IX: Statista

the industry matured and modernized, since it surpassed all other countries in the production and consumption of natural gas (*Tussing & Barlow, 1984*).

Historically, the evolution of natural gas' prices has always followed the trend of oil prices, which led some to consider them to be substitutes (*Brown & Yucel, 2008*). Additionally, they can also be seen as complements and rival goods (*Joutz & Villar, 2006*). Nonetheless, more recent studies show that natural gas can affect countries' economies by itself, demystifying the previous statement that it was dependent on the evolution of oil prices (*Naqvi et al, 2022*). An article written by *Sonnichsen* in Statista in April 2022, shows the evolution of natural gas prices in Europe and in the United States between the years of 1980 and 2022 (measured in U.S. dollars per million British thermal units). European prices evolved in an increasing trend (*Acaravci et al., 2012*) starting in 5.5 in 1980, followed by a sharp decrease to 2.9 in 1990, continuously increasing until the 2013 when it peaked at 11.1, followed by yet another sharp decrease until 3.2 in 2020, only to boom in the following years closing at an outstanding amount of 16.1 in 2021 and being around 39 in more recent statistics. The United States were able to maintain its prices within a good range, showing to be less volatile than the Europe ones. In 1980 it was of 2.1, surpassing the European ones for the first and only time in history in the year 2000 with 4.8. Afterwards, it entered a decreasing trend until it reached a price of 2 in 2020. Finally, it abnormally increased in the last 2 years to 3.9 in 2021 and surpassing the barrier of 6 in 2022.

Figure 10 - Crude oil (blue) vs Natural gas (orange)



Source X: Trading Economics

The differences in prices between the US and Europe can be explained by the fact that the production capacity of the United States has always been way superior and have had better access to natural gas exploitation tools, devices, and conditions than European countries. Regarding the price evolution itself it was, following the trend of oil prices, heavily affected by geopolitical incidents that occurred over the years. The most remarkable one, Covid-19, led the prices to plummet in 2020, due to a shortage in demand which was then quickly followed by a supply side shortage as the world economy was trying to recover, causing the prices to explode. In fact, the expectation for the future is for prices to continue to increase due to the negative impacts of the Russia-Ukraine war that started in 2022.

- Renewable market overview and the future of energy

These days the renewables market is well established, known for its innovative and sustainable practices, and, for some, a solution in the fight against fossil fuels and their history of pollution and destruction. Furthermore, the Sustainable Development Goals are coming to the final decade to meet its objectives for 2030, which helps boost this industry within the next years.

Figure 11 - Renewable energy as a % of gross final energy consumption



Source XI: Eurostat

In the United States the renewable energy market size was estimated to be of 768.9 billion USD in 2021, with an estimated CAGR of 15.1% between 2020 and 2030, showing the huge growth potential of the market. Solar and wind power energy sources are the most prominent among the renewable energy sources (insert image). The European Union has the primary objective to become the world's first climate-neutral continent by 2050, as agreed in the European Green Deal, an accord formulated in 2019. A 2020 update reveals the importance given to this agreement, since the only country belonging to the Union that did not meet the criteria was France. Most countries were overachievers on the consumption of renewable energy as a percentage of gross final energy consumption. (*Appendix - Image 1*)

It is defended by literature that the European Union is divided into two groups – the first group is composed by countries that have the highest employment rates in the renewable energy sector as a fraction of full employment and a well-developed renewables sector overall - in what concerns the production and usage of renewable energy for electricity consumption (*Frodyma et al., 2019*). It is defended by the authors that these countries have more propensity to consume electricity obtained from renewable sources.

Other papers defend the positive impacts of renewables in the most developed countries of Europe such as Germany (*Rafindadi & Oztur, 2017*). However, some earlier papers, show a more conservative view defending that there is no correlation whatsoever between GDP growth and the amount of renewable energy consumed ⁽²⁰⁾⁽²¹⁾⁽²²⁾ as it seems a controversial and well debated subject by the community.

Nevertheless, the fast growth that was witnessed these past decades, also encounters limitations as in the possible saturation of the renewables market, due to the strategic placement it brings companies and the flexibility of innovation (*Asknes et al., 2017*). Besides, a feeling of retraction is exposed in some investigators, since a high share of renewables in the energies companies' portfolios around the world may come to much different results with unpredictable effects for the market (*Anaya & Pollitt, 2016*).

All in all, the impact of this sector is undeniable in the world we live in and the potential for its growth, complying with all the Sustainable Development Goals, the EU goals for 2050 alongside many others' objectives to be conquered, cannot be ignored.

- **Covid-19 impact**

Aside from the other downturns and major shocks in the world's economy, in order to potentially have a more accurate view towards the future of the industry it is

important to study the effects of the most recent world economic downturn, the Covid-19 pandemic.

The energy market resented the Covid-19 pandemic, with the crude oil prices dropping down from 50% to 80% in the first quarter of 2020. Moreover, oil prices reduced 10% at that time and oil futures such as WTI and Brent dropped, on average, 20% for the first time since they have been around in the energy market (*Shaikh, 2022*). The difficulties felt on the supply side of the production chain led to companies shutting down their production, since they revealed to be unable to meet neither their production requirements nor their fixed costs in a sustainable way (*Fu & Shen, 2020*). Nevertheless, some authors believe that energy demand was also heavily affected as its average growth rate within the main regions of the world plummeted in about 6.2% in 2020. In this paper, it is also argued that demand was more affected during extreme lockdown measures, improving when the measures started being lifted (*Jiang et al. 2020*)

However, authors defend that the household energy demand has increased as well as the potential for the use of energy from renewable sources, which allowed the industry to sustain within the pandemic.

Regarding the first, *Kawka & Cetin (2021)* defend that despite studies showing an overall decrease in electricity demand, household electricity demand has shown an increase of 30% during the pandemic in the U.S. The study performed had shown a higher electricity use during the day, when people used to be out at work. Consequently, morning electricity peaks were replaced by late afternoon peaks and data usage increased 47% in the U.S. from 2019 to 2020 mostly allocated to streaming services, remote work applications, social media and gaming. Moreover, there was a higher use of household appliances as well as an increased amount of energy usage from solar panels during the day. Household energy represented around 38% of total energy use and during the pandemic increased, in some states, around 8.9–12.4%, such was the case of California. Europe followed the same trend where the decrease in overall energy demand was fuelled by a reduction in the commercial loads in the big cities, in spite of the increase in household consumption. During the pandemic, around midday in the UK, household energy consumption increased by 30%. As a consequence, household electricity billing increased substantially in the stay-at-home regime during the peak of Covid-19. (*Li et al. 2021*).

On its hand, the renewable energy market was also heavily affected by the pandemic since the end of the first quarter of 2020. Although Covid-19 delayed multiple green emissions projects around the world and several renewable energy stations ceased operating during that period, it also brought benefits to the cause. During the pandemic, daily global CO₂ emissions fell by approximately 17% in

April 2020, compared to the previous year, and decreased around 8% when compared to the levels of 2010 (*Kuzemko et al. 2020*). It is important to notice that this reduction occurred due to the ceasing of most operations, such as factories shutting down and surface transports being used to the minimum with the new restrictions. Indeed, the overall market growth on renewable energy was of -13% from 2019 to 2020, according to the International Energy Agency (IEA). Nevertheless, the Covid-19 pandemic has shown the potential of the development of this industry for the global economy and the raising impact of not only the growth of developed countries in the main regions of the world, but also of the emerging regions, such as Asia, Latin America and sub-Saharan Africa where the conditions are more and more met to the development of renewable energy projects.

In summary, the Covid-19 pandemic affected harshly the energy market overall with special attention on the plummeting of the non-renewable energy sources prices. Despite the loss in value registered in the electricity and renewables market, there were some positive aspects that show the potential of the industry moving forward, in what concerns the increase in household energy consumption (possibly in a hybrid work model developed by companies) alongside the increased awareness raised towards renewable energy sources, reducing the CO₂ emissions, aligned with the 2030 agenda and the sustainable development goals.

- **Russia-Ukraine War impacts**

The Russia-Ukraine War that started earlier this year in the month of February, is the main influencer of the behaviour of oil and natural gas prices nowadays, as well as the emergence of renewable energy and its affirmation in the energy market (*Stephen & Patt, 2022*).

In a recent study conducted by *Isaac Appiah-Otoo (2022)*, performed to check any sort of relationship between the War and the raise in oil prices in the United States, a causal relationship between the two variables was found. Following the same trend, as already mentioned in the literature, the European market also saw its prices skyrocket, as the War retired multiple supply chains as well as the discontinuance of most relationships with Russia. This discontinuation of supply chains is a serious problem that affects multiple key markets around the world, not only the energy market, but also all sorts of raw materials and primary goods (*Dinh et al., 2022*)

Furthermore, the stock market suffered quite a bit with the flourishing of the War. Through a paper investigating the impact of the Russia-Ukraine conflict on the stock market efficiency of six developed countries, the market efficiency hypothesis is rejected, and the authors expose the predictability of the decrease in asset prices in times of instability, especially in what concerns geopolitical affairs (*Bonacim et al, 2022*).

Ultimately, this armed conflict brings a lot of uncertainty to the World and surely its effects will continue to unravel during the next months. The already visible ones show a sharp increase in energy commodity prices, alongside the increasing urgency for renewable energies to step up in order to put a tone to the dependency on fossil fuels.

In sum, the literary work on Galp's future projects and operations are important to infer on possible red flags or value creation opportunities. In fact, it seems as if the Company will have a lot of openings to increase its value through the projects it is developing, specially concerning renewables. As previously mentioned, the solar energy market is the fastest growing among the renewable energy sources, bringing immense potential for the future projects directed at the expansion of the Company's productive capacity in the sector.

Another relevant point exposed by the literature concerns the fact that the energy market is expected to calm down, turning to a positive trend in the next few years as the Russia-Ukraine War effects start to dilute. Thus, there might be some openings regarding the calming of the effects on oil and natural gas prices, which can improve the efficiency of the Upstream sector.

On one hand, the Company expects to meet exceptional numbers in the capacity of energy to be produced via renewable sources, which despite not being their main source of revenue, could very much become so a few years from now. This assumption takes into account the fact that the world is changing, and renewable energy sources are slowly but surely taking over fossil fuels in the energy market. On the other hand, there is a feeling of change around the energy market. The uncertainty and high speculation brought by Covid-19 and confirmed by the Russia-Ukraine armed conflict made it such that investors are now considering their options, eager to jump in, thinking that the market could not get any worse than this. As a consequence of this mindset, and as the effects of these geopolitical events wear off, investors expect the market to improve within the next decade, increasing the prospects of energy enterprises and their respective share prices. In summary, both of these reasons align perfectly with the incentives of Galp, since the Company has plans to expand its operations and is already outperforming under times of uncertainty and pressure from external sources.

in the next few years as the effects of the Russia-Ukraine War start to dilute. Thus, there might be some openings regarding the calming of these effects on oil and natural gas prices, which can improve the efficiency of the Upstream sector. However, it is crucial to notice that these comments are merely speculative and based on past comments and/or from reliable sources presented above. The energy market has proven itself to be extremely uncertain and volatile and will certainly remain as such.

Multiple valuation and peer analysis

▪ Peer choice

In addition to the previous cash flow-based valuation methods, in order to explore the full value creation potential in the global markets, a valuation through multiples was performed. Even though Galp operates mostly in the Iberian region, it exports to more than 80 countries around the world. Therefore, it is only natural to speculate on the ability of the Company to match its global peers and not solely the European ones. In order to appropriately compare Galp with its peers in the global energy market, those must first be sorted by Enterprise Value and Market Capitalization.

The diversified offer of enterprises brings positive and negative aspects to the valuation. On the one hand, the valuation is harmed by the fact the companies are too dispersed geographically and operate in different areas of the globe. Furthermore, the operating activities and the core business of the companies may differ or have only a few aspects in common, which may also hinder the valuation.

On the other hand, considering a wider geographical area allows for Galp to have a more diversified peer group, which unlocks the full potential of the Company in a scenario where it expands worldwide. It is a bold, unorthodox but unbiased peer group choice that shows a different view. There is always a confirmation bias built around the peer group choice, since it is often to restricting to the Company's geography, EV, market capitalization, operating market, sector, among other factors. Indeed, when choosing the defining factors of the peer group, investors look for what they already know to be true, not exploring different options.

The main constituents of the peer group prepared for the valuation of Galp are: Southwestern Energy CO and Washington H. Soul Pattinson in North America, Raizen SA and Empresas Copec SA in South America, China Merchants Energy, Adaro Energy Indonesia and Idemitsu Kosan CO LTD in Asia Pacific, and VAR Energi and Polski Koncern in Europe.

▪ Analysis

The valuation was performed around 3 main multiple types: the EBITDA multiple (EV/EBITDA), the EBIT multiple (EV/EBIT) and the Price-to-Earnings multiple (P/E). The minimum, maximum, median and average values of each multiple were then extracted from the peer group. This use of different sets of multiples provides a range of results, each of which allows for different conclusions regarding Galp's price per share.

Table 1 - Multiple Valuation

	max	median	min	avg
EBITDA Multiple	16,135	14,796	13,187	11,936
EV/EBITDA	829	39,715	37,667	1,735
Price per share	19,46	17,84	15,90	14,39
EBIT Multiple	2,09	1,00	47,89	45,42
EV/EBIT	19,003	15,832	13,395	10,862
Price per share	2,742	1,420	65,312	56,879
P/E	22,52	19,09	16,15	13,30
Price-to-Earnings Multiple	3,31	1,71	78,76	68,59
P/E	13,927	7,731	12,567	6,976
Price per share	3,352	1,861	32,188	17,867
P/E	16,79	9,32	15,15	8,41
Price per share	4,04	2,24	38,89	21,50

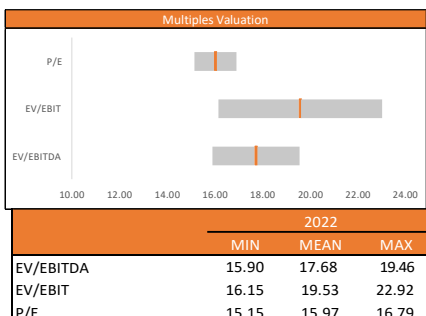
Source XII: Own Valuation Model

For the sake of completeness, the analysis was done using the results expected from 2022 as an accurate predictor for current price, as well as the financial results from 2023 to estimate the potential growth of the company in one year.

On the one hand, adopting the minimum values of the peer group would be unsustainable for the Company, since the share price would drop close to 0 considering certain multiples as, for instance, the EV/EBITDA and the EV/EBIT. On the other hand, the maximum value would grossly overvalue the stock price compared to its current levels, which is extremely unlikely considering the current operating capacity of the Company. Hence, these brackets are not reasonable estimators of the fair value of the company.

On the other hand, the results from using the average or median values were much closer to current market price and would even indicate a clear undervaluation of the stock, since stock prices would range from 15.15 € to 22.92 € for 2022. However, these multiples indicate a very steep fall in equity value in 2023 – by at least -8.3% and as high as -44.5%.

Still, even though a decrease in valuation between 2022 and 2023 is seen across the board, the share price at all valuations for 2023 achieved through EBITDA and EBIT multiples would be above the current market price – 14.39 € and 13.10 €, respectively. The only valuation multiple that would place Galp below current levels is the P/E since strong revenues growth during the period cause a large increase in the foreseen debt servicing expenses, which directly affect the net profit.



	2022		
	MIN	MEAN	MAX
EV/EBITDA	15.90	17.68	19.46
EV/EBIT	16.15	19.53	22.92
P/E	15.15	15.97	16.79

	2023		
	MIN	MEAN	MAX
EV/EBITDA	17.84	16.12	17.84
EV/EBIT	13.10	16.10	19.09
P/E	8.41	8.87	9.32

GALP ENERGIA SGPS, S.A.

COMPANY REPORT

ENERGY SECTOR

10 JANUARY 2023

ALEXANDRE COSTA MELO & ROBERTO I.L. MARTINS COSTA

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Redesigning the Energy Market

A fresh start towards a sustainable future

- A green and sustainable future is what Galp has been fighting for over the last few years. With multiple projects undergoing to expand the capacity of its renewables portfolio, **the Company has a positive feeling regarding the returns from this sector for the near future. Prospects to increase the operating capacity of this sector to 4GW in 2025 and 12GW in 2030.**

- Some concerns rise as the Russia-Ukraine War brought **uncertainty** upon the energy market. Crude oil and natural gas prices exploded and supply chains were discontinued. **The Upstream sector is important for Galp, is being affected and could bring efficiency problems,** despite the transition to renewable energy.

- The **commercial sector is expected to rise in the % of revenue** due to the prospects of the Company to add over 10000 charging points throughout Iberia.

- The acquisition of 10% of the Rovuma basin, in Mozambique, **increased the operating capacity of the company.** A successful venture that will continue to create value to the company.

- Core FCF** of the Company are **underwhelming**, despite the upward prediction of **1,093 mn € for 2022. Core ROIC** shows value creation potential from new projects being almost **4x higher than WACC.**

Company description

Galp Energia SGPS SA is a portuguese energy company operating in the Iberian energy market divided into 4 sectors: Upstream, Industrial & Energy Management, Commercial and Renewables & New Businesses. Although widely known for its African and South American ventures of oil and natural gas exploitation, the Company has been widening its portfolio towards a more green and sustainable future throughout different renewable energy sources.

Recommendation: BUY

Price Target FY23: 12.73 €

Price (as of 16-Dec-22) 11.79 €

Reuters: GALP.LS, Bloomberg: GALP

52-week range (€)	8.06-13.06
Market Cap (€m)	9,777.8650
Outstanding Shares (m)	829.251
Share Price Appreciation	8.0%
Total Share Return	14.3%

Source: Yahoo Finance

Galp vs .PSI20



Source: Reuters

(Values in € millions)	2021A	2022E	2023F
Revenues	16,111	27,575	29,547
EBITDA	2,751	3,875	3,759
Net Profit	389	1,936	993
EPS	0.47	2.33	1.20
P/E	1704	7.81	9.81
Core FCF	312	1,093	-18
Core ROIC (%)	14.11	28.78	14.19
ROE (%)	21	51	27

Source: Galp Annual Report and Valuation model

THIS REPORT WAS PREPARED EXCLUSIVELY FOR ACADEMIC PURPOSES BY ALEXANDRE COSTA MELO & ROBERTO IGREJAS LOPES MARTINS COSTA, 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)

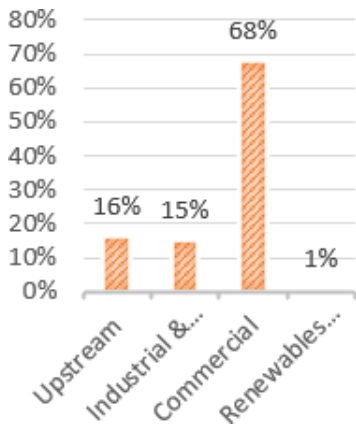
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Company Overview

About Galp

Figure 1 - % of total revenue by sector 2022



Source I: Galp Energia S.A.

Galp Energia, SGPS, S.A. (“Galp” or the “Company”) was originally founded in April 1999 incorporating Petrogal and Gás de Portugal, with the goal of liberalizing the Portuguese oil and natural gas market. Since the date of its creation, the Company expanded operation throughout the world and performed multiple strategic acquisitions and established meaningful partnerships in order to strengthen its market position. Today, Galp counts with over 6,000 employees, has a direct presence in 10 countries under its operating model and exports to over 80 countries all over the world. The *modus operandi* of the Company is divided into 4 main segments: Upstream, Industrial & Energy Management, Commercial and Renewables & New Businesses. Galp operates in four continents and its main goal is set to “consistently adapt the business to the market by redefining the business model and the form of energy provided, through R&D and constant innovation”.

Sectors and Main Projects

The Company has been undertaking relevant projects in each segment that are adding value to the business as well as creating opportunities for the future.

In the Upstream sector, Galp has a strong presence in oil basins all over the Brazilian territory, primarily the Santos basin, which holds the largest known accumulation of oil and natural gas in ultra-deep waters. Despite being also explored by companies such as Shell, Total Energies, Qatar Petroleum, this basin is of immeasurable value to the Company, being explored since the year 2000. Other known ventures in Brazil include for instance the oil fields of Tupi, Ipanema, Berbigão / Sururu and Atapu. Among Galp’s most recent ventures within the upstream sector is the acquisition of 10% of the exploration rights for the Rovuma basin, an in-water exploration reserve of natural gas in Mozambique. The estimated CAPEX for this project is around 7 billion euros and the Company expects to capitalize on its size and on the quality of its resources. The Company predicts the construction and implementation of a liquefaction at a later stage in order to commercialize and export the commodity as Liquefied Natural Gas (“LNG”). This later stage, which is expected to start in the second half of the decade, allows Galp to offer a higher valued-added product to the market.

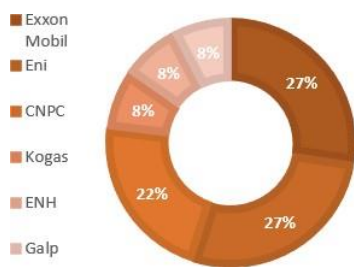
The Industrial & Energy Management sector focuses on the refining of raw materials, the logistics and the supply and trading activities of oil, gas, and electricity. Galp has a strong presence in the Iberian Industrial sector and has been

Figure 2 - Brazil project location



Source II: Galp Energia S.A.

Figure 3 - Rovuma Basin Exploitation



Source III: Galp Energia S.A.

Figure 4 - Sines refinery yields 2021

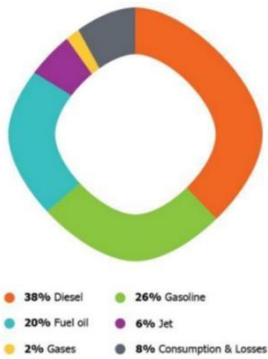
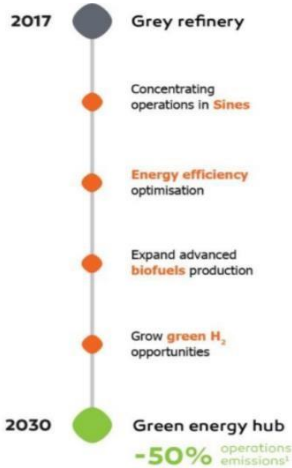
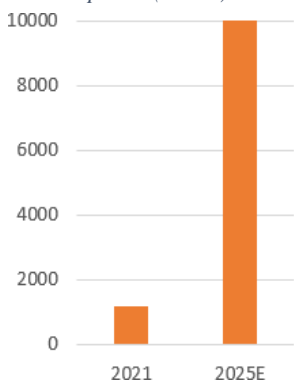


Figure 4 – Emission reduction plan for Sines



Source IV - Galp Energia S.A.

Figure 5 - Operating charging points (Iberia)

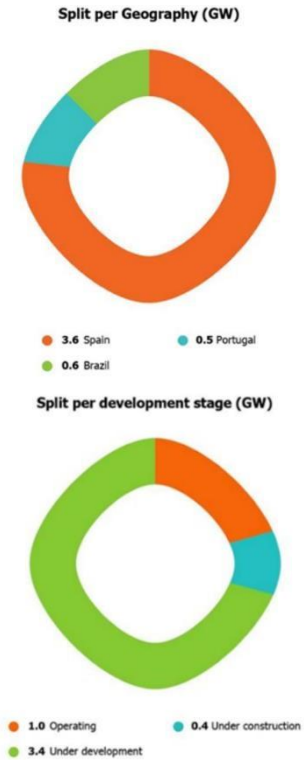


Source V - Galp Energia S.A.

more recently focusing on transforming the refineries to follow the trend of green energy around the World, in alignment with the Sustainable Development Goals for 2030 and the European Green Deal for 2050. For instance, the Company has been reorganizing the Sines refinery since 2017 in such a way that the emissions from its operations are expected to fall 50% by 2030. More specifically, the project is centred around the installation of an electrolyser for the production of green hydrogen to power the refinery and reduce considerably its carbon footprint. In addition to turning grey fuels more sustainable, Galp plans to expand the activity into maritime and aviation e-fuels. However, the project to acquire a 100 MW electrolyser has not yet matured, since it will require public support by European-wide subsidy plans to promote sustainable initiatives. Nevertheless, the Company approved the 1.8 mn € purchase of a 2 MW electrolyser, which is expected to start production in 2023. This was an alternative found by the Company to accelerate the learning curve in the fairly new hydrogen space and transition into the green energy goals of 2030. This business segment also includes the Company's activities in logistics and trading. Galp owns equity stakes in logistics and distribution companies, which increases its competitiveness and efficiency in supplying products. In 2020, Galp sold a 75.01% stake in Galp Gás Natural Distribution (GGND) to Allianz Capital Partners for 368 mn €, at an EBITDA multiple of 13x on this sale.

Regarding the Commercial sector, the Company offers both B2B and B2C options. Galp's presence in sales extends over to the Iberian region and Africa. The Company has relevant agreements with key partners in Portugal for its oil products, such as Sonae and TAP. Its customer base is often associated with loyalty to the Company and its values. In fact, in the Iberian retail segment, more than 40% of the oil product volumes sold are connected to loyalty programmes. With regards to the B2C segment, Galp is focused on the consumption of domestic electricity, as well as the sales from gas stations and convenience stores established across the Iberian region. In Spain, Galp is present in the natural gas and electricity market through a 25% stake in Podo, a digital company that developed AI technologies to facilitate transactions with consumers, such as invoicing. On the other hand, the B2B segment is characterized by sales of oil products such as fuels, chemicals and lubricants, natural gas, electricity, new energies and services to other companies and businesses. In this segment, the Company has about 21,000 customers of oil products and almost 10,000 customers of natural gas and electricity in Iberia, which are scattered through a variety of sectors such as distribution, transportation, marine bunkers, aviation, industry, services, public sector, and others.

Figure 6 - Gross Operating Capacity



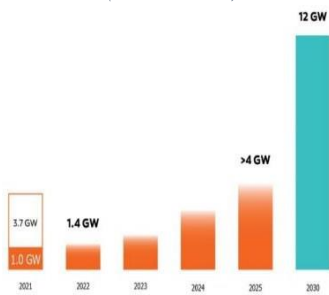
Source VI: Galp Energia S.A.

The fourth and perhaps the most important sector moving forward is the Renewables & New Businesses sector. This sector revolves around the Company's commitments towards reducing the CO₂ intensity of the energy produced by 40% by the end of this decade and influencing the industry and market to follow the renewables trend for a more sustainable future. Sustainability and innovation are the keywords concerning this segment, as Galp continues its unceasing R&D allocated towards new renewable energy solutions. The Company focuses on the exploitation of solar energy but also owns ventures regarding wind-powered energy. Galp operates in projects in Portugal, Spain and, most recently, Brazil, that are mostly under development. The growth prospects for this are off the charts, since the Company expects to increase its operating capacity to 12 GW by the end of 2030, having now a total of 1 GW operating, 0.4 GW under construction and projects amounting to 3.4 GW under development (*Appendix Table 1*).

For this report, it is crucial to understand in depth how the Galp works and operates, the scope and scale of the projects currently under development, as well as the context of the markets in which it operates. Understanding these factors is of utmost importance and vital to building an accurate and dependable model, since they are the basis upon which the assumptions were made.

The next section will pinpoint the overall characteristics of each global market Galp is inserted in (Oil, Natural Gas, and Renewable Energy), in conjunction with the identification of the two most recent conjunctures that shaped these markets recently, namely the Covid-19 pandemic and the ongoing Russia-Ukraine War.

Figure 7 - Operating Capacity at YE (2021 - 2030)



Source VII: Galp Energia S.A.

Literature review

Energy market overview

It is of extreme importance for this report to understand the energy market and the trends that surround Galp in its activities over the last few years. Gathering this perception of the overall view and what has led to the energy market today, is crucial to make assumptions regarding the future of the market and, ultimately, the future of the Company.

- Oil prices historical evolution

It is impossible to do an overview on the energy market and not mention oil. Oil prices move the world's flow of action with their daily changes and their high volatility. Historically, many have argued the cyclicity of oil prices. However, the past only proves its high volatility. In the past, two major ruptures in oil prices had occurred from 1970 to 1986 and from 1987 to 2020.

The first period was demarked between 1970 and 1986. In 1970, due to the War that broke down in the Middle East, oil prices surpassed the 10 USD barrier for the first time ever and exceeded the 20 USD mark when the Iran-Iraq war broke down at the end of 1978. Ultimately, there was a positive correlation between GDP growth rate and oil price fluctuations in this first period of oil price history. In fact, *Nan et al (2022)* defend that a 1% growth of the world economy is translated into, on average, a 5.7% increase in oil prices and that oil prices follow cycles of 6 to 7 years, on average. The plummeting in oil production led to the abnormal increase in oil prices, which ultimately led to the difficulty for the developed countries to deal with their deficits and a crisis emerged. Nevertheless, the 2008 crisis and the Covid-19 pandemic are the most recent examples of recessions that led to the eruption of oil prices to unprecedented values. In conclusion, the main reason for oil price volatility in this first period were geopolitical events (*Noguera-Santanella, 2016*).

The second moment occurred between 1987 and 2020, a period influenced by September 9th, 2001, and the attack to the Twin Towers in the United States. The period of extreme uncertainty and market speculation led to a huge increase in oil prices. This period, also marked by the oil workers' strike in Petroleo De Venezuela S.A. (PDVSA) and the war in Iraq, continued until around 2008 when WTI hit the record high price of 147.25 USD/barrel. In summary, a negative correlation can be established between oil prices and OPEC daily production in this most recent period of extreme volatility in oil prices.

Historical data shows that the average OPEC crude oil price, from a basket of crude oil different barrels, evolved from 1.21 USD in 1970 to 102.97 USD in 2022 (*Statista*). WTI crude oil evolved from 26.41 USD in 1970 to 81.19 USD in 2022 with an all-time high of 190.68 USD in June of 2008 (*MacroTrends*). The Brent crude oil evolved from 2.23 USD in 1970 to 85.79 USD in 2022, with an all-time high of 147.5 USD observed in July 2008 (*Trading Economics*).

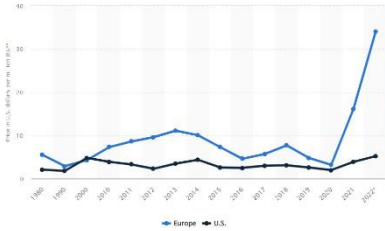
Figure 8 - Crude oil price (1980 - 2022)



Source VIII: *Trading Economics*

▪ Natural gas market overview

Figure 9 - Natural gas prices 1980 - 2022 (EU vs US)



Source IX: Statista

Figure 10 - Crude oil (blue) vs Natural gas (orange)



Source X: Trading Economics

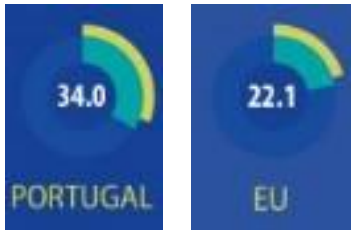
Contributing a high percentage of Galp’s revenue, the natural gas industry and its history are matters of high interest for this valuation. Despite being mostly explored in Brazil (*Campos et al, 2017*) by the Company, the industry started being explored and commercialized in the United Kingdom in the 18th century and substituted the so then called “town gas” in the 1960’s. However, it was in the United States that the industry matured and modernized, since it surpassed all other countries in the production and consumption of natural gas (*Tussing & Barlow, 1984*).

Historically, the evolution of natural gas’ prices has always followed the trend of oil prices, which led some to consider them to be substitutes (*Brown & Yucel, 2008*). Additionally, they can also be seen as complements and rival goods (*Joutz & Villar, 2006*). Nonetheless, more recent studies show that natural gas can affect countries’ economies by itself, demystifying the previous statement that it was dependent on the evolution of oil prices (*Naqvi et al, 2022*). An article written by *Sonnichsen* in Statista in April 2022, shows the evolution of natural gas prices in Europe and in the United States between the years of 1980 and 2022 (measured in U.S. dollars per million British thermal units). European prices evolved in an increasing trend (*Acaravci et al., 2012*) starting in 5.5 in 1980, followed by a sharp decrease to 2.9 in 1990, continuously increasing until the 2013 when it peaked at 11.1, followed by yet another sharp decrease until 3.2 in 2020, only to boom in the following years closing at an outstanding amount of 16.1 in 2021 and being around 39 in more recent statistics. The United States were able to maintain its prices within a good range, showing to be less volatile than the Europe ones. In 1980 it was of 2.1, surpassing the European ones for the first and only time in history in the year 2000 with 4.8. Afterwards, it entered a decreasing trend until it reached a price of 2 in 2020. Finally, it abnormally increased in the last 2 years to 3.9 in 2021 and surpassing the barrier of 6 in 2022.

The differences in prices between the US and Europe can be explained by the fact that the production capacity of the United States has always been way superior and have had better access to natural gas exploitation tools, devices, and conditions than European countries. Regarding the price evolution itself it was, following the trend of oil prices, heavily affected by geopolitical incidents that occurred over the years. The most remarkable one, Covid-19, led the prices to plummet in 2020, due to a shortage in demand which was then quickly followed by a supply side shortage as the world economy was trying to recover, causing the prices to explode. In fact, the expectation for the future is for prices to continue to increase due to the negative impacts of the Russia-Ukraine war that started in 2022.

- Renewable market overview and the future of energy

Figure 11 - Renewable energy as a % of gross final energy consumption



Source XI: Eurostat

These days the renewables market is well established, known for its innovative and sustainable practices, and, for some, a solution in the fight against fossil fuels and their history of pollution and destruction. Furthermore, the Sustainable Development Goals are coming to the final decade to meet its objectives for 2030, which helps boost this industry within the next years.

In the United States the renewable energy market size was estimated to be of 768.9 billion USD in 2021, with an estimated CAGR of 15.1% between 2020 and 2030, showing the huge growth potential of the market. Solar and wind power energy sources are the most prominent among the renewable energy sources (insert image). The European Union has the primary objective to become the world's first climate-neutral continent by 2050, as agreed in the European Green Deal, an accord formulated in 2019. A 2020 update reveals the importance given to this agreement, since the only country belonging to the Union that did not meet the criteria was France. Most countries were overachievers on the consumption of renewable energy as a percentage of gross final energy consumption. (*Appendix - Image 1*)

It is defended by literature that the European Union is divided into two groups – the first group is composed by countries that have the highest employment rates in the renewable energy sector as a fraction of full employment and a well-developed renewables sector overall - in what concerns the production and usage of renewable energy for electricity consumption (*Frodyma et al., 2019*). It is defended by the authors that these countries have more propensity to consume electricity obtained from renewable sources.

Other papers defend the positive impacts of renewables in the most developed countries of Europe such as Germany (*Rafindadi & Oztur, 2017*). However, some earlier papers, show a more conservative view defending that there is no correlation whatsoever between GDP growth and the amount of renewable energy consumed ⁽²⁰⁾⁽²¹⁾⁽²²⁾ as it seems a controversial and well debated subject by the community.

Nevertheless, the fast growth that was witnessed these past decades, also encounters limitations as in the possible saturation of the renewables market, due to the strategic placement it brings companies and the flexibility of innovation (*Asknes et al., 2017*). Besides, a feeling of retraction is exposed in some investigators, since a high share of renewables in the energies companies' portfolios around the world may come to much different results with unpredictable effects for the market (*Anaya & Pollitt, 2016*).

All in all, the impact of this sector is undeniable in the world we live in and the potential for its growth, complying with all the Sustainable Development Goals, the EU goals for 2050 alongside many others' objectives to be conquered, cannot be ignored.

- Covid-19 impact

Aside from the other downturns and major shocks in the world's economy, in order to potentially have a more accurate view towards the future of the industry it is important to study the effects of the most recent world economic downturn, the Covid-19 pandemic.

The energy market resented the Covid-19 pandemic, with the crude oil prices dropping down from 50% to 80% in the first quarter of 2020. Moreover, oil prices reduced 10% at that time and oil futures such as WTI and Brent dropped, on average, 20% for the first time since they have been around in the energy market (*Shaikh, 2022*). The difficulties felt on the supply side of the production chain led to companies shutting down their production, since they revealed to be unable to meet neither their production requirements nor their fixed costs in a sustainable way (*Fu & Shen, 2020*). Nevertheless, some authors believe that energy demand was also heavily affected as its average growth rate within the main regions of the world plummeted in about 6.2% in 2020. In this paper, it is also argued that demand was more affected during extreme lockdown measures, improving when the measures started being lifted (*Jiang et al. 2020*)

However, authors defend that the household energy demand has increased as well as the potential for the use of energy from renewable sources, which allowed the industry to sustain within the pandemic.

Regarding the first, *Kawka & Cetin (2021)* defend that despite studies showing an overall decrease in electricity demand, household electricity demand has shown an increase of 30% during the pandemic in the U.S. The study performed had shown a higher electricity use during the day, when people used to be out at work. Consequently, morning electricity peaks were replaced by late afternoon peaks and data usage increased 47% in the U.S. from 2019 to 2020 mostly allocated to streaming services, remote work applications, social media and gaming. Moreover, there was a higher use of household appliances as well as an increased amount of energy usage from solar panels during the day. Household energy represented around 38% of total energy use and during the pandemic increased, in some states, around 8.9–12.4%, such was the case of California. Europe followed the same trend where the decrease in overall energy demand was fuelled by a reduction in the commercial loads in the big cities, in spite of the increase in

household consumption. During the pandemic, around midday in the UK, household energy consumption increased by 30%. As a consequence, household electricity billing increased substantially in the stay-at-home regime during the peak of Covid-19. (*Li et al. 2021*).

On its hand, the renewable energy market was also heavily affected by the pandemic since the end of the first quarter of 2020. Although Covid-19 delayed multiple green emissions projects around the world and several renewable energy stations ceased operating during that period, it also brought benefits to the cause. During the pandemic, daily global CO₂ emissions fell by approximately 17% in April 2020, compared to the previous year, and decreased around 8% when compared to the levels of 2010 (*Kuzemko et al. 2020*). It is important to notice that this reduction occurred due to the ceasing of most operations, such as factories shutting down and surface transports being used to the minimum with the new restrictions. Indeed, the overall market growth on renewable energy was of -13% from 2019 to 2020, according to the International Energy Agency (IEA). Nevertheless, the Covid-19 pandemic has shown the potential of the development of this industry for the global economy and the raising impact of not only the growth of developed countries in the main regions of the world, but also of the emerging regions, such as Asia, Latin America and sub-Saharan Africa where the conditions are more and more met to the development of renewable energy projects.

In summary, the Covid-19 pandemic affected harshly the energy market overall with special attention on the plummeting of the non-renewable energy sources prices. Despite the loss in value registered in the electricity and renewables market, there were some positive aspects that show the potential of the industry moving forward, in what concerns the increase in household energy consumption (possibly in a hybrid work model developed by companies) alongside the increased awareness raised towards renewable energy sources, reducing the CO₂ emissions, aligned with the 2030 agenda and the sustainable development goals.

- **Russia-Ukraine War impacts**

The Russia-Ukraine War that started earlier this year in the month of February, is the main influencer of the behaviour of oil and natural gas prices nowadays, as well as the emergence of renewable energy and its affirmation in the energy market (*Stephen & Patt, 2022*).

In a recent study conducted by *Isaac Appiah-Otoo (2022)*, performed to check any sort of relationship between the War and the raise in oil prices in the United States, a causal relationship between the two variables was found. Following the same trend, as already mentioned in the literature, the European market also saw its

prices skyrocket, as the War retired multiple supply chains as well as the discontinuance of most relationships with Russia. This discontinuation of supply chains is a serious problem that affects multiple key markets around the world, not only the energy market, but also all sorts of raw materials and primary goods (*Dinh et al., 2022*)

Furthermore, the stock market suffered quite a bit with the flourishing of the War. Through a paper investigating the impact of the Russia-Ukraine conflict on the stock market efficiency of six developed countries, the market efficiency hypothesis is rejected, and the authors expose the predictability of the decrease in asset prices in times of instability, especially in what concerns geopolitical affairs (*Bonacim et al, 2022*).

Ultimately, this armed conflict brings a lot of uncertainty to the World and surely its effects will continue to unravel during the next months. The already visible ones show a sharp increase in energy commodity prices, alongside the increasing urgency for renewable energies to step up in order to put a tone to the dependency on fossil fuels.

In sum, the literary work on Galp's future projects and operations are important to infer on possible red flags or value creation opportunities. In fact, it seems as if the Company will have a lot of openings to increase its value through the projects it is developing, specially concerning renewables. As previously mentioned, the solar energy market is the fastest growing among the renewable energy sources, bringing immense potential for the future projects directed at the expansion of the Company's productive capacity in the sector.

Another relevant point exposed by the literature concerns the fact that the energy market is expected to calm down, turning to a positive trend in the next few years as the Russia-Ukraine War effects start to dilute. Thus, there might be some openings regarding the calming of the effects on oil and natural gas prices, which can improve the efficiency of the Upstream sector.

On one hand, the Company expects to meet exceptional numbers in the capacity of energy to be produced via renewable sources, which despite not being their main source of revenue, could very much become so a few years from now. This assumption takes into account the fact that the world is changing, and renewable energy sources are slowly but surely taking over fossil fuels in the energy market. On the other hand, there is a feeling of change around the energy market. The uncertainty and high speculation brought by Covid-19 and confirmed by the Russia-Ukraine armed conflict made it such that investors are now considering their options, eager to jump in, thinking that the market could not get any worse

than this. As a consequence of this mindset, and as the effects of these geopolitical events wear off, investors expect the market to improve within the next decade, increasing the prospects of energy enterprises and their respective share prices. In summary, both of these reasons align perfectly with the incentives of Galp, since the Company has plans to expand its operations and is already outperforming under times of uncertainty and pressure from external sources.

Report analysis

Overview

The final purpose of this report being to offer an investment recommendation for current and prospective Galp shareholders, the preparation of a financial model is mandatory to price the stock, based on the Company's past performance and its investment focus for the years to come. Therefore, the model takes into strong consideration the information contained in the Company's published annual reports – financial data as well as comments and clarifications on managers' perspective.

For the sake of completeness, in addition to the annual reports, quarterly data were also extracted and used to compensate for the lack of available data for the year 2022. This reduces the margin of error since it reduces the extent speculation by shortening the gap between the reported data and the projections – the valuation is taking place at year-end 2022 and the only missing information pertains to the fourth quarter and speculating on the past three quarters is counter-productive. As a result, this increases the accuracy of the model and the trustworthiness of the results.

Reformulation

This report will base most of its decisions on valuation methods based on cash flow discounting. In order to estimate useable Free Cash Flow (“FCF”) predictions that are appropriate to prepare for the Company's valuation, it is important to first establish a distinction between its core and non-core businesses, which will have different effects on the Company's activities in the futures. Therefore, the income statement and balance sheet were re-organized to group line items according to their importance to Galp's main business segments.

In this stage, it is crucial to properly separate all that refers to the Company's external sources of funding – i.e., debt and equity financing. This will uncover the Company's capacity to generate cash without having to resort to debt and ignore the negative impact of interest payments on the income statement. Then, for the reasons above, removing the non-core business activities from the Company's main core focus is beneficial for a more in-depth analysis of its operations.

For instance, results deriving from Galp's activity in financial assets and instruments are not directly linked to its capacity to explore and sell energy from fossil or renewable sources, and the Company's performance in such markets should be valued separately. Thus, this valuation can easily be adjusted in case the Company decides to change its strategies with regards to these non-core activities.

Forecasting Assumptions

- General assumptions

As previously mentioned, the fiscal year in which the valuation takes place is ongoing, and special assumptions must be made for 2022. The authors have opted to project the trend from past three or four quarters into the last trimester of the year, which should provide an accurate prediction of the Company's performance.

Upon a first look at the model, the length of the forecasting period becomes quite noticeable. This is due to the importance of the targets that were set to meet the UN's Sustainable Development Goals for 2030 and the European Green Deal for 2050, and Galp's proactivity in implementing new businesses to adjust to the expectations of a net-zero economy. Since this approach from the Company will require substantial investments, which will, in turn, take time to turn operational, this delay in the start of the perpetuity becomes necessary.

Also, it is noteworthy that each line item has its own set of assumptions (further detailed below), most of which are based on a ratio such as percentage of revenues, for instance. This is helpful since many line items are sensitive to revenue or costs.

In the preparation of this report, the most common way of keeping line items constant is by taking the rolling averages from the previous three or four years, depending on the availability of data. This has a stabilizing effect on the values in the long term, while keeping a certain natural (minimal) volatility in the short term. Taking this approach is more realistic than using a fixed average, which would eliminate unpredictability in the cash flows completely.

- Market indicators

Some market indicators are made available from the Company through the quarterly reports, which aid in accurately matching exogenous market factors with the data. This is important since Galp's activities are reliant on those external factors.

Therefore, this data must be forecasted using readily available data, like the current futures quotes, or by assuming they will maintain a certain level. The former is used for exchange rate and commodity price predictions, and the latter for all the remaining predictors and value drivers.

In addition to the market indicators included by the Company in its reports, another factor with considerable and increasingly important prediction capacity was extracted from another source – the expected average electricity prices in the EU. This information was taken from the EU Reference Scenario 2020, published July 2021 by the European Union Publications Office, which offers a broad estimate of the evolution of electricity price every ten years from 2020 to 2050. To report this trend in a yearly basis, the Compounded Annual Growth Rate (“**CAGR**”) was calculated.

- Commodity price expectations

Given the industry in which Galp operates, the model uses Brent and Dutch TTF as price indicators for oil and gas, respectively. Due to the inherent volatility of those markets, this report assumes the current Brent and Dutch TTF futures quotes (extracted from CME Group website) to be adequate predictors for future spot rates for oil and natural gas. This assumption allows the use of those figures to predict movements in the value drivers of the Company's business segments.

- Currency expectations

Similarly, the future values of USD:EUR and USD:BRL exchange rates are based on the current Euro FX Futures quotes (also extracted from CME Group website) – as an adequate predictor for future spot rates. These figures are used to adjust the convert Brent prices from USD to EUR, which is the currency used in the model. Thus, the model uses the adjusted expected prices of Brent oil as a variable for the main value drivers of growth.

- Value drivers for revenues

In order to most accurately predict fluctuations in total revenues, the revenues from each business segment were analysed separately. Only then can the most relevant operational data and market indicators be identified, such that they

become reliable predictors, or value drivers. Each value driver takes into account internal operational factors as well as exogenous market-driven effects, such as market price of oil and gas as well as the expected fluctuation of currency.

These value drivers incorporate several more intricate and precisely tuned assumptions that have a direct effect on the top line of the operational model. Each segment then provides what is referred to in the model as an **Equalization Factor**, which is essentially a multiplier used to bridge the gap between the value drivers and its respective segment's revenue.

- Upstream

The Upstream activity refers to the production of oil and gas through the exploration oil and gas assets and fields. Thus, the overall production of the commodities is forecasted using appropriate yearly growth rates and used as a measure of activity. Overall, the revenues from Upstream activity can be taken as a product of the production, market prices and the Equalization Factor.

- Industrial & Energy Management

This business segment refers to refining, gaseous and liquified natural gas trading, and electricity cogeneration activities engaged by the Company. The refining business is expected to evolve in tandem with the oil production, while trading is projected to maintain a constant level. A strong initial increase followed by a progressive tapering of growth in the sale of electricity are expected, due to high expectations for the electricity market.

- Commercial

Revenues in the commercial business derive from sales point for oil products, natural gas, and electricity. Like the refining business, oil products sold can be expected to track the production of oil. On the other hand, natural gas has become a crucial market since the Russia-Ukraine war, and a strong shift toward European producers and sellers can be expected – which is why a consistently strong growth can be foreseen in the next few years. Electricity sale also has a substantial potential for growth, especially when considering the positive market sentiment towards alternatives to oil and natural gas derivatives.

- Renewables & New Businesses

The renewables business is critical to the Company's revenue forecast, given the strong push towards clean energy. Considering Galp's focus in exploiting this change in market preferences, especially the Company's ambitions to lead the green hydrogen space in Iberia, one can expect for a very steep increase in activity, and for a persistent strong growth for a few years.

- Consolidation Adjustments

The sole purpose of this item is to adjust for redundancies during consolidation. Therefore, the three-year rolling average will suffice for stabilizing it for the forecasted period.

- **Other assumptions**

Accurately forecasting the cash flows requires many assumptions which are specific to each line item in the financial statements.

- Operating Cash

Operating cash is estimated to be 5% of Capital Assets, which, for Galp, serve as a better proxy operating cash than revenues because the latter is more susceptible to commodity market volatility, while the business is very capital intensive. Thus, one can assume that the cash necessary for operations will increase jointly with the increase in PPE.

- Capital Assets

The capital assets are separated by type: tangible assets, intangible assets, and leases. Since the Company's activities are highly capital-intensive, most of the movements will occur within tangible assets, while the other two are held constant for the forecast.

The forecast is based on a value-driven investment case, which relies on a clear capital allocation framework – the Company will be allocating around 50% of its net investments in the 2021-25 period towards low-to-no-carbon activities. This means special attention must be given to the additions to tangible assets, which can be expected to increase substantially from 2023 until 2030 to meet the EU's targets, before stabilizing. Level of capex investments were not considerable in 2022 because of a focus on accumulating cash. It is also noteworthy that the level of depreciation must also accompany this strong capex.

Another important factor is the “currency exchange differences and other adjustments” line. There is positive relationship between this line item and the increase in revenue from the previous year. This is due to the expectations made during budgeting, which must be revised downwards in case of a decrease in revenue and upwards if revenues increase more than expected. The observed relationship was kept on a constant level during forecasting.

Also, it is noticeable that “lease liabilities”, a line item from the statement of financial position, are kept as a function of right-of-use assets.

- Associates and Joint Ventures

Associates and joint ventures are investments Galp has made in other companies within the sector – either holding a minority or majority stake and with varied control over their respective activities.

The companies contained within this specific line item operate in the same sectors as Galp, and one could assume the value of those investments would vary somewhat closely to the variations in revenue, which is why total revenues are used to gauge the evolution of those figures throughout the forecast.

Given the availability of information regarding net debt and the cash balance by the end of the third quarter, one line item had to be adjusted such that the predicted cash flows do not generate an excess of cash, which would be conflicting with the expected net debt balance. This responsibility would befall on the book value of Associates and Joint Ventures, which, consequently, has a particularly important role for the last quarter of 2022.

- Working Capital

The cash conversion cycle is central to predicting movements in working capital. Keeping the average holding, collection and payable periods constant allow for a natural adjustment of the inventories, accounts receivables and accounts payable, based on revenues and cost of goods sold.

Adjustments must also be made with regards to other receivables and other payables, which relate to non-core activities.

- Financial

Financial assets and liabilities all refer to non-core activities and, as such, were kept consistent. The same goes for all financial income and expenses, excluding interest on debt and results from derivative financial instruments.

The interest is calculated by using the cost of debt (see Discount rate) as the interest rate. Since derivatives are widely used for hedging purposes, one can assume that the movements in derivative instruments will, on average, cancel each other out, resulting in a net zero effect on the income statement.

- Debt

Due to the high capital intensity of the business, loans and bonds are predicted to track movements in PPE, while origination fees and bank overdrafts are disregarded.

- Taxes

The statutory tax rate for Galp is 31.5%, as per its annual statements. However, due to its operations in Brazil and Angola, it must pay other taxes. Among these are: the 50% charge on the Angolan projects' "profit oil" (IRP); the Special

Participation Tax (SPT) for its activities in oil exploration in Brazil; and the Energy Sector Extraordinary Contribution (CESE). The “profit oil” and SPT track the revenues from upstream activity, while CESE, other adjustments and deferred taxes can be considered constant.

Income tax receivable and payable balances are removed completely for the model, due to their minor importance and to the impracticality in estimating such figures.

- Provisions and Derivative Instruments

The provisions are the set of expected liabilities that the business will owe and need to cover in the future. All provisions are estimated to maintain a relatively constant level throughout the forecasting period.

Derivative instruments are useful for O&G companies since they allow continual hedging and provide support for the businesses’ main activities. Given their stabilizing effect, these are also expected to remain constant.

- Share Capital and Non-Controlling Interest

According to Galps’ 2021 annual report, base dividend payments to its shareholders are expected to increase 4% annually from 2022 onwards. Notwithstanding, the maximum amount paid out to shareholders is the equivalent of one third of its Operational Cash Flows (“OCF”), and the Company expects those levels to be achieved in the following years.

Dividends paid out to non-controlling interest are projected in the model to maintain consistency and are expected to be fully paid and without deferral.

Currency translation reserves and share capital decrease are not forecasted in the model, since they are not deemed to materially affect the Company, based on its plans for the conceivable future.

- Revenues, Costs and Expenses

In addition to revenues from the business segments detailed above, there is another portion of the total revenues that relates to other, non-core revenues. These include Galp’s revenues from a reinsurance business and a provider of shared services at a corporate level.

Regardless of having forecasted the total revenues from each business segment, it can be useful to acknowledge the proportion of revenues from services and sales, which have consistently been between 3 and 5 percent.

Also, in addition to total revenues, there are other operating incomes, which tend to follow the trend of sales and services.

With regards to the earnings from Associates and Joint Ventures, which registered in the income statement, the rolling 3-year average was used for the forecasting period, since no direct relation could be found between this income statement item with the values registered for associates and joint ventures in the balance sheet and there is no clear utility in predicting any drastic movement in this line item for the future.

Employee costs depend heavily on the previous year's activity, which is why it was estimated as a percentage of the previous year's total revenues.

Valuation

After having reformulated the financial statements and estimated the cash flows for the forecasting period, all that's left is applying different valuation methods to reach an admissible share price, upon which the recommendations can be made.

An important consideration to make is that Galp's Enterprise Value ("**EV**") does not include the Company's net debt. Therefore, it is crucial to subtract the debt or cash balance, when applicable, to attain the value of equity.

Adjusted Present Value

The Adjusted Present Value ("**APV**") method values each component of the Company individually and aggregates those to reach a final value for the business. This method is especially useful when the debt levels are pre-defined because the present value of the interest tax shields can easily be estimated.

- Discount Rate

Using the appropriate rate to calculate the Terminal Value (TV) – which encapsules all future cash flows in perpetuity for the Company – and to discount the cash flows during the forecasting period is essential to the accuracy of the model.

The APV method will only require the use of the unlevered cost of capital and the cost of debt to calculate a reliable equity value, which is why it is central in the valuation process – it allows for a more accurate estimation of the other discount factors.

The above-mentioned cost of debt was found by looking at the yield to maturity of Galp's 6-year bonds maturing 2026 paying 2% coupons and estimating the

Company's risk of default. On the other hand, the calculating the unlevered cost of capital is a more complex and will require calculating the Company's unlevered beta, obtained indirectly through the Bloomberg Terminal, and the risk-free rate. The latter must be the rate on a developed large country's sovereign debt, since it must bear very low risk while maintaining high liquidity. The rate commonly applied to European companies with cash flows in Euros is the German Bund 10-year yield since it satisfies those requirements.

Also, given how the unlevered beta is a weighted average of the Company's debt and levered betas, the current market capitalization of the stock was the measure for equity used in the calculations. The Market Risk Premium ("MRP") was established such that the current WACC (using readily available market data) equates to the median level for global integrated O&G companies of 7.95%.

	S+P Rating Based WACC		
	Minimum	Median	Maximum
Global Integrated	6.50%	7.95%	8.29%
Global E&P	8.16%	9.04%	9.95%
North American E&P	6.06%	10.72%	13.72%
Permian	7.05%	8.77%	11.30%
Marcellus&Utica	6.76%	8.04%	14.18%
Bakken	8.86%	9.79%	13.15%
Eagle Ford	7.94%	9.48%	11.61%

Source XII: Own Valuation Model

▪ Methodology

The APV valuation method is based on identifying and separating the individual components to be valued. In addition to the core and non-core FCFs, interest tax shields were also included as a supplemental element.

The unlevered FCF for both the core and non-core business assume a perpetual growth rate equal to the expected inflation in the European Union for 2027. This value is in line with the previous growth rates expected for the end of the forecasting period in the case of the core business activities and is close to the CAGR for the non-core FCFs. The discount rate used is the unlevered cost of equity.

The only component of the APV that will use a different discount rate is the valuation of the present value of tax shields. These will be discounted at cost of debt and will grow at the same rate as the core business FCFs, since it assumes a constant debt-to-equity ratio for the perpetuity. It is worthwhile to note that the discount rate for the terminal value increases due to the higher risk associated to fixing the debt to the equity and will therefore move closer to the unlevered cost of capital.

Also, for the purpose of this valuation, it is assumed that the book value of debt is registered at fair value since it inherently incorporates risk.

▪ Result

The APV method values Galp's equity at EUR 10.5 billion and its stock at **12.66 €** per share.

▪ Sensitivity analysis

Table 1 - Sensitivity Analysis

Sensitivity of Share Price to MRP and perpetual core FCF growth		MRP						
		6.50%	7.00%	7.25%	7.50%	7.75%	8.00%	8.50%
FCF g	1.00%	12.27 €	11.46 €	11.09 €	10.74 €	10.40 €	10.09 €	9.50 €
	1.50%	12.90 €	12.02 €	11.61 €	11.23 €	10.87 €	10.53 €	9.90 €
	1.67%	13.13 €	12.22 €	11.81 €	11.41 €	11.04 €	10.69 €	10.05 €
	1.83%	13.38 €	12.44 €	12.01 €	11.60 €	11.22 €	10.87 €	10.20 €
	2.00%	13.64 €	12.65 €	12.22 €	11.81 €	11.41 €	11.04 €	10.36 €
	2.50%	14.52 €	13.43 €	12.94 €	12.48 €	12.05 €	11.64 €	10.90 €
	3.00%	15.59 €	14.34 €	13.79 €	13.27 €	12.79 €	12.34 €	11.52 €

A sensitivity analysis was done to assess the effects on the per share price of the stock of the MRP and the core FCF perpetual growth rate. For the former, the range studied was from 6.50% to 8.50%, with increments of 0.25%, and latter spans from 1.00% to 3.00%.

Table 2 - Conversion Table

Conversion table		MRP			
		6.50%	7.00%	7.25%	7.50%
MRP	7.22%	6.50%	7.00%	7.25%	7.50%
R _U	1.93%	1.93%	1.93%	1.93%	1.93%
Beta debt	0.31	0.35	0.33	0	
Beta levered	1.13	1.13			
Beta unlevered	0.89				
R _E					
R _U					

Rather than assessing the sensitivity of the price to the discount rate, this analysis takes uses the MRP, which is an important variable in the estimation of the unlevered cost of capital. However, to evaluate the appropriateness of the use of this particular range of MRP, each input value was translated into the costs of debt, equity and capital. This validated the sensitivity above since the implied discount rates fit within an acceptable interval.

Source XIII: Own Valuation Model

For comparison purposes, the rates used in the main model were illustrated alongside the values calculated.

Flow to Equity

The Flow to Equity (“FTE”) method values to equity cash flows – i.e. the transactions between the Company and its shareholders.

- Discount Rate

For the FTE method, the cost of equity will be the appropriate rate to discount the cash flows paid out and received from equity holders – this rate will be implied from the APV calculations. The Terminal Value assumes a constant debt-to-equity ratio in perpetuity, hence the cost of equity $r_E = r_U + \frac{D}{E} * (r_U - r_D)$. On the other hand, the forecasting period predicts movements in debt balance and the effect of tax advantages from contracting debt will vary based on the leverage ratio, hence the cost of equity used is $r_E = r_U + \frac{D-PVTS}{E} * (r_U - r_D)$, where PVTS refers to the present value of tax shields – which, in turn, were discounted at the cost of debt.

- Methodology

Due to the clear policy and the guidelines provided by Galp regarding dividend distribution strategy, the present model assumes Galp will adhere to the growth expectations for the base dividend perpetually.

Since it is expected that Galp distribute up to one third of the OCF, for which core EBITDA is used as an acceptable proxy after deducting the Company’s total tax expenses. The present model assumes Galp will be able to successfully deleverage while investing in accordance with its growth strategy and assumes the managers’ priorities lie first and foremost with its focus on expanding renewables

and hydrogen in time for the 2030 targets, but its activities are solid enough to avoid sacrificing the expected dividend payments.

The perpetual growth rate of these flows is expected to steady at the predicted growth rate for the base dividends.

- Result

The FTE method values Galp's equity at EUR 10.4 billion and its stock at **12.51 €** per share. It is noteworthy that the FTE method does not require any consideration towards debt, but cash is still an asset that add value to equity holders and must be included.

Discounted Cash Flow

The Discounted Cash Flow ("DCF") method is a very common way of conducting the valuation of a company or project, due to its simplicity in incorporating the effects of leverage into its discount rate.

- Discount Rate

The DCF requires the use of the Weighted Average Cost of Capital (WACC) to discount the unlevered FCF, and $WACC = r_D * \frac{D}{D+E} * (1 - t_c) + r_E * \frac{E}{D+E}$ – where r_D is the cost of debt estimated in the unlevered cost of capital calculations, r_E is the cost of equity calculated for the ECF, t_c is the statutory tax rate, and D and E are the fair values for debt and equity, respectively.

The book value of equity does not behave in the same manner as debt, which is why it's necessary to use a proxy. The proxy used for the fair value of equity value was the current market of Galp equity value calculated using the APV method. This is necessary because the APV will allow for the calculation of the equity cost of capital, based on the leverage ratio attained from having calculated the fair value of equity. It is also preferable to taking the current market capitalization of the Company because the leverage ratio is not fixed throughout the forecasting period and, since the debt-to-equity must be recalculated each year, it is necessary to have an up-to-date fair value of equity – which is not reflected in the current market capitalization.

- Methodology

A DCF valuation is convenient when assuming a constant debt-to-equity ratio, since the method does not require the added trouble of valuing the interest tax

shields explicitly. Instead, this tax advantage is incorporated in the WACC, so the Company's EV is calculated directly from the unlevered FCF.

- Result

The DCF method values Galp's equity at EUR 10.5 billion and its stock at **12.66 €** per share.

Multiple valuation and peer analysis

- Peer choice

In addition to the previous cash flow-based valuation methods, in order to explore the full value creation potential in the global markets, a valuation through multiples was performed. Even though Galp operates mostly in the Iberian region, it exports to more than 80 countries around the world. Therefore, it is only natural to speculate on the ability of the Company to match its global peers and not solely the European ones. In order to appropriately compare Galp with its peers in the global energy market, those must first be sorted by Enterprise Value and Market Capitalization.

The diversified offer of enterprises brings positive and negative aspects to the valuation. On the one hand, the valuation is harmed by the fact the companies are too dispersed geographically and operate in different areas of the globe. Furthermore, the operating activities and the core business of the companies may differ or have only a few aspects in common, which may also hinder the valuation.

On the other hand, considering a wider geographical area allows for Galp to have a more diversified peer group, which unlocks the full potential of the Company in a scenario where it expands worldwide. It is a bold, unorthodox but unbiased peer group choice that shows a different view. There is always a confirmation bias built around the peer group choice, since it is often to restricting to the Company's geography, EV, market capitalization, operating market, sector, among other factors. Indeed, when choosing the defining factors of the peer group, investors look for what they already know to be true, not exploring different options.

The main constituents of the peer group prepared for the valuation of Galp are: Southwestern Energy CO and Washington H. Soul Pattinson in North America, Raizen SA and Empresas Copec SA in South America, China Merchants Energy, Adaro Energy Indonesia and Idemitsu Kosan CO LTD in Asia Pacific, and VAR Energi and Polski Koncern in Europe.

▪ Analysis

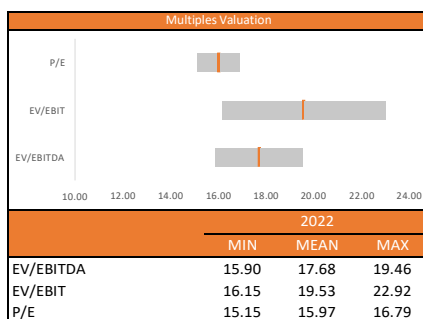
Table 3 - Multiple Valuation

Multiples Valuation	Equity Value					
	Mean		Median		Min	
	Historical	Forward	Historical	Forward	Historical	Forw
EBITDA Multiple						
EV/EBITDA	16.135	16.796	13.187	11.936		
Price per share	19.46	17.84	13.90			
EBIT Multiple						
EV/EBIT	19.003	1				
Price per share	22.9					
P/E						

Source XIV: Own Valuation Model

The valuation was performed around 3 main multiple types: the EBITDA multiple (EV/EBITDA), the EBIT multiple (EV/EBIT) and the Price-to-Earnings multiple (P/E). The minimum, maximum, median and average values of each multiple were then extracted from the peer group. This use of different sets of multiples provides a range of results, each of which allows for different conclusions regarding Galp's price per share.

For the sake of completeness, the analysis was done using the results expected from 2022 as an accurate predictor for current price, as well as the financial results from 2023 to estimate the potential growth of the company in one year.



On the one hand, adopting the minimum values of the peer group would be unsustainable for the Company, since the share price would drop close to 0 considering certain multiples as, for instance, the EV/EBITDA and the EV/EBIT. On the other hand, the maximum value would grossly overvalue the stock price compared to its current levels, which is extremely unlikely considering the current operating capacity of the Company. Hence, these brackets are not reasonable estimators of the fair value of the company.

	2023		
	MIN	MEAN	MAX
EV/EBITDA	17.84	16.12	17.84
EV/EBIT	13.10	16.10	19.09
P/E	8.41	8.87	9.32

On the other hand, the results from using the average or median values were much closer to current market price and would even indicate a clear undervaluation of the stock, since stock prices would range from 15.15 € to 22.92 € for 2022. However, these multiples indicate a very steep fall in equity value in 2023 – by at least -8.3% and as high as -44.5%.

Still, even though a decrease in valuation between 2022 and 2023 is seen across the board, the share price at all valuations for 2023 achieved through EBITDA and EBIT multiples would be above the current market price – 14.39 € and 13.10 €, respectively. The only valuation multiple that would place Galp below current levels is the P/E since strong revenues growth during the period cause a large increase in the foreseen debt servicing expenses, which directly affect the net profit.

Conclusions

Table – Valuation Summary

Financials	2022	2023
Cash Flow-based Valuations		
APV Valuation	12.66 €	12.73 €
	7.4%	8.0%
FTE Valuation	12.51 €	12.53 €
	6.1%	6.3%
DCF Valuation	12.66 €	11.24 €
	7.4%	-4.7%
Multiples Valuations (Median)		
EV/EBITDA	15.90 €	14.39 €
	34.9%	22.1%
EV/EBIT	16.15 €	13.10 €
	37.0%	11.1%
P/E	15.15 €	8.41 €
	28.5%	-28.6%
Multiples Valuations (Mean)		
EV/EBITDA	19.46 €	17.84 €
	65.0%	51.3%
EV/EBIT	22.92 €	19.09 €
	94.4%	61.9%
P/E	16.79 €	9.32 €
	42.4%	-20.9%

The APV and DCF methods value Galp's share at **12.66 €** as of year-end 2022 – i.e., at a 7.4% premium in comparison to the current market price of the stock, which is trading at **11.79 €** per share, as of the 16th of December 2022. The FTE method also values it at a small premium, at a per share price of **12.51 €**. To validate those values, a valuation using multiples from the Company's peers in the energy and oil & gas sector was done, which also consistently valued the stock at a premium.

However, those prices are not dictated by the stock market and the focus of this report is rather on the return current and prospective shareholders can make from an investment in the Company. Therefore, this report must present the expected stock price one year from now, meaning the end of 2023.

For this purpose, the APV method is most likely the method of choice since it is the one that best reflect the effects of interest tax shields on the valuation. The expected share price by year-end 2023 using APV is **12.73 €**. This means that if an investor decides to purchase Galp shares today, he can expect to see his shares appreciate by 8.0% in one year's time. This level of capital appreciation is somewhat confirmed by the FTE method, which estimates a 6.3% increase in share price, which is backed by the P/E multiple, that predicts an even sharper decline in stock price, albeit due to the expenses with the debt used to finance the Company's growth. For this reason, P/E multiple may not be the most useful metric to assess the equity value of Galp during this period.

However, considering the Company distributes 0.74 € in dividends per share, this means the investor gets a **14.3% return on investment** throughout the year. This is a considerable return for one year.

Alternatively, a stand-alone analysis of the valuations estimated using EBIT and EBITDA multiples would predict an overwhelming increase in stock value due to a solid increase in operational profits resulting from the strong tailwind from the commodities market on revenues. Although this may be true, the current situation of the sector may invalidate to some extent the amplitude of this capital gain expectation, which will raise questions about the validity of the valuation methods.

In sum, the net effect of these valuations, which serve as a means of verifying the more robust cash flow-based methods, cancel each other out to some extent, such that the conclusions of this report maintain the expectations for growth and price appreciation in Galp's stock. Additionally, the intensity and scale of this growth are accentuated when considering the dividend yield of the shares.

Financials	2022E	2023F
Current Price	11.79 €	
Valuation	12.66 €	12.73 €
Dividends per share	- €	0.74 €
ROI	7.4%	14.3%
ROE	51%	27%
Core ROIC	28.78%	14.19%

Consequently, although the one-year increase in share price is expected to be less than 10%, the total return investors can be expected to see is around 14% during this period, which is considerable enough for this report to recommend investors and prospective investors alike to **Buy** Galp shares at the current market price of 11.79 €.

This recommendation may be revised and altered upon release of the annual report for the fiscal year 2022, wherein certain crucial assumptions will have to be revised and/or confirmed. Also, upon release of additional information regarding productivity and expected returns from newly launched or soon-to-be launched projects. Which is a factor not considered in this model given the lack of available public figures and information. This would have a strong impact on Galp's Enterprise Value and share price. The common volatility factor in energy market securities and the speculation and uncertainty that involve turbulent periods were also not accounted for, since they can be heavily influenced by unpredictable market sentiment. All in all, there are countless external and internal factors that may influence the valuation of Galp and that cannot be modelled properly, since the added complexity from their inclusion would be purely speculative and may do more harm than good.

In conclusion, the final recommendation of this model for the time being is to **Buy** on trading Galp's share, despite not having analysed the undisclosed data pertaining to the fourth quarter, which should confirm important assumptions.

Appendix

Financial Statements

Core Business

Reformulated Income Statement	2018A	2019A	2020A	2021A	2022E	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F	2031F	2032F
Core Business															
Sales	16,536 €	15,963 €	10,771 €	15,618 €	26,484 €	28,369 €	26,036 €	26,184 €	22,740 €	23,036 €	24,861 €	25,901 €	27,022 €	28,132 €	29,194 €
Services Rendered	647 €	608 €	610 €	499 €	1,091 €	1,178 €	1,107 €	1,029 €	936 €	948 €	1,020 €	1,053 €	1,107 €	1,151 €	1,193 €
Sales and Services Rendered	17,183 €	16,424 €	11,176 €	16,033 €	27,429 €	29,403 €	27,019 €	27,075 €	23,540 €	23,851 €	25,746 €	26,819 €	27,995 €	29,148 €	30,252 €
Upstream		2,475 €	1,768 €	3,058 €	4,619 €	4,351 €	3,945 €	3,850 €	3,696 €	3,680 €	3,850 €	4,004 €	4,172 €	4,350 €	4,531 €
Industrial & Energy Management		6,185 €	4,453 €	6,298 €	4,334 €	7,036 €	7,672 €	8,036 €	8,431 €	8,871 €	9,350 €	9,675 €	10,012 €	10,320 €	10,639 €
Commercial		8,892 €	5,922 €	7,917 €	19,442 €	18,797 €	16,129 €	15,566 €	11,728 €	11,567 €	12,705 €	13,218 €	13,796 €	14,396 €	14,940 €
Renewables & New Businesses		25 €	33 €	50 €	181 €	364 €	467 €	786 €	853 €	907 €	1,010 €	1,093 €	1,186 €	1,252 €	1,313 €
Consolidation Adjustments		- 1,155 €	- 1,000 €	- 1,289 €	- 1,148 €	- 1,146 €	- 1,194 €	- 1,163 €	- 1,168 €	- 1,175 €	- 1,168 €	- 1,170 €	- 1,171 €	- 1,170 €	- 1,170 €
Total Revenues	16,422 €	11,176 €	16,034 €	27,429 €	29,403 €	27,019 €	27,075 €	23,540 €	23,851 €	25,746 €	26,819 €	27,995 €	29,148 €	30,252 €	
Other operating income		368 €	186 €	324 €	542 €	555 €	530 €	526 €	454 €	464 €	499 €	520 €	543 €	565 €	586 €
Earnings from associates and joint ventures		121 €	220 €	83 €	141 €	148 €	124 €	138 €	137 €	133 €	136 €	135 €	135 €	135 €	135 €
Cost of Sales		- 12,623 €	- 8,491 €	- 11,754 €	- 20,552 €	- 22,041 €	- 20,138 €	- 20,155 €	- 17,602 €	- 17,819 €	- 19,210 €	- 20,009 €	- 20,894 €	- 21,746 €	- 22,562 €
Supplies and external services		- 1,650 €	- 1,473 €	- 1,563 €	- 2,962 €	- 3,201 €	- 3,000 €	- 2,880 €	- 2,558 €	- 2,595 €	- 2,799 €	- 2,899 €	- 3,037 €	- 3,161 €	- 3,279 €
Employee costs		- 347 €	- 356 €	- 311 €	- 372 €	- 665 €	- 738 €	- 654 €	- 664 €	- 579 €	- 583 €	- 631 €	- 658 €	- 686 €	- 714 €
Provisions and impairment losses on other receivables		- 6 €	- 114 €	- 74 €	- 129 €	- 184 €	- 141 €	- 151 €	- 133 €	- 130 €	- 143 €	- 149 €	- 154 €	- 161 €	- 167 €
Other operating costs		- 104 €	- 127 €	- 111 €	- 222 €	- 255 €	- 213 €	- 222 €	- 195 €	- 194 €	- 211 €	- 220 €	- 229 €	- 238 €	- 247 €
Core EBITDA	2,181 €	1,021 €	2,628 €	3,875 €	3,759 €	3,443 €	3,676 €	2,981 €	3,131 €	3,434 €	3,566 €	3,701 €	3,856 €	4,003 €	
Margin	13.3%	9.1%	16.4%	14.1%	12.8%	12.7%	13.6%	12.7%	13.1%	13.3%	13.3%	13.3%	13.2%	13.2%	13.2%
Amortisation, depreciation and impairment losses on fixed assets		- 979 €	- 1,289 €	- 960 €	- 885 €	- 1,108 €	- 1,265 €	- 1,362 €	- 1,420 €	- 1,432 €	- 1,498 €	- 1,565 €	- 1,567 €	- 1,580 €	- 1,599 €
Interest capitalised in fixed assets		24 €	22 €	15 €	28 €	22 €	22 €	23 €	22 €	22 €	22 €	22 €	22 €	22 €	22 €
Interest on lease liabilities		- 90 €	- 80 €	- 76 €	- 62 €	- 77 €	- 74 €	- 72 €	- 71 €	- 73 €	- 72 €	- 72 €	- 72 €	- 73 €	- 72 €
Core Result Before Taxes	1,136 €	- 326 €	1,607 €	2,957 €	2,596 €	2,126 €	2,263 €	1,513 €	1,648 €	1,886 €	1,951 €	2,084 €	2,226 €	2,354 €	
Core tax expenses		- 1,026 €	- 242 €	- 1,108 €	- 1,901 €	- 1,667 €	- 1,461 €	- 1,495 €	- 1,218 €	- 1,262 €	- 1,370 €	- 1,418 €	- 1,493 €	- 1,571 €	- 1,645 €
Core Result Before OCI	110 €	- 568 €	499 €	1,056 €	929 €	664 €	768 €	295 €	385 €	516 €	533 €	591 €	655 €	709 €	
Currency exchange differences and other adjustments		- 66 €	- 360 €	372 €	882 €	146 €	- 181 €	4 €	- 266 €	24 €	143 €	81 €	89 €	87 €	84 €
Core Result	44 €	- 928 €	871 €	1,938 €	1,076 €	483 €	773 €	28 €	409 €	659 €	614 €	680 €	742 €	792 €	

Reformulated Balance Sheet	2018A	2019A	2020A	2021A	2022E	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F	2031F	2032F
Core business															
Operating cash	356 €	371 €	321 €	345 €	359 €	399 €	435 €	477 €	482 €	501 €	531 €	551 €	555 €	562 €	570 €
Inventories	1,171 €	1,055 €	708 €	1,007 €	1,769 €	1,866 €	1,711 €	1,720 €	1,501 €	1,516 €	1,636 €	1,705 €	1,780 €	1,852 €	1,922 €
Trade receivables	1,032 €	980 €	781 €	1,243 €	1,827 €	2,003 €	1,899 €	1,912 €	1,623 €	1,658 €	1,798 €	1,870 €	1,945 €	2,029 €	2,106 €
Trade payables	- 933 €	- 852 €	- 650 €	- 811 €	- 1,470 €	- 1,568 €	- 1,451 €	- 1,430 €	- 1,257 €	- 1,272 €	- 1,372 €	- 1,426 €	- 1,493 €	- 1,552 €	- 1,610 €
Net Working Capital	1,270 €	1,183 €	839 €	1,439 €	2,126 €	2,302 €	2,158 €	2,203 €	1,867 €	1,902 €	2,062 €	2,148 €	2,233 €	2,328 €	2,418 €
Current income tax receivable	- €	- €	101 €	139 €	- €	- €	- €	- €	- €	- €	- €	- €	- €	- €	- €
Tangible assets	5,333 €	5,671 €	4,878 €	5,169 €	5,133 €	5,785 €	6,480 €	7,215 €	7,337 €	7,674 €	8,159 €	8,477 €	8,456 €	8,481 €	8,543 €
Intangible assets	547 €	577 €	532 €	645 €	845 €	965 €	1,037 €	1,132 €	1,161 €	1,222 €	1,303 €	1,379 €	1,456 €	1,535 €	1,614 €
Goodwill	85 €	85 €	85 €	85 €	85 €	85 €	85 €	85 €	85 €	85 €	85 €	85 €	85 €	85 €	85 €
Right-of-use of assets	1,233 €	1,167 €	1,002 €	1,079 €	1,202 €	1,224 €	1,184 €	1,199 €	1,133 €	1,124 €	1,149 €	1,168 €	1,190 €	1,216 €	1,245 €
Deferred tax assets	369 €	367 €	509 €	485 €	433 €	448 €	469 €	459 €	452 €	457 €	459 €	457 €	456 €	457 €	457 €
Deferred tax liabilities	- 196 €	- 299 €	- 479 €	- 654 €	- 407 €	- 460 €	- 500 €	- 505 €	- 468 €	- 483 €	- 489 €	- 486 €	- 482 €	- 485 €	- 486 €
Provisions	- 658 €	- 821 €	- 1,009 €	- 1,208 €	- 1,392 €	- 1,584 €	- 1,776 €	- 1,965 €	- 2,156 €	- 2,346 €	- 2,537 €	- 2,727 €	- 2,918 €	- 3,108 €	- 3,299 €
Current income tax payable	- 82 €	- 141 €	- €	- €	- €	- €	- €	- €	- €	- €	- €	- €	- €	- €	- €
Lease liabilities	- 1,233 €	- 1,223 €	- 1,089 €	- 1,179 €	- 1,293 €	- 1,328 €	- 1,284 €	- 1,298 €	- 1,228 €	- 1,218 €	- 1,245 €	- 1,266 €	- 1,289 €	- 1,317 €	- 1,349 €
Investments in associates and joint ventures	1,295 €	870 €	483 €	389 €	488 €	836 €	635 €	629 €	590 €	571 €	620 €	653 €	675 €	705 €	733 €
Invested Capital Core Business	8,319 €	7,807 €	6,173 €	6,734 €	7,578 €	8,672 €	8,923 €	9,632 €	9,255 €	9,488 €	10,097 €	10,439 €	10,418 €	10,458 €	10,532 €

Reformulated Cash Flow	2019A	2020A	2021A	2022P	2023P	2024P	2025P	2026P	2027P	2028P	2029P	2030P	2031P	2032P
Core Business														
Core Result	44 €	- 928 €	871 €	1,938 €	1,076 €	483 €	773 €	28 €	409 €	659 €	614 €	680 €	742 €	792 €
(+) Total Depreciation and Amortization	979 €	1,289 €	960 €	885 €	1,108 €	1,265 €	1,362 €	1,420 €	1,432 €	1,498 €	1,565 €	1,567 €	1,580 €	1,599 €
(-) CAPEX	- 1,375 €	- 696 €	- 1,079 €	- 317 €	- 1,784 €	- 2,193 €	- 2,229 €	- 1,794 €	- 1,821 €	- 1,970 €	- 1,920 €	- 1,579 €	- 1,646 €	- 1,709 €
Additions to Tangible Assets	- 1,232 €	- 624 €	- 809 €	- 25 €	- 1,470 €	- 1,891 €	- 1,895 €	- 1,530 €	- 1,550 €	- 1,673 €	- 1,609 €	- 1,260 €	- 1,312 €	- 1,361 €
Additions to Intangible Assets	- 74 €	- 39 €	- 134 €	- 150 €	- 160 €	- 154 €	- 169 €	- 134 €	- 138 €	- 151 €	- 158 €	- 162 €	- 170 €	- 177 €
Additions to Right-of-Use Assets	- 69 €	- 33 €	- 136 €	- 143 €	- 153 €	- 148 €	- 165 €	- 129 €	- 133 €	- 146 €	- 153 €	- 157 €	- 164 €	- 171 €
(+) Disposal/Write-offs and Other Adjustments	94 €	411 €	- 360 €	- 854 €	- 119 €	201 €	21 €	290 €	- 1 €	- 120 €	- 58 €	- 66 €	- 64 €	- 60 €
(-) Change in Investments in associates and joint ventures	425 €	387 €	94 €	- 99 €	- 347 €	201 €	6 €	39 €	19 €	- 49 €	- 33 €	- 22 €	- 30 €	- 28 €
(-) Change in Goodwill	- €	- €	- €	- €	- €	- €	- €	- €	- €	- €	- €	- €	- €	- €
(-) Change in Net Working Capital	87 €	344 €	- 600 €	- 687 €	- 176 €	143 €	- 44 €	336 €	- 35 €	- 160 €	- 86 €	- 85 €	- 95 €	- 89 €
Inventories	116 €	347 €	- 299 €	- 762 €	- 97 €	156 €	- 9 €	219 €	- 15 €	- 120 €	- 69 €	- 75 €	- 72 €	- 70 €
Trade receivables	52 €	199 €	- 462 €	- 584 €	- 177 €	105 €	- 13 €	289 €	- 35 €	- 140 €	- 71 €	- 75 €	- 84 €	- 78 €
Trade payables	- 81 €	- 202 €	161 €	659 €	98 €	- 117 €	- 21 €	- 173 €	15 €	100 €	54 €	65 €	61 €	58 €
(-) Change in Operating Cash	- 15 €	50 €	- 24 €	- 14 €	- 40 €	- 36 €	- 42 €	- 4 €	- 19 €	- 30 €	- 21 €	- 4 €	- 6 €	- 9 €
(-) Change in Other Balance Sheet Items	317 €	- 150 €	450 €	243 €	264 €	168 €	218 €	90 €	192 €	220 €	211 €	210 €	221 €	222 €
Current income tax receivable	- €	- 101 €	38 €	139 €	- €	- €	- €	- €	- €	- €	- €	- €	- €	- €
Deferred tax assets	2 €	- 142 €	24 €	53 €	- 16 €	- 20 €	10 €	7 €	- 5 €	- 2 €	2 €	0 €	- 1 €	- 0 €
Deferred tax liabilities	103 €	180 €	175 €	- 247 €	53 €	40 €								

Non-Core Business

Reformulated Income Statement	2019A	2020A	2021A	2022E	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F	2031F	2032F
Non-Core Business														
Non-core revenues	147 €	205 €	84 €	145 €	145 €	125 €	138 €	136 €	133 €	136 €	135 €	135 €	135 €	135 €
Financial income	123 €	53 €	27 €	55 €	45 €	42 €	48 €	45 €	45 €	46 €	45 €	45 €	46 €	45 €
Results from derivative financial instruments	-	-	832 €	-	-	-	-	-	-	-	-	-	-	-
Net interest on retirement and other benefits	- 6 €	- 5 €	- 4 €	- 6 €	- 5 €	- 5 €	- 5 €	- 5 €	- 5 €	- 5 €	- 5 €	- 5 €	- 5 €	- 5 €
Non-Core Result Before Taxes	264 €	253 €	- 725 €	195 €	185 €	162 €	181 €	176 €	173 €	177 €	175 €	175 €	176 €	175 €
Non core tax expenses	187 €	100 €	403 €	80 €	40 €	87 €	69 €	66 €	74 €	70 €	71 €	71 €	70 €	70 €
Non-Core Result Before OCI	451 €	153 €	- 322 €	275 €	225 €	249 €	250 €	241 €	247 €	246 €	245 €	246 €	246 €	246 €
Not Recycled OCI	2 €	- 3 €	25 €	-	-	-	-	-	-	-	-	-	-	-
Currency translation adjustments	77 €	- 111 €	45 €	4 €	- 21 €	9 €	- 3 €	5 €	1 €	- 2 €	- 2 €	- 1 €	- 2 €	- 2 €
Other Recyclable OCI	-	9 €	13 €	21 €	8 €	14 €	12 €	14 €	13 €	13 €	13 €	13 €	13 €	13 €
Subtotal OCI	70 €	- 101 €	91 €	12 €	- 7 €	24 €	10 €	9 €	14 €	11 €	11 €	12 €	11 €	12 €
Non-Core Result	521 €	52 €	- 231 €	287 €	219 €	273 €	260 €	250 €	261 €	257 €	256 €	258 €	257 €	257 €

Reformulated Balance Sheet	2018A	2019A	2020A	2021A	2022E	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F	2031F	2032F
Non-Core Business															
Other receivables	836 €	1,194 €	1,143 €	1,178 €	2,037 €	2,372 €	2,234 €	2,106 €	1,856 €	1,908 €	2,055 €	2,122 €	2,224 €	2,320 €	2,405 €
Other payables	- 1,084 €	- 1,464 €	- 874 €	- 1,286 €	- 2,130 €	- 2,390 €	- 2,144 €	- 2,156 €	- 1,871 €	- 1,907 €	- 2,049 €	- 2,136 €	- 2,230 €	- 2,324 €	- 2,410 €
Post-employment and other employee benefit liabilities	- 304 €	- 332 €	- 381 €	- 300 €	- 338 €	- 340 €	- 326 €	- 334 €	- 333 €	- 331 €	- 333 €	- 332 €	- 332 €	- 332 €	- 332 €
Other financial assets	510 €	343 €	592 €	1,552 €	829 €	991 €	1,124 €	981 €	1,032 €	1,046 €	1,020 €	1,033 €	1,033 €	1,028 €	1,031 €
Other financial instruments	- 139 €	- 89 €	- 168 €	- 1,205 €	- 379 €	- 445 €	- 537 €	- 642 €	- 501 €	- 531 €	- 553 €	- 557 €	- 535 €	- 544 €	- 547 €
Invested Capital Non-Core Business	- 181 €	- 348 €	312 €	61 €	19 €	188 €	351 €	45 €	183 €	185 €	140 €	129 €	159 €	148 €	147 €

Reformulated Cash Flow	2019A	2020A	2021A	2022P	2023P	2024P	2025P	2026P	2027P	2028P	2029P	2030P	2031P	2032P
Non-Core Business														
Non-Core Result	521 €	52 €	- 231 €	287 €	219 €	273 €	260 €	250 €	261 €	257 €	256 €	258 €	257 €	257 €
(-) Change in Other receivables/payables	22 €	- 539 €	377 €	- 15 €	- 75 €	- 108 €	140 €	- 35 €	- 16 €	- 4 €	21 €	- 8 €	- 3 €	1 €
Other receivables	- 358 €	51 €	- 35 €	- 859 €	- 335 €	138 €	128 €	250 €	- 52 €	- 147 €	- 67 €	- 102 €	- 96 €	- 85 €
Other payables	380 €	- 590 €	412 €	844 €	260 €	- 247 €	12 €	- 285 €	36 €	143 €	87 €	94 €	93 €	86 €
(-) Change in Financial assets and instruments	117 €	- 170 €	77 €	- 103 €	- 96 €	- 41 €	247 €	- 192 €	17 €	48 €	- 9 €	21 €	13 €	0 €
Other financial assets	167 €	- 249 €	960 €	723 €	- 162 €	- 133 €	143 €	- 51 €	- 14 €	26 €	- 13 €	0 €	4 €	- 3 €
Other financial instruments	- 50 €	79 €	- 1,037 €	- 826 €	66 €	92 €	104 €	- 141 €	30 €	22 €	4 €	- 21 €	9 €	3 €
(-) Change in Other Balance Sheet Items	28 €	49 €	- 81 €	38 €	2 €	- 14 €	9 €	- 1 €	- 2 €	2 €	- 0 €	- 0 €	0 €	- 0 €
Post-employment and other employee benefit liabilities	28 €	49 €	- 81 €	38 €	2 €	- 14 €	9 €	- 1 €	- 2 €	2 €	- 0 €	- 0 €	0 €	- 0 €
Unlevered Non-Core FCF	688 €	- 608 €	142 €	207 €	50 €	110 €	656 €	22 €	259 €	302 €	267 €	228 €	268 €	259 €

Valuation Summary and Ratios

Financials	2022E	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F	2031F	2032F
Current Price	11.79 €										
Valuation	12.66 €	12.73 €	12.86 €	12.96 €	13.20 €						
Dividend Yield	7%	8%	9%								
ROE	5										
Core ROIC											

Multiples Valuation	Equity Value							
	Mean		Median		Min		Max	
	Historical	Forward	Historical	Forward	Historical	Forward	Historical	Forward
EBITDA Multiple								
EV/EBITDA	16,135	14,796	13,187	11,936	1,735	829	39,715	37,667
Price per share	19.46	17.84	15.90	14.39	2.09	1.00	47.89	45.42
EBIT Multiple								
EV/EBIT	19,003	15,832	13,395	10,862	2,742	1,420	65,312	56,879
Price per share	22.92	19.09	16.15	13.10	3.31	1.71	78.76	68.59
Price-to-Earnings Multiple								
P/E	13,927	7,731	12,567	6,976	3,352	1,861	32,188	17,867
Price per share	16.79	9.32	15.15	8.41	4.04	2.24	38.82	21.55

Image 1 – U.S. Renewable Energy Market 2020 - 2030

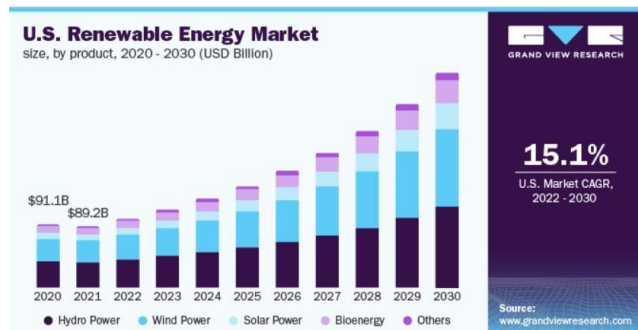
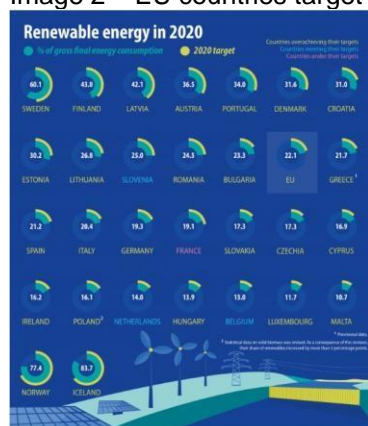


Image 2 – EU countries target on % use of renewable energy in gross final energy consumption



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Report Recommendations

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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