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Equity Valuation – EDP Renováveis

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Abstract

The renewables industry has been facing an important diffusion in the world of long-term energy scenarios. The necessary strict control over carbon dioxide emissions and the diversification of energy sources through ambitious world commitments is leading to a promising and continuously development of this sector.

The equity valuation exercise here proposed aims to explore the connection between theoretically fundamentals with the practitioners work basis.

We have designed a well theoretically supported work, with a cautious literature revision, and strongly adjusted for what equity research industry defends in practice, trying to deeply explore a more robust valuation exercise.

EDP Renováveis (EDPR) is considered to be one of the leading players in the wind industry and its valuation requires a thorough analysis of industry and company specifications, considering also the actual financial markets conditions.

This dissertation foresees a future development path of EDPR, based on its current framework, investment plan and natural redirections of its growth, as it has been assisted in the entire industry.

We forecast a standalone valuation for EDPR of €12.509 Billion, corresponding to a target price per share of €7.10.

Nevertheless, the consistent uncertainty of few main drivers' comportments and whole projects construction, a sensitivity analysis is computed in order to account the potential future of this company.

Independently of the sensitivity results of the base case, this equity valuation exercise clearly indicates a BUY recommendation.

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The Master of Science in Finance at Católica Lisbon School of Economics was one of the most important decisions in my life.

Its conclusion is expressed by the Master thesis that I expose here. It was possible to use the diversify knowledge obtained in the masters' courses that allow me to face this practical case, an equity valuation, with strong theoretically and practice fundamentals.

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List of abbreviations

ANEEL National agency of electric energy

BNDES Banco Nacional do Desenvolvimento

FiT Feed in Tariff

GW Gigawatt

IPO Initial Public Offering

IRR Internal Rate of Return

MW Megawatt

NA North America

O&M Operating and Maintenance

P.P. Percentage points

PPA Purchase Power Agreements

PROINFA Program of incentive to the electric energy alternative sources

Q&A Questions and Answers

REC Renewable Energy Certificates

ROC Renewable Obligation Certificates

RoE Rest of Europe

SG&A Selling, General and Administrative expenses

Solar PV Solar Photovoltaic

UK United Kingdom

US United States of America

YoY Year Over Year

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Introduction

The present dissertation has the purpose of presenting a trustable and professional valuation exercise of EDPR. The main objective is so to estimate a value for EDPR's stock based on its particular fundamentals. EDPR is a leading company in renewable energy industry highly supported by its integration in EDP Group (EDP), listed on Euronext Lisbon since 2008.

This dissertation answers simultaneously to different motivations. Firstly, it is desired that it provides a superior understanding of equity valuation methodologies, combining the theoretically and practice principles. Secondly, the aim of exploring a complex and interesting industry, essentially given its financial and technological oriented structure, and finally, the opportunity to place in practice the knowledge that acquired during the Master of Science in Finance.

This work is so organized in three major sections, beginning with the literature review, passing through the industry and company overview and concluding with the valuation section.

The literature review is a crucial section, exploring the state of the art, which will be the theoretically support of the dissertation. The company and industry overview develops the framework in which EDPR is inserted, underlying relevant topics to be accounted when the valuation is performed. It gives a general picture of the company today's situation, adding an important valuable analysis to understand, even superficially in some topics, the renewable energy industry. Lastly, the valuation section displays our methodology and results, explaining in detail the main assumptions behind the valuation model with a specific comparison exercise, concluding with an estimation of 2014 target price for EDPR stock.

In sum, our work designs a robust and coherent path of valuation analysis, combining the different school of thoughts with the fundamentals of the industry and the proper specifications of EDPR. The final result is an investment recommendation, a specific output that nowadays has significant relevance on investors' decisions and capital applications.

1. Literature Review

In this first section of this dissertation, it is summarized the state of the art, analyzing the existent set of models to perform a valuation exercise of a company.

Each model will be defined and explained, emphasizing the literature developed about them, their fundamentals, strengths and weaknesses, and their final results.

It is important to notice that some details regarding the valuation models are only presented in valuation section, where the company's characteristics are discussed and adjusted to the methodologies explained previously.

After this discussion, there is the necessary information to design a valuation path to evaluate EDPR, selecting different methods in order to achieve stronger conclusions.

1.1. Equity Valuation

"Valuation can be considered the heart of finance."[1].

The valuation process is a complex but useful exercise, designed individually for each company. Several academics and professionals have been focused on this process, specifically on the choice of the right valuation models, taking into consideration the different drivers from the different businesses areas and industries.

The different valuation models contribute individually to the big picture. Looking at it, it is possible to understand why different results are achieved over the models, and which assumptions do not make sense, accurate the global valuation exercise.

According to Fernandez (2013), the mechanism of companies' valuation is a critical point in the corporate finance domain, which has been developed by equity researchers and investors. More, it is also an important concept for the managers' day-by-day by identifying sources of value creation through valuation of the company and its different business units.

[1] Damodaran, Aswath. "Valuation approaches and metrics: A survey of the theory and evidence". Now Publishers Inc, 2005

Damodaran (2005) indicates that in order to make reasonable and sensible valuation decisions, it is mandatory to understand what determines and influences the firm's value, and how the best way to estimate it.

According to the author, there are four main approaches to valuation: relative valuation, discounted cash flow valuation, contingent claim valuation and liquidation and accounting valuation. In this work, it will be explored the first three approaches, once the last one is considered only for liquidation or short-term "fire sale" purposes.

1.2. Relative Valuation

1.2.1. Multiples Analysis

The valuation using multiples is one of the most popular valuation methods among financial analysts, researchers and investors, as it is reported in Asquith et al (2005) "(…) 99% of top analysts use a multiplier model for firm valuation".

"Valuation by multiples entails calculating particular multiples for a benchmark companies and then finding the implied value of the company of interest based on the benchmark multiples" is stated in Lie and Lie (2002) as a definition of the model.

In Lie et al (2001), this method is appointed as a method which facilitates the comprehension of other valuations, once communicates clearly the end result of those valuations. More, they argued that a valuation using multiples complements other valuations by calibrating their final results and helping to obtain the terminal value.

As we stressed previously, the relative valuation has two main critical points: to choose which multiples to use and the peer group selection. These critical points are considered the main drivers of the valuation and the output can vary significantly if we apply different drivers, no matter if it is a different multiple or a different set of comparable firms.

The literature has developed the necessary requirements to build a robust and consistent analysis of comparable multiples, highlighting that the principles of valuation and the empirical evidence recommend the use of forward-looking multiples instead of using trailing multiples, once the first ones are more accurate predictors of value, as it is reported in Liu et al (2001) and Kim and Ritter (1999).

The price-to-earnings (P/E) is a widely used multiple, even nowadays has been criticized because the distortions created by the different capital structures of the companies and the incorporation of non-operating gains and losses in final result. The enterprise value (EV) to EBITDA, a similar multiple focused in EV instead of share price, is considered and reported as the mandatory multiple when it is comparing valuations across companies. It is the multiple that "(…) tells more about the company's value than any other multiple."[2].

1.2.2. Peer Group

The definition of the peer group is a multifaceted and a discussed topic in literature as well. Henschke and Homburg (2009) stated that "(…) it is difficult to find a peer group which corresponds to a target firm in all value relevant characteristics". However, to define a set of comparable firms we can use a statistical tool, the cluster analysis for example, or the information that companies may disclose in their annual reports regarding their group of competitors. As it is declared in Koller et al (2005), the definition of the peers should lies on companies that have similar outlooks for return on invested capital (ROIC) and long-term growth.

Despite this method is commonly used, it is indispensable to understand the characteristics and limitations of the model in order to avoid inconsistent calculations, incoherent use of multiples and incorrect valuations, which can lead to overlook perspectives or to ignore existent risks, reason why this method is rarely used in a standalone basis.

1.3. Discounted cash-flow methods

According to Copeland et al (2000), the fact of the cash is king makes that a good valuation should be based on a Discounted Cash Flow (DCF) method. The several DCF models are reported as one of the most rigorous and secure approaches when appraising investments.

These models consist in using future projections of the cash-flows of the company and discount them at an appropriate rate to obtain the present value, which allows us to evaluate a potential opportunity of investment. Furthermore, according to Ceglowski and

[2] Koller, Tim, Marc Goedhart, and David Wessels. "Valuation: measuring and managing the value of companies". Vol. 499. John Wiley and Sons, 2010.

Podgórsky (2012), this model can be applied based on two different cash flow perspectives, the Free Cash Flow to Firm (FCFF) and the Free Cash Flow to Equity (FCFE).

The FCFF perspective refers to all resources that will be available to all financing parties, the equity and the debt holders, representing the expected cash flows from the company's operation.

After the deduction of the taxes on earnings before interest and taxes (EBIT), it is necessary to sum up the depreciations and amortizations, previously deducted, once they are tax deductible but they represent a source of capital available for the firm. The investments done by the company are after deducted through capital expenditures (Capex) and increments on working capital (NWC), getting finally the FCFF. In order to estimate the Firm Value (FV), the FCFF must be discounted at an adequate rate, the Weighted Average Cost of Capital (WACC), a term that will be discusses further on. The FV is then given by:

$$Firm\ Value = \sum_{t=1}^{N} \frac{FCFF_t}{(1 + WACC)^t}$$

The FCFE perspective refers to the amount that a firm has available to pay dividends to their equity holders, which is equal to the cash flow from operations net of all payments to debt holders.

To obtain the FCFE, the calculation process starts with the net income presented in the Profit and Losses (P&L). After, add the new debt of the company, and subtract the CAPEX and the principal repayments to debt holders. As we only are considering the resources available for shareholders, the appropriate discount rate to obtain the equity value is not the WACC, but it is the cost of equity, Re, which represents the shareholders' opportunity cost.

$$Equity\ Value = \sum_{t=1}^{N} \frac{FCFE_t}{(1 + r_e)^t}$$

Although the two valuations are calculated differently, if the set of assumptions are specific, coherent and realistic, the final value should be the same, given the directly relation stated between the FCFF and the FCFE.

$$FCFE = FCFF - Interest * (1 - t) + \Delta Net\ debt$$

Theoretically, the application of the DCF model is not a complex process, no matters what perspective it is used. However, Pinto et al (2010) argued that if we are considering levered and non-stable capital structure firms, or companies with negative FCFE, the perspective of FCFF is more trustful with the WACC approach, regarding the sensibility of the cost of equity to the capital structure's changes.

There are some practical questions that should be treated carefully, once the success of the valuation exercise may depend on them.

One of the most important transversal questions regarding the DCF analysis is the time frame to use in projections, or also denominated as the explicit period. The rule lies on the performing point of the company. Usually, the literature recommends an explicit period between five and ten years. However, in some cases that companies are already performing on their steady-state point, this period can be shorter, or longer, if we are considering outstanding growth companies.

The second important question is the definition of the second stage of the valuation, the terminal value. This term is an indispensable part of a DCF analysis and represents a higher proportion of the EV, reason why the methodology and concerns are discussed, later, in a specific topic.

The DCF analysis is highly influenced by the quality of assumptions for the forecasts presented, reason why it is stated that they should representing almost 80% of the time allocated to the valuation exercise and the computations only 20%. The DCF value is given so by the following equation.

$$DCF\ Value = \sum_{t=1}^{N} \frac{Cash\ Flow_t}{(1+r)^t} + \frac{Terminal\ Value_N}{(1+r)^N}$$

The literature indicates the DCF model as the preferred one to evaluate companies, but also underlying that some information is distorted or is not disclosed without the use of other models, as the tax shields advantages or bankruptcy costs.

1.3.1. Terminal Value

The expected future cash flows of a company cannot be estimated forever, being impossible to have an infinite explicit period. The terminal value of a company is the denominated

second stage when valuing a company based on DCF method by Cassia et al (2007), also called the continuing value. This term quantifies the anticipated value of a company at a specific future date, after the calculation of the explicit period, by computing all projected future cash flows for a longer period.

The terminal value calculation is a critical point of every DCF analysis once it usually represents a higher percentage of the estimated EV, being influenced by the forecast horizon of the explicit period and the potential future growth of the business.

Damodaran (2012) states that there are three approaches to estimate the terminal value: the market multiples, the stable growth model and the liquidation value.

The first two approaches are the most used to estimate the terminal value and assume that the activity of the company will continue after the last year of the explicit period, on the contrary to the liquidation value.

The liquidation value assumes that the operation of the company will cease at a future certain point, and it will be liquidated. The valuation of the company is an estimation of what the market may pay for the assets that the firm has accumulated, after paying its debts. However, this model presents an approach based on the book value assets, not considering the earning power of the assets.

The multiples approach refers that the future value of the company is estimated based on the application of multiples of comparable firms on present company multiples. The rationale of this method lies on the fact that the multiples today contain the expected growth performance of the company in the future. However, there are limitations regarding this terminal value calculation, given we are mixing a discounted cash flow valuation in the explicit period with a relative valuation of the terminal value, resulting a possible non-consistent valuation.

The limitations presented above drive us to understand that "(…) the only consistent way of estimating the terminal value in a discounted cash flow model is to use either a liquidation value or a stable growth model"[3].

The stable growth model assumes that firms use part of their cash-flows to perpetual reinvest them back into new assets, increasing the life cycle of the company. As it was stressed previously, the terminal value allows us to concentrate all projected future cash flows of the company in one unique value. This reason points out the reason why when the terminal value is been calculated, the company should be in its steady-state phase, growing at a constant rate.

The terminal value calculation can be adjusted depending if we are valuing equity or valuing the firm. In both cases it is assumed a constant growth rate in perpetuity, adjusting between cash flow to equity and free cash flow to the firm, cost of equity and cost of capital, respectively.

$$Terminal\,Value\ of\ Equity_t = \frac{Cash\ Flow\ to\ Equity_{t+1}}{Cost\ of\ Equity_{t+1} - \ g_t}$$

$$Terminal\,Value_t = \frac{Cash\ Flow_{t+1}}{r_t - g_t}$$

The literature presents some concerns about this method regarding the perpetuity constant growth rate. First of all Damodaran (2005) clearly presents as impossible a firm that can grow forever at a higher rate than the growth rate of the country's economy where it is. More, even the firm is a multi-national one, the limit of growth rate still is the growth level of the global economy. This adjustment will be crucial in the valuation section to make an accurate terminal value calculation.

1.3.2. Discount rate

In this topic it will be discussed one important part of the DCF analysis: the discount rate. The discount rate is the appropriate rate used to discount the future cash-flows considering the opportunity cost and the risk of the company, obtaining the present value of those cash

[3] Damodaran, Aswath. "Investment Valuation: Tools and Techniques for Determining the Value of any Asset, University Edition", John Wiley and Sons, 2012.

flows. The discount rate should be adjusted to the risk level of the company and also to the capital structure of the company.

1.3.3. Weighted Average Cost of Capital

The Weighted Average Cost of Capital (WACC) has been the widely discount rate used in DCF analysis. The WACC is a tax-adjusted discount rate, given the ability to incorporate the advantage of the corporate borrowing, and according to Fernandez (2010), it is a "(…) weighted average of a cost and a required return."[4], once it contains company's capital structure ratios, cost of debt, cost of equity and an extra input regarding mixed instruments, as it is shown in the equation above:

$$WACC = \frac{D}{D+E+P} * r_d * (1-T) + \frac{E}{D+E+P} * r_e + \frac{P}{D+E+P} * r_p$$

The limitations of this method have been discussed in the literature by several authors, considering that the WACC is the appropriate discount rate only when the capital structure of the company is relatively stable. Luerhman (1997) is one of those, stating that WACC does a poor job with companies that present complex tax structures.

As it is understood, the WACC equation has several components. Each of them is computed with specific fundamentals and models, being the most relevant the computation of the cost of equity component.

1.3.4. Capital Asset Pricing Model

To compute this component is necessary to use an asset pricing model, which allows us to yield a correct discount factor based on the level of risk of the company. The standard asset pricing model generally used is the Capital Asset Pricing Model (CAPM) introduced by Sharpe (1964). CAPM is a factor model that relates the expected required return of a security or portfolio, usually called cost of capital, with the required return appointed by the market. This model has been developed and some extensions were introduced by Fama and French (1992) and Carhart (1997), introducing factors on size and growth, and a factor over momentum, respectively.

[4] Fernandez, Pablo. "WACC: Definition, Misconceptions, and Errors." *Business Valuation Review* 29.4 (2010): 138-144.

Despite the existence of updated and robust approaches for asset pricing models, the CAPM still is the most used model given its simplicity and its utility in companies' valuations. The CAPM determines the expected rate of return of a security or portfolio, equals the sum of the risk free rate of the market, and the market risk premium, already adjusted to the company's correlation with the market through the firm's beta factor.

$$r_e = r_f + \beta_L * [E(r_m) - r_f]$$

The risk-free rate of return is most of the times undervalued when it is accessing the expected return of the security. However, a non-careful selection of which risk free to use is sufficient to influence wrongly an entire valuation. According to Damodaran (1999), the risk free rate should be a short- or a long-term risk free rate depending of the duration of the investment analysis. More, considering the government as a default free entity, the author argues that the risk free rate used for companies' valuations should be a long term risk-free government bond. The author points out two conditions when we are dealing with risk-free rates: the consistency principle and the inflation adjustment.

The first one lies on the fact that is the currency used to estimate the cash flows of the firm that determines the choice of the currency of the risk free rate. The second one states that the estimated cash flows and the risk free rate should be or not adjusted to the inflation, since both are in the same condition, real or nominal terms.

The risk-free component is used to compute the cost of equity but also the market risk premium and the beta of the company.

The market risk premium, also called the equity risk premium, is one of the most debated concepts in the literature, given its weight in every risk and return finance model. This term reflects the difference between the expected return on a market portfolio and the risk-free rate, combining three concepts: the required market risk premium, the historical market risk premium and the expected market risk premium.

According to Damodaran (1999), there are three main approaches for defining the market risk premium: the historical premium approach, the modified historical risk premium and the implied equity premium approach.

The standard approach is the historical premium approach that computes the market risk premium through the average of the historical differences between the market returns and the risk free returns over a long time period. Damodaran (1999) argues that this model only can be used if we are considering a mature market with historical data available, as it is the case of the US market.

The difference to the others approaches lies on the methodology used to calculate the market data of the specific market. However, it is generally accepted as consensus by the market, investors and companies, a mature equity market risk premium between the range 5% and 6%.

There are two main approaches talking about the adjustment of market risk premium for country's risk premium or similar risks.

From Damodaran (1999) point of view, the country risk premium reflects an extra risk in a specific country, which should be added to the base premium for mature equity market. This term accounts the country's default risk, but also many equity factors, as stability of the country's currency or country's politic situation, and the adjustment procedure is through the bludgeon, the beta or the market lambda approach.

The second approach states that the country risk should be directly adjusted in the cash flows, creating scenarios for the different risky situations that you could face in a specific country. To each scenario, positively and negative, it is attributed a specific probability of occurrence, leading to a resulted cash flow already adjusted.

The last factor of the equation is the beta. This factor measures the correlation between the securities' or portfolios' volatility with the whole market volatility. Looking to the beta, we can analyze the firm's exposure to the market risk, which means how securities' returns will respond to market movements.

Regarding the calculation of the beta, there are several approaches. Damodaran suggests a regression of the company's stock returns on the market returns, paying attention to three different concepts: the market index, the frequency of the data and the time frame.

The market index used should be considered as a benchmark for the company and it should be a weighted market index. The frequency usually used by practitioners is weekly or

monthly returns, once daily returns are negatively correlated even a higher frequency allows more observations. The time frame is a tricky concern once on one hand with a higher time frame we obtain more observations and so a stronger regression, on the other hand, the characteristics of the company may be different along this time frame and the regression will be biased. The following relationship permits us to estimate the beta levered for the company.

$$r_i = \alpha + \beta * r_m$$

The beta term has a directly relation with the leverage level of the company. The incremental risk in case of the company has debt is reflected directly in the unlevered beta of the company, arising it. Through the Damodaran suggestion, the obtained beta after the regression is the levered beta of the company, and consequently, to obtain the unlevered beta for the CAPM calculation of the cost of equity, it is needed to rearrange this equation to do so.

$$\beta_L = \beta_U * [1 + (1 - t) * \frac{D}{E}]$$

The second strategy also explained by Damodaran to estimate the unlevered beta of a specific company is the bottom-up strategy[5]. This strategy is driven by a peer group, which should be diversified as possible inside the industry segment, once it is able to capture all effects of the industry risks overall the world, assessing a better unlevered beta. After the deleveraging of the betas of the peer group, it is computed the average of unlevered betas, further leverage adjusted to the financial profile of the company, getting the company's specific levered beta.

1.3.5. Adjusted Present Value

The Adjusted Present Value (APV) model appears as the preferred model to use in substitution of the DCF/WACC model, regarding the limitations already discussed.

The APV valuation model calculates the value of the company as if it is solely equity financed, adding the financing benefits in a second stage of the valuation exercise taking into consideration the bankruptcy costs. Indeed, APV provides important information for

[5] See Appendix 1

management teams, making possible to analyze the contribution of each of source of value to the company's present value.

Moreover, according to Luehrman (1997), this model has the advantage of performing well when WACC approach works, but also when the latter does not perform so well. Despite the fact that it requires less assumptions then the DCF model, the APV yields less serious errors when compared with the WACC.

The application of the model is not a difficult process, but it is necessary to pay attention to some critical points, as the discount rate used, the debt benefits and the influence of the bankruptcy costs.

The first step is partially shared with the DCF model, and it consists in forecasting the future cash flows and discounts them at an appropriate rate. After this step, the valuation exercise incorporates the different fundamentals of the models. To discount the obtained cash flows is used the unlevered cost of equity instead of the WACC, once it is assumed that the company is 100% equity financed.

The second step focus, individually, on the big picture of the company's debt. In this stage, it is forecasted the debt repayments and interest expenses, being consequently estimated the present value of the interest tax shields (PVITS).

The PVITS concept is the answer to the question "Why a company with debt in its structure worth more than the same company solely equity financed?". It is true that a levered company has repayment obligations and interest expenses to pay. However, the company saves cash flows through the reduction of income taxes resulting from the debt tax-deductible condition. This condition increases the value of the company until a certain point, the optimal debt-to-equity ratio.

After this optimal point, an extra element gains relevance, the distress costs. Increasing debt levels also increases the distress costs of the company, and overpasses this optimal level, the expenses with distress costs are higher than the interest tax shields. This discrimination of the interest tax shields is the remarkable difference between APV and DCF model, which accounts it on the WACC.

According to Fernandez (2004), to estimate the PVITS should be applied the following equation, despite the fact that it is only valid if the company does not increase its debt level.

$$PV(ITS) = \frac{D * r_d * T}{(1 + r_d)^t}$$

The third and last component to compute the company's value through the APV model is the expected bankruptcy costs. The bankruptcy costs can be defined as all expenses incurred by the firm if it is unable to repay its outstanding debts, as the legal fees or the lawyers' fees.

Despite the fact that there is not an explicit model to estimate the bankruptcy costs, the accurate estimation is crucial to have a correct valuation and not a mislead one. The common formula used to estimate is appointed below.

$$Expected\ Bankruptcy\ Costs\ (EBC) = Probability\ of\ Default * Bankruptcy\ Costs$$

The last equation includes two inputs, the probability of default (PD) and the bankruptcy costs, which do not generate consensus in the way how to achieve them. The bankruptcy costs are difficult to concretely measure as it was stressed previously, given the nature of those expenses. Although this fact, Branch (2002) states that the distress losses may be equal to 28% of the pre-distressed value of the company, reason why, according to the author, these term is imperative in defining capital structures and discussing required risk premiums.

In order to achieve the PD term, there are some sources to do that. Damodaran suggests a methodology based on the traded bond rating of the company and different interest coverage ratios as a good proxy, existing other sources that establishes a certain probability of default given a specific industry or a market segment, as Moody's.

The last step of the APV valuation is to achieve the levered value of the company, based on the unlevered company's value, the PVITS and the EBC previously calculated.

$$V_L = V_U + PVITS - EBC$$

1.3.6. Dividend Discount Model

The Dividend Discount Model (DDM) was one of the older contributions to the valuation theory, introduced by Williams in 1938. This model is also called the Gordon growth model given the adjustment made by Gordon and Shapiro (1956).

The DDM is a straightforward valuation technique that provides the company's stock price based on the present value of the sum of all expected future dividends payments, a useful tool for investors' investment analysis.

According to this methodology, the company's stock price today is given by the next year's dividends discounted by the appropriate discount rate, the cost of equity required for that company, minus the expected constant growth rate of dividends in perpetuity, as it is stated below.

$$Value\ of\ Stock = \frac{Expected\ dividends\ in\ next\ period}{(Cost\ of\ equity - Expected\ growth\ rate\ in\ perpetuity)}$$

Although the simple application of this model, some literature criticize this model as it is. This approach is directly related with the decision of paying dividends and due this fact we should be aware to some facts.

First of all, for some companies, the decision of paying dividends is exclusively political, which can lead to a non-rational valuation. Moreover, there are companies that prefer do not pay dividends, or only declare extraordinary dividends when in a particular year they have a lot of money to distribute, as we had seen in Microsoft or Apple some years ago, which makes impossible the pricing of the stock. Finally, the assumption of constant dividend growth rate is not realistic for the majority of the companies and "the practitioner knows that in reality dividends simply do not growth at a constant rate forever."[6]. In these cases, it is difficult to perform a valid valuation by using the standard DDM, so it has been discussed some adjustments.

Molodovsky et al (1965) suggest using a more realistic but complicated multistage growth model to accurate the constant growth rate of dividends assumption. In this model there are

[6] Fuller, Russell J. "Programming the Three-Phase Dividend Discount Model." *The Journal of Portfolio Management* 5.4 (1979): 28-32.

three phases, each of them with a specific comportment of the dividend growth rate. This growth rate pattern for dividends starts with a constant growth rate, followed by a declining linearly growth rate period and finally another but lower constant growth rate that persists for the company's life.

The DDM has been refined by practitioners and academics, in different expositions of different multistage models or different methodologies. However, it is noticed that the application of these models nowadays can easily lead to misleading valuations, if the companies do not fulfill certain characteristics or a certain framework.

1.4. Profitability models

The performance of the company is an important item for investors and for the market. One of the drawbacks of the DCF models lies on the fact that the cash flows do not give specified information regarding the company's performance. In this section, it will be discussed two methods based on profitability, which allow us to realize when and how the company generates value.

1.4.1. Economic Value Added (EVA)

The EVA is a derived model from DCF and it measures the residual income through the difference between the company's cost of capital and its return on capital.

The EVA determines that the value of a company is equal to the sum of the book value of the invested capital and the present value of the future economic profit generated. Obviously, in order to generate economic profit in the future, the Return on Invested Capital (ROIC) should be higher than the WACC. As it is understood, this model also requires a set of assumptions to create a coherent and consistent valuation exercise, as we have seen in DCF. The Invested Capital (IC) should be the last value available, and the ROIC and the WACC should be carefully estimated.

$$EVA = (Return\ on\ Capital\ Invested - Cost\ of\ Capital) * Capital\ Invested$$

1.4.2. Residual Income (RI) or Dynamic ROE

The residual income is a strict similar model to the EVA, with the same reasoning and similar calculations. However, its perspective is over the equity rather than the firm perspective, reason why in this model it is compared the return on equity (ROE) and the cost of equity

(Ke) of the firm. As we presented previously, this model has an equivalent DCF model that is the DDM.

$$V_{eq} = E_0 * \sum_{t=1}^{\infty} \frac{E_{t-1} * (ROE_t - K_e)}{(1+K_e)^t}$$

These models allows us, as it stated previously, to distinguish when and how a company is generating economic profit, something that DCF analysis does not determine, but also they have their disadvantages. The main drawbacks of these profitability models lie on the fact that are based on accounting information, and if the latter does not contain all income and expenses, the valuation will be misled. More, the optimal time frame of these models is short term forecasting reason why it is not universally used in longer time valuations.

1.5. Option Pricing Theory

The Option Pricing Theory offers a supplement to the net present value rule and other discounted cash flow approaches, valuing a project that provides some type of flexibility, real options.

The two models that have been used to explore the real options valuation are the Black-Scholes and the Binomial Model, each of them with specific derivations.

Fernandez (2002) reported that real options splits in contractual options, growth or learning options and flexibility options. More, he argued that real options valuation is based on riskless arbitrage and only should be applied if it is possible to create a portfolio with the same risk-return relation.

According to Trigeorgis (1993), the recent literature recognizes that DCF approaches cannot capture the management team's flexibility value to adjust their decisions in response to the unexpected market developments.

Nowadays, management teams currently face changes in their expectations regarding the projected cash flows of an investment or project, since the actual market is characterized by multiples sources of uncertainty. These constraints should force the management team to adjust their decisions in order to capitalize the opportunities and mitigate the losses

considering an investment project. An example of this management decisions is the operation of a mining firm is directly related with the future oil price.

The use of this method to valuate wind farms is currently present in the literature, using different methodologies inside of option pricing theory, as it is stated with Méndez (2009) and Venetsanos et al. (2002).

One of the generic problems of these models is the multiple sources of uncertainty that influence the real asset investments and difficult the accuracy of the models' inputs, therefore the calculation is difficult. However, these models allow the managers to identify the sources of uncertainty and how it will be solved in the future, by decomposing an investment into its options and risks components.

Although real options valuation has been used more often, as we stressed previously, there are specific valuation exercises where this approach should not be used.

1.6. Note of cross-border valuation

Regarding EDPR valuation includes a cross border valuation exercise, it is mandatory to explain which points of view are considered in this exercise. According to Kester and Froot (1997) and Koller et al. (2010), there are several questions when we are valuing international operations, as forecasting cash flows in foreign currencies or estimating the cost of capital in foreign currency among others. The more influent issue is, among others, the currency in which the valuation is performed and which methodology is used over the entire exercise. Koller et al. (2010) states a general rule that we must have kept in mind: independently of the currency methodology used to project the cash flows, the intrinsic value of the company should be equal. It also suggests that there are two methods for forecasting and discounting foreign currency cash flows: (i) spot rate method; (ii) Forward rate method.

The first one performs the entire valuation in the foreign currency, projections and the discount rate, converted lastly the present value of the cash flows into domestic currency through the spot exchange rate.

The second one performs the projections of cash flows in the foreign currency, converting in a year-by-year basis those cash flows through the relevant forward exchange rates, being after discounted already at a domestic currency based rate.

Summarizing, the most important idea is to be coherent and to perform correctly the different methods displayed, over the different valuation's stages.

1.7. Note of valuation of Utilities

Given the specificity of the utility industry, there is some literature arguing that some differences on valuation should be cautiously analyzed.

According to the some literature the regulation associated to this industry can change the rationale of some important variables, as market values, book values and earnings as it is stated in Blacconieri et al. (2000).

The common regulation for utility industry is characterized by constant and pre-defined revenues stream and pre-agreed cost expenses, being possible some kind of subsidies in order to achieve a fair rate of return, higher than the total capital cost.

This fact could distort the required return concept, presenting fundamental differences between "investor rate-of-return expectations and regulatory commission rate-of-return (…)"[7].

The utilities business' structure concedes a strong visibility of generated cash flows combining a common low activity risk, with lower asset betas. The operating activity has a strong impact on valuation, highlighting some variables as the EBITDA margins or the high coverage ratios.

Some literature, as Menegaki (2007) suggests that alternative valuation methodologies for utilities companies should be applied in order to capture more effects rather than economic ones.

1.8. EDPR – Theoretical assumptions

Considering the several literature points previously explored in this section, it is fundamental to define a specific framework for the valuation exercise. This framework is indispensable to refer in which approaches and models the valuation will be based on, considering the EDPR characteristics.

[7] Holmberg, Stevan R. "Investor Risk and Required Return in Regulated Industries". *Nebraska Journal of Economics and Business*, Vol. 16, No. 4 (Autumn, 1977), pp. 61-74

Regarding the discount model, our decision is based on a discussion with the executive director of EDP that explained us that the capital structure will be variable over the next years. This fact implies that was not reasonable following a WACC valuation method, being decided to follow an APV discounted cash flow method for the valuation exercise.

This model will be based on different business units, complemented with a unique financing plan. For the valuation of business units, we will use the unlevered cost of equity supported by Damodaran's point of view adding, if necessary, a specific country risk premium for different business units, using simultaneously the forward rate method for cross-border valuation.

The relative valuation is the second methodology applied to EDPR equity valuation. This method will allow performing a coherent comparison between the two EVs, the APV one and the industry competitors' result, analyzing critically differences or similarities of the expected values.

In the literature review, we have presented more few models that we will not include in this dissertation based on few justifications. The DDM technique requires a certain framework regarding dividend policy and potential dividends growth that is not expected given a high uncertainty, which possibly originates a misleading and non-coherent result. The EVA and the RI have a set of pre-defined requisites that are not met given the structure of our APV model, as the WACC requirement and the short-term projections. Finally, the option theory is applicable for this type of valuation, however the aim of covering all EDPR's operating markets in valuation and the uncertainty and complex calculations under the majority of the necessary inputs to build this model, influencing us to reject this possibility and focus on the other two models.

2. Industry and market review

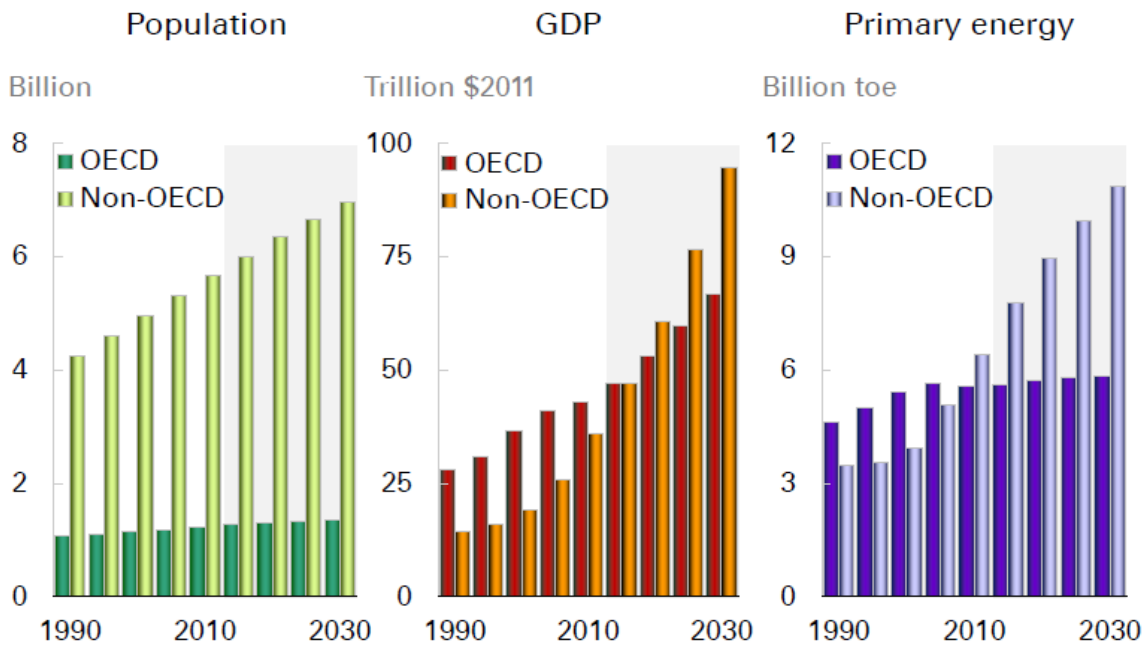
The renewable energy industry has facing in the last years an economic boost responding directly to the overall shift to green sources of energy by the main world economies.

In this section, we present an overview of the renewable energy industry, exploring in more detail the wind industry, the core business of EDPR. We will analyze the markets trends, the main business characteristics, future growing path and business risks and opportunities. Additionally, we present a review of EDPR, its structure and development model, designing a company framework of the last results and future strategy.

2.1. Renewable Energy Industry

According to the BP Energy Outlook 2030 (BP report), the worldwide demand for energy will be growing for the next 15 years, driven by the increasing income level, around double in 2030, and the world population evolution, almost more 1.3 Billion people consuming energy.

Figure 1: World Energy Drivers



Source: BP report

The world primary energy consumption will be reached 1.6% growth/year, accompanied by the urgent necessity of protecting the environment, reducing the air pollution and CO2 emissions and other pollutants as well. In 1997, the Kyoto Protocol was the first step of the

world climate change discussion, considered at that time a milestone regarding the world environment policy. However, the fact of US did not sign the protocol become its overall impact weakened.

The protocol intentions were reducing the greenhouse gas in atmosphere, by targeting maximum lower quantitative values of emissions to the atmosphere to industrialized countries, attributing extra taxation if they do not fulfil this value. On the other hand, the intentions for developing countries were less restrict, once it is understandable that social and economic developing goals entered in conflict with those environment goals.

Recently, the European Union revised upwards the 2020 target to 20%[8] of its total energy getting from renewable resources, including wind, solar, hydro, geothermal and biomass as well, making possible a stronger reduction of greenhouse emissions but also a necessary diversification in the energy sector diminishing the dependence of fossil fuels.

According to the Global Wind Energy Council (GWEC) report, the main aspect nowadays regarding energy constraints is to find the optimal solution to meet the future energy needs with the necessary rearrange of energy mix, being sustainable and economically advantageous. Over the last 10 years, the power sector fuel mix has changed significantly, given the higher contribution of the non-fossil fuels to this performance. Analyzing the BP report, the renewables including biofuels are "the fastest growing fuels"[9] presenting a 7.6% growth rate per year between 2011 and 2030. Regarding fossil fuels, gas presents higher growth, around 2%/year, followed by coal and oil, 1.2% and 0.8%/year respectively.

Renewable energy has demonstrated a strong and consistently performance path given the already mentioned necessity of finding alternative and efficient sources of energy, as it is stated in BP Report through the analysis of the growth rate and share evolution of renewables in 2011-2030 period. This path was boosted by favorable regulations and incentives schemes adopted by several countries/governments to supporting ambitious renewable energy values compared with their total production. Based on this set of incentives combining the continuous falling of technology's costs plus the impact of recent

[8] European Commission – Directive of the European Parliament and of the Council, COM (2012) 595 Final
[9] BP Energy Outlook 2030.

crude and carbon prices comportment, globally help to framework the presented stronger growth rates of renewables.

According to KPMG Taxes and incentives for renewable energy (KPMG report), it is recognized that renewable energy delivers several benefits for industries, markets and countries, summarizing to the global economic representatives.

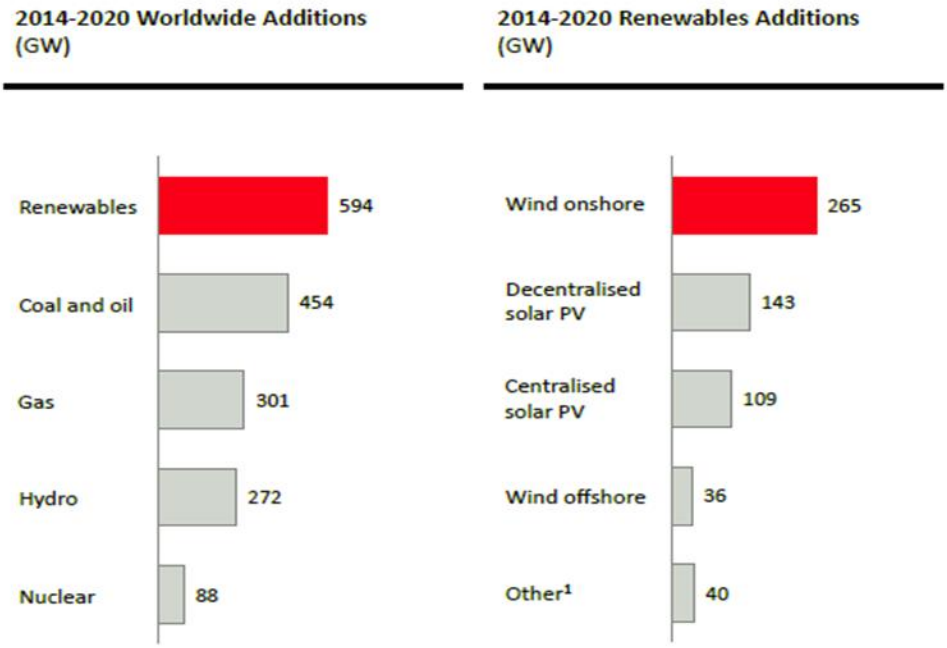
First of all, renewables allow more diversity of supply sources of energy given the increasingly demand, and concede capacity to reduce the importations of fossil fuels, increasing the security and diversity of energy. Secondly, renewables has an active role in environment protection and economic growth, contributing to the reductions of CO2 emissions and being an important part of different countries' recovery economic plans, namely associated with significant job creation and lower energy bills. Finally, responding to a continuously higher demand of electricity and to service part of population without access to electricity, renewables increase the access and affordability of energy.

According to the KPMG report, renewables trends for 2014 have been suggesting a year of industry's maturation based on changing investors options, lower values of global investments, the government policies, the role of emerging markets and the develop of other subsectors of renewables.

Also the BP Report underlying this idea, considering that renewables face a future set of challenges, leading by the key growth limitary factor, the affordability of subsidies. Diminishing investment costs allow maintaining the subsidy burden at a sufficient level to incentive the renewables scale up. Nevertheless, it is stated that renewables are expected to maintain a growing path, supported essentially by emerging markets once they are able to sustain higher growth rates and significant profitable opportunities. Parallel, the subsidies issue is gaining relevance in the market and in the industry analyses, due the fact it is an important part of the return equation and investment projects decisions, justification for shifting business focus of major renewables companies. EDPR is one of these companies stating that its expansion plan will focus mainly on emerging markets, Brazil and now Mexico, and US and Canada.

According to the data presented by EDPR, renewables will represent the higher amount of additions regarding different type of energy sources, almost 594 GW between 2014 and 2020. More, inside renewables segment, the wind onshore is largely the source of energy with more additions achieving nearby 265GW, followed by solar PV – decentralized and centralized- and wind offshore.

Figure 2: Worldwide and Renewable Additions



Source: EDPR Investor Day 2014

The core competencies of EDPR are focused on wind energy as we already explained above, reason why we will explore now in more detail the wind energy industry, its performance drivers and evolution, discussing the main trends and possible future options of this industry in several different markets.

2.2. Wind Energy Industry

2.2.1. World portfolio – Re-shifting of installed capacity

According to the World Wind Energy Association (WWEA) – 2014 half-year report (WWEA report), since 2011 the wind world capacity registered a successively increase, underlying that the total installed wind capacity expected for end 2014 will achieve 360.000 MW, representing an annual increase of 7%.

Figure 3: World Wind Capacity 2011-2014 (MW)

Source: WWEA 2014 Report

Summarizing all reasons appointed to the development of renewables, the wind energy development bases essentially on the economic advantages, the increasing competitiveness relative to others energy's sources and pressing necessity to mitigate air contamination and climate changes with emission free technologies.

The wind market of energy is dominated by the five wind traditional countries: China, Germany, US, Spain and India. These countries represent almost 72% of the total world wind capacity, being responsible for 62% of the total capacity additions in first semester of 2014[10].

The dynamism of the market is extended to all continents, with new installations in South Africa and other Africans countries, but also an increasing of capacity in Brazil, Sweden, Poland and Australia.

Firstly, the Asiatic market accounts 36.9% of total installed capacity in the world, crossing the share of Europe of 36.7%, confirming the boost that Asiatic countries are experiencing. China and India are the responsible for that achievement since they present optimistic prospects given new ambitious plans for wind energy developments. The contributions of this market are only constrained by the nuclear lobby that yet exists in some countries, as Japan or Korea, avoiding the clear industrial and economic advantages.

Secondly, the European market is largely leaded by Germany, with a total capacity around 35.5GW. Spain, UK, France and Italy complete the Europe top five based on installed

[10] WWEA Report

capacity. However, the additions of new capacity are showing relative stabilization in some countries, as Spain and Italy, and a continuous increasing in others, as France, Sweden and UK. This situation is justified by the expected revision of 2030 European renewables energy targets and the clarification of the Ukraine situation.

Thirdly, the North American market faced a dramatic decline during the first part of 2013 year, regarding the uncertainty over the extension of Production Tax Credit (PTC) and Investment Tax Credit (ITC). PTC and ITC are similar fiscal incentives to renewable producers, remunerating the production and the investment, respectively, being updated every 2-3 years, as the MACRs incentive as well[11].

After the approval of the incentives extension, the market has started its recovery based on a higher competitiveness and increasing support schemes, even the signals sent by the federal level were not positive as expected. Canada is assisting a growing phase, installing more 92% in this first semester compared with the first semester of previous year, helping the overall development of the whole region market, but more important, becoming "the sixth largest market of new wind turbines worldwide"[12].

Fourthly, the Latin American market is essentially dominated by Brazil. Brazilian market represents the 13th largest user of wind energy, accounting a total capacity of 4.7GW given an impressive growth rate of 38.2% in this 1st semester. It is expectable that Brazil achieves the top ten countries with more installed capacity in the end of 2014, being possible that other Latin American countries emerge with modest growth levels.

Finally, the offshore market starts appearing as the next global movement for the wind industry. The Roland Berger Work states that offshore will be crucial for European countries in order to achieve the climate and energy targets pre-defined to 2020, namely the 40GW installed offshore capacity. It also argues that offshore has several advantages that justify this growing strategy. Firstly, the maturity of the wind industry; secondly, offshore seems to be the best solution for countries with higher population density; and finally, it presents higher availability than wind onshore, and larger room for improvements regarding costs reductions.

[11] Appendix 13
[12] WWEA Report

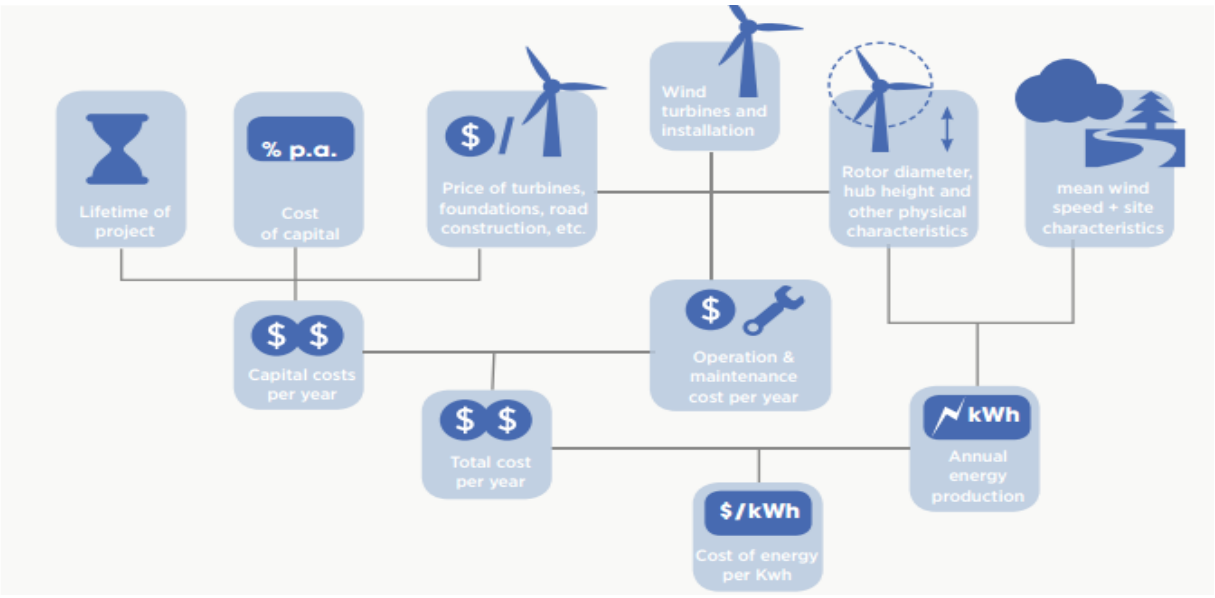
2.2.2. "Are renewables energies a luxury?" – Cost competitiveness

Renewables energies – wind onshore specifically – create a unique opportunity to policymakers develop a solution for the related problems with conventional technologies.

Wind is nowadays a cost competitive source, as we will explain further, with a general high level of availability, even at different speeds levels based on different geographical locations. It is important to underling that wind is a zero marginal cost technology, representing a comparative advantage vis-à-vis coal, nuclear energy or natural gas once it is cheaper, in first plan, and in second plan, it creates a protection from fuel prices and government decisions uncertainty.

The decision in which technology to invest in, conventional or renewables, it is one of the most debated questions in utilities industry and it has dividing the market. The literature states that for this specific analysis, it should be used the Levelised Cost of Energy (LCOE), "(…) the primary metric for describing and comparing the underlying economics of power projects"[13]. LCOE combines all expected lifetime costs, since construction, operational and financial, required to guarantee wind farms fully operation, and the expected revenues and production streams. Both cost and revenues are adjusted to the inflation and the set is discounted to obtain the present value.

Figure 4: LCOE of Wind industry derivation



Source: IRENA report

[13] IRENA, "Renewable Energy Technologies: Cost Analysis Series – Wind Power", Volume 1: Power Sector, Issue 5/5, June 2012

As we can analyze from the graph above, in terms of LCOE, wind onshore competes with all technologies, getting a LCOE of €68/MWh. The LCOE of wind onshore is lower than some conventional energy technologies, as coal or nuclear, due the fact of a decreasing investment cost per MWh, based on scale economies and technology progress, and also overall increasing its competitiveness.

More, EDPR indicates that onshore wind projects with high load factors are already competitive with new combined cycle gas turbine (CCGT) power station[14], a truly competitive alternative energy source, even there are renewables technologies that must develop their mature state and continue to increase their competitiveness to be a reasonable future solution.

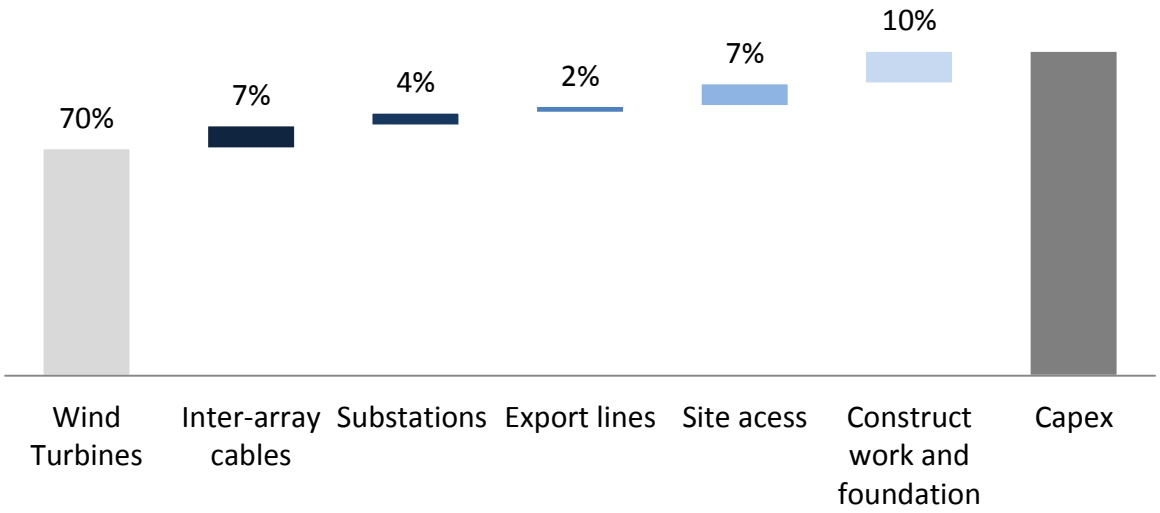
The load factor is an important element when we are analyzing the performance of a wind farm, being influenced by the turbines characteristics, wind resources and consequently achieved total production. It is usually accepted an average value between 25% and 30%, even it can change widely considering different geographical regions, different wind resources, or even different turbines as it stated by the Partnerships for Renewables and confirmed further in our valuation, in EDPR operational case.

According to the IRENA (2012), the wind industry faces a relative simple structure of costs when is starting a new project: Capital Costs and Operating Costs.

On one hand, the capital costs, or usually denominated Capex, aggregate the expenses of wind turbines, foundation, grid connection, planning & miscellaneous, among others. On the other hand, operating costs aggregates the Levies and Opex, being the latter usually segmented in O&M, Personnel costs and SG&A.

[14] See Appendix 12

Figure 5: Capex Wind Onshore breakdown



Source: E.ON Wind Factbook

It is noticeable the parallel path existing between wind energy industry and the wind turbines industry. Bearing in mind a construction of an onshore wind farm, the wind turbines represents around 70% of capex during the construction phase and during the lifetime of the project represent a fixed maintenance part of O&M total costs, accordingly to E.ON Wind Factbook[15]. The importance of strong agreements and competition among turbines suppliers is so justified, being the base of future substantial reductions regarding the required initial investment on wind farms.

2.2.3. Regulatory systems

One of the main discussed assumptions regarding renewables is that the late are expensive compared with other technologies, given an analysis between renewables costs and electricity wholesale market prices. Renewable technology has marginal variable costs and currently a set of priorities regarding the market, as preferred injection of production in the market.

The wholesale market pressures the companies' variable costs and creates competition among entities, benefiting from the pressure to lowering the wholesale price, tending to zero when there is a strong renewable production[16].

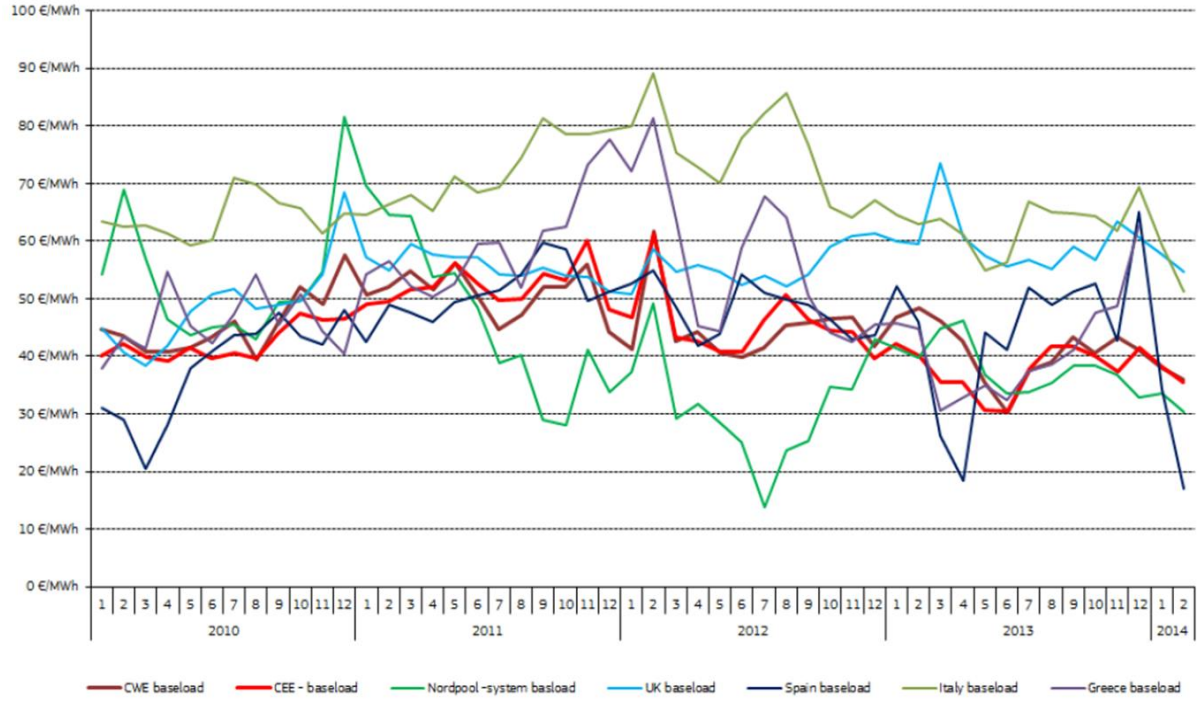
[15] See Appendix 11

[16] EDPR's example in Spain, where with high wind generation (December 25th 2013), the wholesale price achieves €5/MWh

However, EDPR argues in its annual report that this comparison is distorted once it is compared the renewables energy costs with variable costs of conventional technologies, ignoring the benefits brought to the market system above mentioned and the long term sustainability of technologies.

Electricity generation is a capital-intensive industry with a fixed cost structure that is exposed to variable wholesale market price. This fact pressures the long term sustainability of technologies if the wholesale prices are not covering their costs. According to EDPR, this is the actual situation of several conventional technologies that is solved by paying an additional extra remuneration above the market price.

Figure 6: Wholesale Electricity Prices in Europe (€/MWh) 2010-2014



Source: European Commission Report

Due the fact the investment costs are outside of this discussion, the regulatory systems were established in order to reduce the attributed risk to the investors of this type of investments.

The wholesale market volatility and the uncertainty regarding the wind farms returns do not allow stability and visibility, two conditions that are essential for this type of projects. These required conditions are so translated in a possible set of incentives as blending mandates, quotas, portfolio obligations, tax credits or FiT, in order to offer a higher return than the market, covering the verified costs.

More, requiring predictable cash-flow streams, it is only possible with ex-ante competition and negotiation, namely auctions or long term PPA, being the demand driven by regulators and the private entities to fulfill the consumption needs.

The possibility of gradually installation allow starting generation power immediately after the grid connection of the first turbines is concluded, contrarily to the conventional energies that only start operation when the power plant is fully installed.

Considering the rationale behind, long term agreements based on a balancing costs condition increases the competitiveness and provides stability to the returns' streams, which lead to a more efficient projects' installation, a fair remuneration mechanism to generators of electricity, decreasing required return by the investors, and finally, but the most important fact, a decreasing on electricity tariffs for final consumers.

2.3. Macroeconomic Framework

The macroeconomic mood is an important condition for this industry's performance path, once reflecting the consumers' income capacity, global levels of investment, environment policies, commodities prices evolution, among others.

Actually, the Eurozone economy is presenting stronger results than it was expected, since the employment to the economic sentiment indicator, the industrial data and the growth profile, similar scenario for US. More, it is living a period of dangerous lower inflation, facing already in some countries deflation pressures, which obviously have a negative impact on EDPR's results. Inflation is for EDPR a key driver linked directly to remuneration schemes, which majority are inflation-indexed revised every month, and to operating costs as well.

Inside macroeconomic key drivers for EDPR business, we also examine the exchange rates evolution, once EDPR's portfolio as we already mentioned is exposed to non-Eurozone countries, as Romania (Leu), US (Dollars) or Brazil (Reais). The significant activity exposition to non-euro markets and the volatility of exchange-rates lead to possible negative impacts on general results, reason why EDPR has a risk management strategy based on debt in the same currency and financial derivatives instruments in order to mitigate this risk.

Financing market conditions are extremely important in this activity, given it is a highly leverage business. Recent macro developments allow decreasing dramatically the level of

interest rates, namely a reduction on the government bonds and the EURIBOR rates. Consequently, the financing costs on the market for wind projects are now relatively lower, given the lower risk-free rates and lower required return of debt and equity holders for the same type and structure of the wind projects.

2.4. Company Overview

EDPR is a global renewable energy player and the third-largest wind energy producer[17], focused on the production of energy from renewable sources. The core business of the company is the onshore wind energy, being responsible for development, process and maintenance of the wind and solar power stations. For assets' management purposes, EDPR is structured in three business platforms: Europe, North America and Brazil.

EDP Renewables North America, EDP Renewables Europe and EDP Renewables Other Regions are the connector entities that provide the necessary balance between the global leadership and the local approach, fact that is fundamental to guarantee a high level of capability to develop and achieve the expected objectives in the different markets by managing the different available assets.

The creation of EDPR was a natural consequence given the strategic growth path and future investment plan of EDP Group, which have started with the installation of the first MWs during the last decade of the 20th century. This unique relation framework with EDP will be explained in shareholder structure, once it is a very important dimension when EDPR is being analyzed.

EDPR was listed in Euronext Lisbon since June 2008 through an IPO operation, immediately after the company's creation. It was a successful operation, which could be understood as a confident signal from the investors and the market for the ambitious future growth plan of the company.

2.4.1. Shareholder structure and share performance

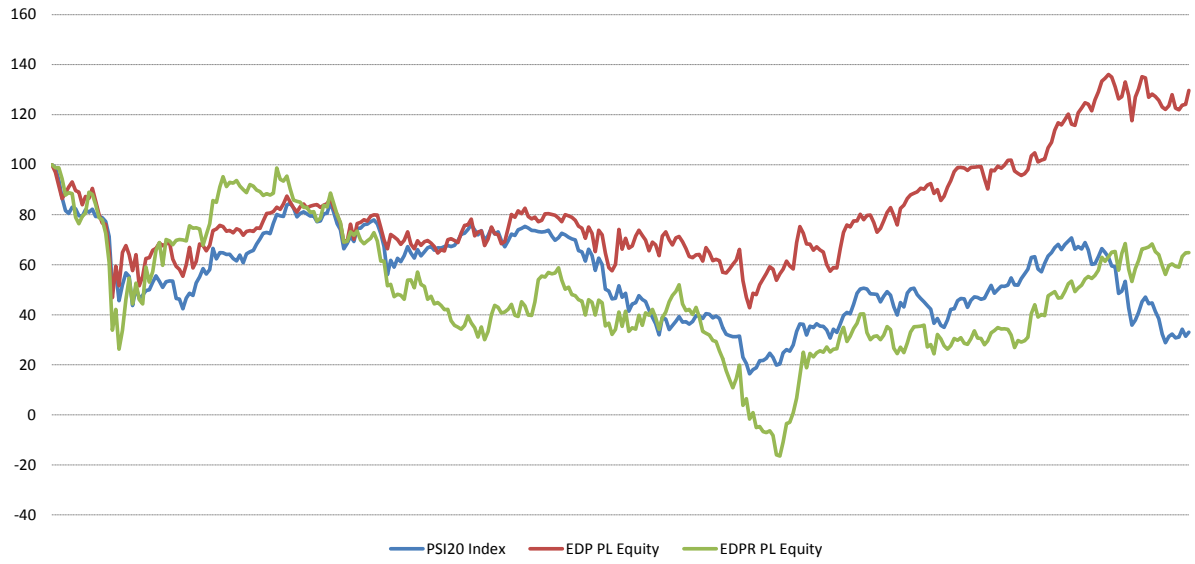
After the IPO operation, EDP maintains as the main shareholder of EDPR, in terms of ownership and control of voting rights, aggregating nowadays close 77.5% of the company,

[17] See Appendix 2

62% through a directly stake and 15.5% through Hidrocantábrico, a 100% controlled Spanish entity. The remaining 22.5% are a free float stake, owned mainly by institutional investor more than private ones. The performance of EDPR and EDP is presenting above as PSI 20 Index as well, since the IPO operation of EDPR.

Figure 7: Stock performance over the period 2008-2014

(Monthly data)



Source: Bloomberg

Naturally, it is relevant for this dissertation the importance of EDP when are analyzing the strategic and financial decisions of EDPR, knowing that any decision could be taken without approval from EDP's executive team. Regarding the debt profile and leverage conditions, this framework highly connected to the EDP represents also an advantage for EDPR, getting the benefits of the reputation and the position of the parent company faced by the markets.

The importance of EDP is unquestionable, reason why the last entrance in shareholder structure of EDP through the acquisition of 21.35% of China Three Gorgeous (CTG) is followed with special attention. This operation is significant for EDPR, essentially justified by two aspects: i) CTG is looking for potential partnerships in renewable sector, focusing on quality projects that generate stable cash flows; ii) CTG has a financial and liquidity capacity that allow to create ambitious capex programs and to develop the self-funding pillar of EDPR's future strategy.

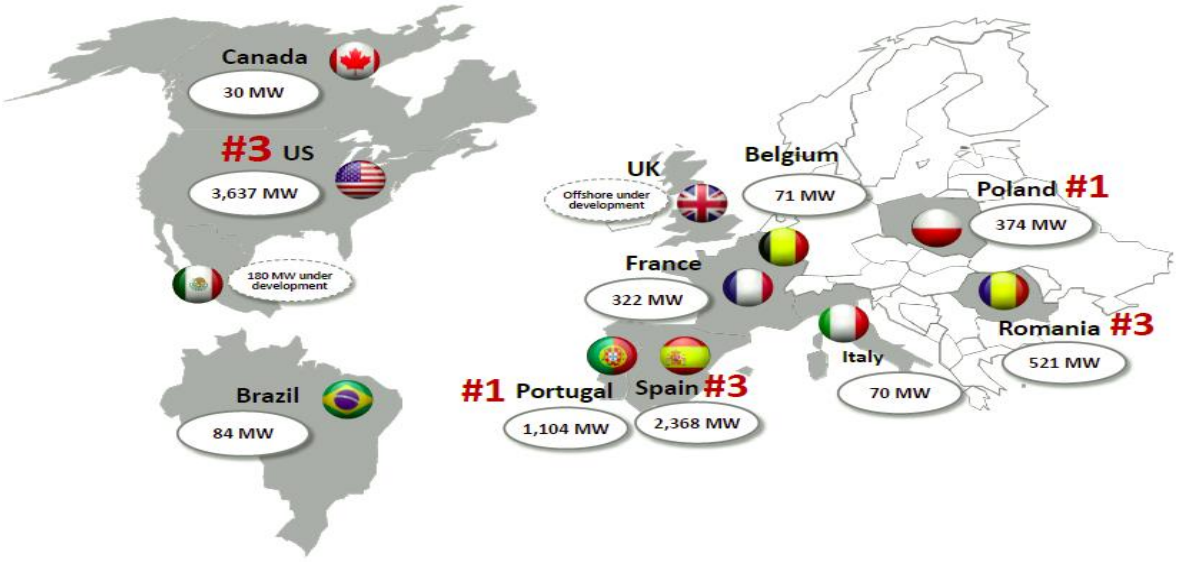
In the Investor Day presentation, EDPR has renewed the desire of maintaining its dividend policy between 25 and 35%, which is taking into account in the valuation set of assumptions. Over the last two years, EDPR had paid around €35 Million in dividends each year, representing €0.04 per share and a 28% and 26% pay-out-ratio, respectively.

2.4.2. The top quality portfolio

The portfolio of EDPR is characterized by diversification, quality plus profitability, and a solid generation of cash-flow, only possible given the restrict management EDPR's program of its core competencies and its standards of excellence, avoiding a risky and instable profile.

In September 2014, EDPR portfolio is split among ten different countries, totalizing 8.6 GW of installed capacity. The portfolio includes EBITDA consolidated capacity, but also all corresponding MW stakes that EDPR has in other companies, as it happens in Portugal with the ENEOP – Eólicas de Portugal, Spain and US, accounting 834MW of equity consolidated capacity already installed.

Figure 8: EDPR's Portfolio September 2014



Source: EDPR Investor Day 2014

The performance of the company is supported by the competitive advantage that EDPR has, an exceptional know-how and a selective approach regarding the potential investments, and the continuously improving of the operation metrics, applying programs that maximize production and focus on efficiency and cost control. Combining these two aspects, EDPR

presents a higher availability, load factor and decreasing operating costs, delivering increase profitability.

Beyond financial results and performances, EDPR has an active role regarding the sustainability of its operating practices and corporate social responsibility. This fact is materialized with the first position in FTSE4Good Utilities Index, a market index that aggregate utilities' companies that matches high levels of these two important features in actual financial world.

The performance of EDPR is driven essentially by the national energy regulation, debt profile and investment plan. Over the last four years, EDPR has presented higher and stronger EBITDA margins even ultimately they have registered a decreasing path.

Figure 9: Revenues, Operating Costs and EBITDA Margins

Yearly data (€Million) over period 2010 - 2013

	2010	2011	2012	2013
Revenues	947,65	1068,83	1285,15	1355,80
Operating Costs	234,87	268,13	347,61	408,80
EBITDA	712,78	800,70	937,53	947,00
EBITDA/Revenues	75,22%	74,91%	72,95%	69,85%

Source: EDPR Annual Report

EDPR has, as we already defined, a low risk diversified portfolio split among ten countries[18], which is organized in five different regions for the purpose of this work: Spain, Portugal, Rest of Europe (RoE), NA and Brazil. The larger contributions for the EDPR's 2014 expected portfolio composition are the NA and Spain business units, representing 43% and 27% respectively[19].

The national energy regulatory states the remuneration scheme of renewable energy that differs from one country to another and presents different specifications, which will be explored forward in an individual section. Obviously, it drives the total revenues through the real exercised selling price of electricity plus other specific sources of income.

[18] Excluding Mexico and UK
[19] See Appendix 3

Since the IPO, EDPR's revenues have been growing consistently each year, achieving more than €1 Billion since 2011. Taking into consideration the last EDPR annual report, the revenues achieved €1.356 Billion, based on a selling price of €62.40/MWh (-2% YoY) and a production level of 19.903 GWh (+8% YoY) justified by the previous highlighted quality of the assets of the company that achieve a higher load factor of 30% (+0.6pp vs 2012) and an availability of 97.6%.

The remuneration scheme is a crucial factor of this performance as we stated previously, being important to underlying that 93% of the total capacity in 2013 is exposed to long-term and pre-defined remuneration agreements, as PPA and FiT, being the remaining exposed to the US wholesale market, even partially hedged. This scenario allows reducing the uncertainty regarding the future remunerations, once the conditions negotiated are valid for 15 to 20 years, and the average maturity is at least 2020 of the first negotiations. The exposition to the volatility of energy prices is so avoided by these long-term contracts, which reduce the exposition of the entire company to the energy market and regulatory changes without retroactive effects, keeping the low risk strategy and the selective growth plan.

The average selling price of €62.40/MWh is strongly impacted by the lower realized price in Europe (-6% YoY), mainly because the regulatory changes in Spain, which imposes limitations on the prices, given the end of Transitory Regime and the implementation of the new regulatory framework, with retroactive effects. The average selling prices exercised in US and Brazil have increased 3% and 8% YoY respectively, essentially supported by the higher price in the PPA/Hedging output in US and by the inflation and working hours adjustment in Brazil.

The positive evolution of the electricity output reflects directly the optimization of the load factor performance, availability and capacity growth of the assets during the last four years[20], additionally the stable wind conditions that obviously have impact on final production of the wind power plants.

The operating costs have being also a remark of EDPR management, and one of the crucial factors for the past achieved EBITDA margins. The highest levels of excellence and the strong focus on cost of control are part of the planned distinctive efficiency that EDPR aims to

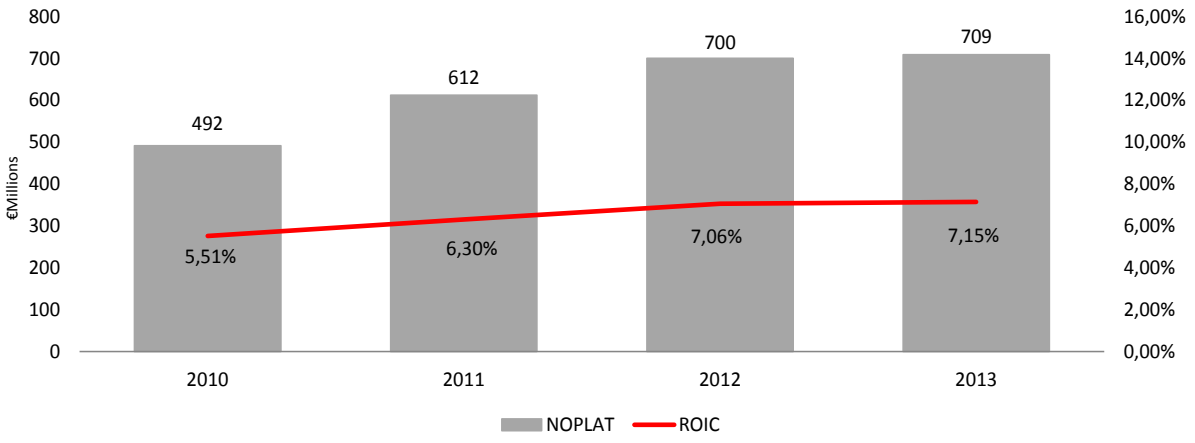
[20] See Appendix 4

achieve. EDPR's operating costs account 20% of levies, 32% of O&M, and 48% of SG&A+Personnel Costs, according to the Investor Day presentation[21]. The first one was penalized for the new levies introduction by Spanish market, being the other two segments pressured by a specific cost program, M3, delivering higher efficiency, high cost controlling and increases the economies of scale benefits. This trend will be the future costs path of EDPR, leading to improvement in efficiency and costs ratios.

Complementary to this scenario, a required strong and efficient investment plan is necessary to have capacity to operate a selective, sustainable and profitable growth plan. Talking about renewable energy sector, the capital expenditures (capex) appears as the best proxy to evaluate the capacity to growth, in terms of portfolio capacity. The large part of investment required is identified as capex for expansion, at the beginning of the power plants' and additions' constructions, followed by a maintenance capex that historically is marginal when compared to the total capital expenditures of one usual year, around 5% of total capex, a highlighted number by the executive director of EDP. The gross capex is made essentially until 2010, representing now the necessary capital to achieve the programmed additions to the portfolio based on an average target €/MW addition.

Considering the last four years of activity, EDPR has presented positive values relatively to NOPLAT and ROIC, reflecting directly the previous information that is translated in strong results for all stakeholders.

Figure 10: NOPLAT and ROIC evolution over the period 2010-2013



Source: EDPR Annual Report

[21] See Appendix 5

In September 2014 was presented the Investment and Strategic Plan through 2017 based on three main pillars: selective growth, operational excellence and the self-funded business. This plan was designed to create distinctive value for all stakeholders, based on an expansion of the portfolio, keeping the top quality and the respective profitability, increasing efficiency, availability and focusing on a new energy renewable – the offshore wind energy.

Regarding the future of the company and its inputs for performance analysis, we have analyzed the annual and semester results, quarterly presentations, investment roadshows and Q&A sessions, in order to build strong and coherent assumptions that were afterwards discussed personally with the executive director of EDP, and will be explained in detail moreover.

2.4.3. Asset rotation strategy

As it is reinforced in the last investment plan, one of the most important pillars of EDPR's future strategy is to achieve a self-funding business model. In 2012, EDPR implemented a financial policy in order to achieve two milestones: first, given the EDPR capital intensive business, it was and still is necessary to be more independent from external sources of funding to be capable to respond to the several growth opportunities of the market; and second, through an innovative way, to accelerate value creation in projects that already are in final stages of development, getting higher IRR executing additional market opportunities instead of simple executing a selling operation of the assets.

The asset rotation strategy consists in selling minority stakes of different operational available assets, using the captured value to reinvest in new projects that will increase the total value and installed capacity of the portfolio. Summarizing, the sources of available funds are operating cash-flow of the previous year plus the result of the asset rotation strategy, which will be applied between investment, dividends and interests[22].

Since 2012, EDPR has concluded five transactions at attractive implied EV/MW multiples[23], aggregating around €878 Million of minority sales to CTG, Fiera Axium and Axpo Power. More, it was signed a Memorandum of Understanding (MoU) in December of 2013 with CTG

[22] See Appendix 6
[23] See Appendix 7

to sell the 60% stake that EDPR has in ENEOP consortium, around 543MW when fully capacity is installed.

The asset rotation strategy allows EDPR to convert risky projects into low risk ones, creating value immediately in the first stages of the projects operation, leveraging of assets with long useful life and stable cash flows. Specifically, EDPR monetizes the future value of cash flows from the different projects, maintaining the operating control of the wind farms and getting capacity to face more market opportunities and respective diversification and returns.

It is expected that in the future this type of operations continue given the importance of it in EDPR's future strategy and the success of the previous operations, reason why is a factor considered in our valuation model.

2.4.4. EDPR - National markets & regulatory framework

The medium-term view of EDPR about sector fundamentals is crucial to understand the design of development strategy elaborated by the company to face the challenging future.

For Europe in general, the market is facing short term pressures regarding the excess level of installed capacity, the perception that renewable sources are costly and the negative path of wholesale prices. Despite these challenges, the medium term positive perspectives support the future, essentially focused on decarburization's consensus, competitiveness of the wind energy and the market shifts structure to long term contracts.

For North America and other markets, the ongoing demand for wind will drive the sustainability of the business. North American region is taking advantage of coal retirement plan of 42GW simultaneously with a strong consistent wind demand through 2020, given the increasing wind competitiveness compared with other energy sources.

Finally, for other potential markets, Brazil and Mexico from EDPR's perspective, the attractive points are characterized by strong electricity demand and good wind conditions, supported by long-term contracts awarded based on competitive systems, as 20 years PPAs and auctions.

Afterward, we will present each operating platform, highlighting the actual situation of the markets, the remuneration schemes and the future trends.

2.4.5. Spain

According to the WWEA, Spain has 22.970MW installed capacity[24] by June 2014, remaining the 4th country in the world with higher wind power installed capacity, representing 6.83% of world total capacity installed.

The Spanish renewable market has facing a mature phase, given the closer achievement of the required target of energy from renewable sources and the regulatory changes made recently for the Spanish Government, facts already reflected in added capacity in the first semester of this year, only 0.1MW according to WWEA report.

The Spanish Government was forced to made changes in regulation once entire renewable energy sector had a structural error – the regulation scheme. The government subsidized the producers with high feed-in-tariffs, however without capacity to recover this cost. Simultaneously, the supply costs were increasing and the costs supported by consumers remained extremely lower, meaning the real cost was not being paid while it was being created a critical issue on the Spanish electricity market: the tariff deficit.

The tariff deficits "(...) are shortfalls of revenues in the electricity system, which arise when the tariffs for the regulated components of the retail electricity price are set below the corresponding costs borne by the energy companies"[25]. So, the tariff deficit is not less than the consequence of a political decision of not increasing the regulated tariffs up to a level that covers the costs originated by electrical utilities.

As it was discussed with an executive director of EDP, the regulatory changes made by Spanish government were the necessary measures to solve Spanish situation, however the followed strategy was much more aggressive than it was expected, solving the €35 Billion tariff deficit only in one year and half, based on retroactive effects and securitization operation.

This decision and the respective consequences of this regulatory shift influence the EDPR's future strategy in Spanish market. Nowadays, Spain accounts 27% of EDPR's portfolio with 2.368 MW installed in the end of 2014, being 174MW equity consolidated. According to

[24] See Appendix 8
[25] Network Industries Quarterly, vol. 13, nº1, 2011

EDPR's perspective, total value of installed capacity only will increase based on MW under construction, once its future strategy denies the possibility of future expansion or acquisitions, as it was transmitted by the executive director of EDP.

The main reason of this stagnation phase in Spanish market is the new legislation RDL 413/2014, which states the new remuneration scheme for wind energy and the new subsidies/taxes structure, being explained in detail in Appendix 10.

Summarizing, the wind energy will be sold on the market, rewarded with two remuneration components: (i) The first one is the pool price accounting caps and floors to compensate possible deviations from the base case pool price €48.2/MWh and (ii) complement per MW installed capacity, if it is necessary to achieve the defined standard return on 10yr Spanish bond yield plus 300bps. Regarding the new subsidies/taxes structure, the main alteration was the inclusion of a General Tax over electricity revenues of 7%, which is taking into consideration in valuation section.

2.4.6. Portugal

In June 2014, Portugal occupied the 11th position of the wind power installed capacity in the world, accounting 4.829MW installed capacity that represents 1.43% of world portfolio. In the first semester of 2014 was added 105MW, being expected that can increase the additions up to 400MW, once the Vestinveste consortium that received licenses to install 400MW in 2010 only installed 12MW until now. However, it is expected that after this set of capacity's installations, the market will not expand much more, achieving a mature degree, given the own country capacity and conditions to do so.

EDPR's position in the Portuguese market is significantly important accounting 13% of total expected portfolio in 2014, based on 700MW EBITDA capacity and 543MW consolidated capacity prevenient of a 60% stake in ENEOP consortium.

The remuneration is established during 15 years as FiT indexed to inflation and negatively correlated with the capacity factor, being the FiT remuneration extended to more 7 years, in the range €74/MWh – €98/MWh. The tariff for the ENEOP consortium was defined from a competitive negotiation, limited up to 33GWh production per MW installed, over 15 years.

After this period, the tariff will be based on pool price plus green certificate regime, if applicable.

On December 2012, China Three Gorges Corporation (CTGC) acquired 49% of equity shareholder position in wind Portuguese farms, nearby 700MW, plus 25% of outstanding shareholders loans, concluding the transaction by €359 Million, an implied €1.6 EV/MW, considered an optimum value. Recently, on December 2013, it was signed a Memorandum of Understanding to sell the EDPR's minority stake in ENEOP consortium, around 543MW, in line with the asset rotation strategy.

The tariff deficit problem is also a current issue in Portuguese market, reason why it was a critical issue during the Troika assistance program, once it defined that the support from the government must reduce, but simultaneously taking into consideration the past developments already achieved in renewable sector. Against what happened in Spain, the plan choose to reduce the tariff deficit was not pressuring the already installed capacity through retroactive effects, but focusing on the future renewables licensees, meaning the government had been in mind the importance of renewable sector for Portugal, even the continuously support by subsidies are now at lower levels comparing the past situation.

2.4.7. Rest of Europe

The presence of EDPR in Europe is extended further Spain and Portugal. The portfolio is operating in several European countries, as France, Italy, Poland, Romania, Belgium and UK, the last only under the pipeline wind offshore perspective.

According to WWEA report, France, Italy and Poland are part of Top 15 of higher world wind power installed capacity, registering reasonable values of added installed capacity, meaning a continuously development of the wind business.

The Rest of Europe group accounts 16% of EDPR's portfolio, which equals 1370MW of capacity installed. This value is leading by Romania, Poland and France, with respectively 521MW, 374MW and 334MW of capacity.

Accordingly to EDPR, the European Markets are expected to increase the portfolio by 0.4GW of installed capacity, executing projects with already awarded contracts, limiting the exposition to the wholesale market prices. Both Romania and Poland are considered the

European "emerging" markets with higher wind potential, registering extremely high growth rates of installed capacity over the last 3 years.

The future strategy is based on participation in new energy auctions for additions in Italy for projects with PPA, on continuous investment in France once it is a low risk market based on FiT and on competitive pipeline projects in Poland constrained by the new energy law, which is pressing the action plans of EDPR in the Polish market.

2.4.8. North America: US, Canada and Mexico

For EDPR's perspective and analysis, the operation in US and Canada are combined in the same business unit, North America, adding also the Mexican operation that will start in 2016. US is the 2nd country with higher level of installed capacity in the world, accounting 18.42% of total world wind power capacity, nearby 62GW, according to WWEA report.

The portfolio of EDPR is strongly exposed to the US market, representing 43% of total capacity with 3.685MW installed in the end of 2014. As we already mentioned, the coal retirement plan and strong renewable demand are driving the focus on this market. The Investment Plan presented by EDPR is displaying this path, representing the US market the core investment of future additions, with 1.130MW already secured, becoming EDPR the 1st company in new wind PPA in the US market.

In the US market, the wind energy demand has been driven by two different inputs: (i) The Renewable Portfolio Standard (RPS); (ii) Demand for new energy.

The first one consisting on demand for new renewable projects once the necessary achievement of defined renewable quotas by US states for consumption and production. The second one is based on costs competition between wind&solar and the CCGT in windiest regions[26], supporting the idea that new long term supply contracts are necessary for utilities.

Parallel to this structure, there are fiscal incentives that are extremely important to guarantee the wind business development and sustainability in US, as the PTC and ITC tax incentives and the MACRs, already mentioned previously.

[26] See Appendix 12

During 2013 was discussed the extension or not, which was pressing the wind business. The extension of the taxes incentives PTC and ITC after 2013 was accepted and was crucial to solve the pressure situation that wind business was facing, keeping clear the focus on diversify the US electricity portfolio.

The US market is also characterized by a concept extremely important for EDPR, the Tax Equity Investors. This concept appears once EDPR has not been able to fully enjoy the tax benefits, reason why to find a third party who can benefit those is essential. This third entity, the Tax Equity Investors, pays upfront the net present value of future tax benefits from the project, collecting also a minority stake of the operational cash flows to achieve a pre-defined internal rate of return[27].

Regarding the selling agreements that EDPR are exposed, there are three types of selling prices contracts: PPA, Merchant and Hedged.

The PPA provides a fixed tariff during at maximum 20 years, including the majority a defined price for RECs, an extra remuneration way through green certification of production. The merchant provides a tariff 100% exposed to the wholesale market, being the REC negotiated in a parallel market. Finally, the hedge contracts are an extension of merchant, fixing the floating price traded in wholesale market. The company swaps the floating price from the market by a contracted fixed price with a broker entity, banks or energy traders.

Taking into consideration the actual capacity installed of EDPR, 82% is exposed to PPA/Hedged regime, being 70% of total capacity under Tax Equity Investors.

Regarding the Canadian market, the EDPR installed capacity there only accounts 30MW, corresponding a solar PV project that have started the operation in 2014. The remuneration scheme is FiT during the next 20 years, achieving 136£/MWh in the end of the June.

The Mexican market is recently considered an expansion option for EDPR strategy, given the Constitutional Amendment that has started, in December 2013, the energy reform discussion for the electricity sector. This reform will have a significant impact on the future of wind industry in Mexico, providing a new legislation with the clearly goal of achieving the 2024 Mexican target of electricity from renewable energy of 35%.

[27] See Appendix 14

EDPR already secured 180MW to be installed in Mexico, keeping the attention on this market, given the reasons already explained previously about new markets.

2.4.9. Brazil

According to the WWEA ranking, Brazil occupies the 13th position with 4.700MW of installed capacity, more 1.301MW in the first semester of 2014. Brazil is considered the biggest Latin America market, registering an impressive 38.2% growth rate during the first six months in 2014, which becomes Brazil the third largest country in capacity additions, immediately after China and Germany.

Analyzing the tremendous potential of wind development, EDPR focused part of its investment to this market, participating and negotiating more auctions for future capacity installations.

Actually, EDPR has 84MW installed capacity and 236MW already awarded in 2011 that will be installed in the 2015-2017 period, representing 4% of portfolio in 2017.

The Brazilian market is characterized by a set of conditions considered as attractive by EDPR as long term PPA regime through competitive auctions for 20 years, given profitability and lower uncertainty, two key factors for EDPR long term strategy. The developing of the market was attributed to PROINFA, and recently managed by ANEEL.

According to an EDP executive director, Brazil will probably gain an important role in the EDPR portfolio, once it is part of EDPR strategy the increasing of installed capacity in Brazil. However, he stated, EDPR only will negotiate projects with the government support, meaning projects evaluated by BNDES. If the latter accepts the proposal, this means that is considered as a structural investment, and so the company has access to attractive financial conditions, an indirect subsidy of the government by interesting rates lower than inflation.

If the structure of the market does not alter, there are reunited the minimum conditions to expand the capacity and the investment in this market, under the strong investment plan already proposed by the company for the 2014-2017 period.

2.4.10. Offshore

Offshore market is one of growth basis for the post-2017 period for EDPR, reason why we have decided to include this market in our valuation exercise. The market will be represented by the partnerships projects already awarded with GDF Suez and under developing with Repsol, to potentially install more than 3.5GW, representing 16% of EDPR expected portfolio in 2024. Actually, offshore is still considered an expensive technology, based on demanding upfront investment and the higher daily operating costs. However, this technology offers higher availability factors, higher load factors, and consequently a higher total production[28]. The remuneration regime is generally FiT with or without the ROC system, achieving much more attractive values than Fit for onshore market, which results in largely positive value of total revenues.

2.5. Business risks and opportunities

In this last topic, we are summarizing the risks that EDPR might face, some related to the industry, whereas others are related with the countries where the company operates in. The main risks EDPR is subject to are natural conditions, regulation and legislation, exchange rates, and lastly, financing conditions.

EDPR total production of electricity is, as we explained before, directly related with the load/capacity factor, subsequently related with the wind conditions. EDPR strategy is focused on markets with strong wind availability, trying to mitigate this natural environment risk.

The fact of whole EDPR business is under a demanding regulated and legislated framework, it is itself a risk factor. Any possible changes in markets' regulations where EDPR has activity could have negative impacts on markets' results, as it was observed with the change of regulation by Spanish government, or the long US government discussion about the PTC extension incentive.

Regarding the exchange rates, it was already explained the EDPR's exposition to different currencies and the impact on some items given a depreciation or appreciation of them.

[28] Roland Berger, Offshore Wind Toward 2020,April 2013

Considering the debt profile of EDPR and the weight of external financing in the projects under development by EDPR, namely in US with Institutional Partnerships and project finance projects, if the financing market conditions are worsen, immediately EDPR will be penalized by higher requiring rates given the same projects' risk structure. This scenario can be worse if the asset rotation strategy's results are not good as expected in order to relieve the capital needs, increasing the issuing debt level.

The main opportunities of the industry and for EDPR are already accounted by EDPR in its future investment plan.

First of all, EDPR is focused on new onshore markets that offer high potential, as Mexico, Peru, Morocco and Turkey, having already secured capacity in Mexico and planning and analyzing the entrance in the other markets.

The first solar PV project in Canada opens a future expansion path over this technology, given the attractive cost and investment programs, the synergies between wind and solar projects and finally the simpler construction process and respectively faster starting operation phase, leading to a quickly investment recovery.

Finally, the offshore plan had started with the UK and France projects, which are included in our valuation model, considering by the general literature as the logical step for power generation companies, after development of wind onshore and solar PV industry, as it is the case of EDPR.

3. Valuation

3.1. Projections

In this last section, we will present and discuss the financial technical analysis made for EDPR based on what we addressed in the literature review section and in the company and industry overview. Also, we developed this part by combining the model's assumptions and company guidelines that we are capable to collect and establish over the last months.

Regarding the intention of EDP Group to reduce its Debt/EBITDA ratio over the next years, as the executive director explained, it is correctly assumed that the capital structure of EDPR will also change over the valuation period, justifying financial technique chosen to valuate EDPR beings a Sum of the Parts (SOP) valuation through an APV model.

On one hand, the SOP valuation combines a single valuation of each business unit where EDPR has or it will have operation activities, deriving the possibility to address different and specific assumptions closer to each reality as well as the possibility to analyze the foundation and origins of the company's value. On the other hand, the individual debt planning allows us to clearly understand the variable structure of the company as well as evaluate the value derived from EDPR's debt profile through the tax shield.

The EV for different business units is immediately calculated in euros, giving it is used the Forward-Rate Method for NA and Brazil business units, converting on a year-by-year basis the projected cash flows. These two are the only business units where income statement results is presented in a different currency, American Dollars (USD$) and Brazilian Reais (R$), being the others reported in euros.

Posteriorly, to obtain the equity value is necessary to adjust the EV for net debt, minorities, tax equity investors, debt and debt equivalents, cash and cash equivalents and present value of tax shield, thus allowing us to derive the target price per share.

The chosen technique requires a specific but coherent and transversal analysis among the six business units, deriving from the gross profit to EBIT. The methodology to achieve revenues, operating costs, depreciations and amortizations, and operational provisions are historically based, updated by the actual industry and macroeconomic inputs, as we explain above in detail. Moreover, for each business unit we have built a supportive engineer projection

regarding the characteristics of the wind farms, as installed capacity, load factor and respective production, which allow us to make stronger assumptions regarding the wind farms activities.

3.1.1. Portfolio Expansion Program

The portfolio capacity has direct impact on future projections, once MW installed capacity is an important driver for the main items, as revenues through the total production, or operating costs through the operating cost per MW dimension of the wind farm.

For this valuation, we considered that EDPR portfolio capacity includes all EBITDA and consolidated MW already installed and in operation, the under construction MW and the MW already signed but not in construction phase, signaled in Investor Day May 2014 presentation. Following, it is the considered additions plan for each market and the global view over the entire portfolio capacity.

Figure 11: MW capacity over the period 2014-2039

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025 - 2039
Spain	2 368	2 370	2 370	2 370	2 370	2 370	2 370	2 370	2 370	2 370	2 370	2 370
Additions	*58*	*2*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Portugal	1 108	1 151	1 243	1 243	1 243	1 243	1 243	1 243	1 243	1 243	1 243	1 243
Additions	*94*	*43*	*92*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
RoE	1 370	1 500	1 500	1 500	1 500	1 500	1 500	1 500	1 500	1 500	1 500	1 500
Additions	*250*	*130*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
US+Canada+Mexico	3 685	4 214	4 695	4 995	4 995	4 995	4 995	4 995	4 995	4 995	4 995	4 995
Additions	*18*	*529*	*301*	*301*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Brazil	84	163	241	320	320	320	320	320	320	320	320	320
Additions	*0*	*79*	*79*	*79*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Offshore	0	0	0	0	0	0	408	815	1 223	1 630	2 038	2 038
Additions	*0*	*0*	*0*	*0*	*0*	*0*	*408*	*408*	*408*	*408*	*408*	*0*
EDPR	**8 615**	**9 398**	**10 049**	**10 428**	**10 428**	**10 428**	**10 836**	**11 243**	**11 651**	**12 058**	**12 466**	**12 466**
Additions	*420*	*783*	*651*	*379*	*0*	*0*	*408*	*408*	*408*	*408*	*408*	*0*
Growth	*5%*	*9%*	*7%*	*4%*	*0%*	*0%*	*4%*	*4%*	*4%*	*3%*	*3%*	*0%*

3.1.2. Projected Revenues

The projected revenues are based in two main key drivers: total production of the wind farms and the sales' prices exercised among the business units. The total production of the wind farms is result driven by the MW of installed capacity, the load factor and output, creating a wind farm productivity ratio[29]. The sales' prices are according to the remuneration scheme already presented and some adjustments made for this specific model.

[29] Wind Farm Productivity Ratio = (Capacity MW Installed x Load Factor)/ Output

As we stated above, the installed capacity follows the additions plan of the portfolio for each market.

Load factors – To obtain the reference load factor for each market, we considered the average of the last available years, since the beginning of the operation, being constant over the valuation period.

Total production – The total production is in GWh basis, and given the historically production, we create the wind farm productivity ratio to be able to project the future output, assuming the constant load factor and additions plan defined installed capacity. In order to establish a constant ratio for the future, we decided between two options: (i) if the installed capacity was constant, we considered an average of the ratios of these years; (ii) If it is not constant, we selected the last value of the ratio for the future. This ratio allows us to estimate the wind farms total productions, an indispensable part to compute the revenues of each market.

Price – Taking into consideration what we have explained in the previous section regarding the remunerations, we analyzed the remuneration scheme and made specific assumptions to achieve the specific price for each different market and the evolution over the valuation period. We assumed that the prices are inflation adjusted every year, based on a reference value of inflation specifically for each market.

Figure 12: Remuneration Scheme and 2014 prices

Remuneration scheme and 2014 starting price		
Spain	Feed in Tariff	€ 75,19
Portugal	Feed in Tariff	€ 92,14
France	Feed in Tariff	€ 90,74
Belgium	Pool+Green Certificates	€ 112,67
Poland	Pool+Green Certificates	€ 95,70
Romania	Pool+Green Certificates	€ 122,67
Italy	PPA	€ 137,88
US	Pool+Green Certificates, PPA, Tax incentives	USD $48,16
Canada	Feed in Tariff	USD $134,40
Brazil	PPA	R$ 343,20
Offshore (UK, France)	Green certificiates (UK), Feed in Tariff (France)	€ 130,00

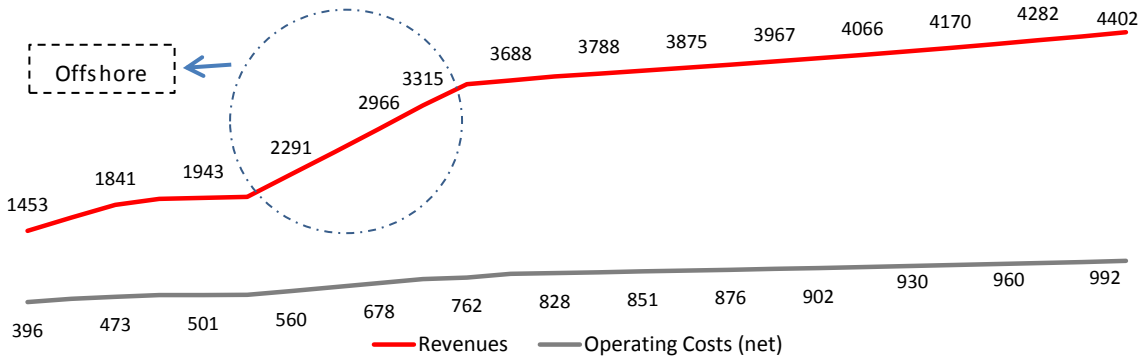
3.1.3. Projected Operating Costs

The operating costs are presented on EDPR annual report as connected to the wind farm dimension, which means an operating cost per MW, denominated as Opex/MWh. In order to obtain this reference value, we decide to compute the average of the last two years Opex/MW, and adjust in a year-by-year basis to the inflation and to the new installed capacity verified. Mexico and Offshore, the new markets considered in the model without historical data, we use reference values established by one offshore industry work, and for Mexico we use the same as used for US, once the Mexican market structure is highly correlated with the US characteristics.

In this topic is important to underlying the Spanish General Tax, a 7% tax over electricity sales generated in the market, which is accounted in our model and it has a significant role in Spanish results.

At this point, we are able to compute the EBITDA for each region and for global company. Nevertheless, in order to achieve the EBIT, we need to estimate and forecast the provisions, the depreciations and amortizations and government grants, the latter treated as amortization of deferred income.

Figure 13: Revenues and Operating Costs over the period 2014-2039 (€Million)



3.1.4. Provisions

Regarding provisions, we have considered the operational provisions and, in this exercise, the decommission provisions. The operational provisions we cannot estimate, and given the residual value presenting in different markets, we assumed that will be zero for the future. However, the decommissioning provisions need to be accounting, in one of the two

manners: (i) considered the change as a cost, therefore deducted before the EBIT; (ii) after the operating cash flow but always adjusted if part of provisions are used.

Our model is consistent with the first option, given we estimated the decommissioning provisions for the valuation period, seeing reasonable to treat them as a sunk cost that at a certain point in time will be used. To estimate and forecast them, we used the average of the last four years percentage of total MW capacity that the amount of provisions represents, keeping this percentage fix over the years, changing by the variable portfolio capacity.

3.1.5. Depreciation, Amortization and Government Grants

For the purpose of valuation, these set of variables are an extremely hard item to estimate and forecast. After some literature assessment and previous thesis based on the same industry and activity, we have decided that the value of depreciations and amortizations should be treated together and, independently, the government grants, being both based on a percentage of the total capacity of EDPR portfolio.

For each market, we have computed the percentage of MW capacity that is equivalent to the value of depreciations and amortizations, and government grants reported by EDPR, already dispersed by the different business units, and compute the average of the last 4 years, fixing this value for future estimations. This methodology allows us to understand in which proportion the wind farm is being depreciated, creating a coherent proxy to do it over the valuation period. Exceptionally, for offshore market, as we are able to define the initial amount of capex, we have decided to use a straight-line depreciation method over the purchase cost of the offshore wind farm during the 20 years of offshore assets' useful life.

3.1.6. Capex

Capital expenditures are a crucial term of the equity valuation exercise, given its impact on several items, as the free cash flow or net debt, among others. For EDPR case, capex is crucial for the expansion of the company through new projects, in the same or new markets.

For the model purpose, we have elaborated a capex plan based on information provided by the EDPR reports and presentations, including Q&A sessions, but also combining information

transmitted directly by the executive director of EDP, achieving a constant annual capex value of €650 Million.

Additionally, the floor capex estimated value changes positively given the estimation of offshore investment, based on two different projects. In the offshore market we have decided to use a reference value for capex per MW installed, being the capex value adjusted proportionally to the capacity under control by EDPR and not based on projected MW to be installed. The capex estimated value is assumed to be equal to the sum of the floor capex value of €650 Million plus the specific offshore capex value, as we can analyze from the graph above.

Figure 14: Capex Estimations

Value of capex (€Million) per year over the period 2014 - 2039	
2014	650,00
2015-2025	1 326,25
2025-2039	1 096,32

3.1.7. Investment in Net Working Capital

The last step before obtain the cash flow to be discounted is the change in net working capital. In order to calculate this term is necessary to achieve the total value of investment in net working capital, value that usually is completely different from the net working capital value defined internally by the companies, given the different assumptions assumed.

Considering the investment in net working capital as the generic difference between current assets and current liabilities, we have decided to compute accurately this value through the following structure.

- Current assets:
  - Trade receivables – computed based on an average of historic days of sales outstanding;
  - Inventories – computed as a percentage of total EDPR MW capacity, presenting a marginal value of the total assets;
  - Debtors and other assets from commercial activities – computed based on an average of historic days of sales outstanding;

- Current Tax Assets – computed as a fixed average percentage of company's revenues, once the value is directly associated to revenues taxation.

- Current liabilities:
  - Trade Payables – computed based on an average of historic days of costs, once it was related with company payments correlated with the day-by-day operation, as suppliers for example;
  - Current Tax Liabilities – here it is applicable the same rationale of Current Tax Assets, using a fixed historic average percentage of revenues;
  - Personnel costs and employee benefits – computed by summing the values of the different markets, once for each market's operating cost profile, we have calculated the average percentage of each category represents in total operating costs, being possible the split and individual calculation.

3.1.8. Tax Rate

After EBIT, and before the adjustments previously presented, depreciation and amortization, capex and change in net working capital, it is necessary to deduct the corresponding taxes to the value created by the company, based on tax regime in what is responding, in this case the Spanish one. For the valuation purposes, it is generally acceptable that the tax rate used is the effective tax rate instead of using the nominal one. The effective tax rate used is the average of the last 4 years tax effective EDPR rates, obtaining 25.11%, being the 2014 nominal tax rate equals to 30%.

3.1.9. Explicit Period and Terminal Value

Highlighting the fact that this company is singular regarding its activity and operation structure, we have decided that instead of using a usual 5 to 10 years of explicit period, we could develop a more accurate work if we used an explicit period equals to the useful life of the assets that company manages.

So for, the explicit period is equal to 25 years, the average useful life of wind farms considered in the literature and by the company as well[30]. It is true that in 2039, some projects already exceeded their useful life, but some are still in the useful life period, reason

[30] EDPR 2013 Annual Report.

why we consider at the end of the explicit period a terminal value, taking into consideration the savage value attributed by EDPR in its annual report for each business platform, based on a specific discount rate, inflation rate and capitalization of 25 years[31]. Nevertheless, it is important to mention that this terminal value concept does not reflect a perpetuity idea, but it tries to reflect the truly residual value of the wind farms in the end of their useful live.

3.1.10. Cost of Capital – Unlevered Cost of Equity

The cost of capital used to discount the cash flows of each business unit is the unlevered cost of capital.

The risk free used as it was stated in literature review section is the German Bund 30 years, given the explicit period considered, and the market risk premium is 6%, being part of the generally accepted range 5%-6% by the literature for diversified companies. The upside limit was chosen given the exposition to different markets, and consequently different market returns that were not estimated individually.

For unlevered beta, we have performed three distinct methods: the bottom-up strategy (peer group), the usual regression (EDPR returns vs EuroStock 600 returns) and Bloomberg data, deciding to follow the bottom-up strategy, and the respective beta calculated of 0.53.

Figure 15: Calculation of Beta

Monthly data over the period 2010 - 2014

Peer company	Country	Raw Beta	Tax Rate	Mkt Cap (B)	Debt (B)	D/E	Unlevered beta
EDP RENOVAVEIS SA	Spain	0,67	30%	4,65	3,69	79%	0,43
ABO WIND AG	Germany	0,51	30%	0,05	0,01	24%	0,44
FALCK RENEWABLES SPA	Italy	1,12	31%	0,27	0,88	326%	0,35
ALERION CLEANPOWER	Italy	0,86	31%	0,12	0,31	254%	0,31
EOLUS VIND AB-B SHS	Sweden	1,09	22%	0,07	0,03	45%	0,81
RENEWABLE ENERGY GENERATION	UK	0,82	24%	0,09	0,02	26%	0,69
NEXTERA ENERGY INC	US	0,59	35%	36,01	20,61	57%	0,43
IBERDROLA SA	Spain	1,10	30%	35,43	29,60	84%	0,70
ACCIONA SA	Spain	1,04	30%	3,23	7,92	245%	0,38
ENEL GREEN POWER SPA	Italy	1,19	31%	8,96	6,47	72%	0,80
CHINA LONGYUAN POWER GROUP-H	China	0,77	25%	6,74	7,04	104%	0,43
						Average	**0,53**
				Levered Beta EDPR			**0,83**
				Levered Beta EDPR (Bloomberg)			**0,67**
Closing date: 18/12/2014				**Levered Beta EDPR (Regression)**			**0,64**

[31] See Appendix 9

According to the literature section, we have added a country risk premium to Brazil and to NA business units, the latter in the proportion of Mexican MW capacity, once Mexico has not a zero country risk premium as US and Canada. For Spain, Portugal, RoE and Offshore business units, we have assumed no country risk premium given the diversification of financial resources of EDPR in the European geography and the support of EDP.

The cost calculation process is segmented above, achieving a value of 4.60% for Spain, Portugal, RoE and Offshore, 4.69% for NA, and 7.40% for Brazil.

Figure 16: Unlevered Cost of Equity

Monthly data over the period 2010 - 2014	
Beta Unlevered	0,53
Rf	1,40%
MRP	6,00%
Cost of Equity Unlevered (Ru)	4,60%
Brazil*	7,40%
NA**	4,69%

*Country risk premium of 2.80%
**Country risk premium of 0.09% adjusted to Mexico business unit

3.2. Financing Plan – Market Value of Debt and Interest Tax Shields

The second part of the APV discounted cash flow valuation model is the debt plan, an essential part given the ability to describe the capital structure of the company and the corresponding benefits from it, the tax shields, but also important, an exploration about bankruptcy costs if EDPR enters in default.

Considering the evolution of capital structure of EDPR, it is directly related to the net debt level, a variable result driven by the cash flow statement of the company. This latter allows us to understand the global cash flow generation of EDPR available for face its commitments, the debt service, repayments and interest payments, and dividends, assumed as 28% of net profit for EDPR's equity holders. Subsequently, the capacity of EDPR is posteriorly converted in one of two options: (i) change of net cash available; or (ii) issuing

new debt, assuming that all available cash is totally used to face the pre-defined commitments. In our model the initial net debt value is not only including the usual debt value, bank and shareholder loans, but also includes financial derivatives instruments, commercial paper, nonconvertible bonds, loans from non-controlling interests, success fees related to acquisitions of subsidiaries, although we have decided to not estimate and analyze separately each of these components, assuming a unique global value of debt responsibilities.

Parallel to these variations, there is a repayments capital plan presented in EDPR 2014 annual report that is replicated integrally until 2017, being after assumed a repayment value also discussed and approved in conversations with the executive director of EDP as a good proxy of possible future repayments.

Regarding the costs of financing, we have assumed that for existing debt the cost of debt is the average cost of debt reported by EDPR, nearby 5.3%, and for new debt we have assumed the last yield to maturity of a issuing debt of EDP BV Finance, an independent vehicle responsible for issuing capital in order to satisfy financial needs of the EDP, nearby 2.68%.

The PVITS that EDPR benefits is so calculated based on global interest payments times the tax rate, which is the EDPR effective tax rate 25.11%, being after discounted by the actual yield to maturity 2.68%, once it is the actual market conditions for EDPR regarding financing activity, as it also happens to the net debt flows, also discounted at a rate of 2.68%.

Given this, the net present value of debt is equal to the sum of discounted values of repayments plus interest payments, and the PVITS is equal to the sum of discounted values of yearly tax shield, being respectively, deducted and summed to the EV.

Concluding, we have obtained a market value of debt equals to €5.444 Billion, which originates €895.76 Million of tax shield, as it is reported in Appendix 15.

Figure 17: EDPR's debt plan (€Million) over the period 2014-2039

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Net Debt - old	3.859,17	3.762,08	3.809,23	4.096,29	4.316,12	4.643,51	4.979,57	5.113,19	5.042,62	4.958,40	4.874,18	4.789,96	4.705,73
New debt	0,00	159,88	615,05	304,06	411,62	420,28	217,84	13,65	0,00	0,00	0,00	0,00	0,00
Total Debt	3.859,17	3.921,96	4.424,28	4.400,34	4.727,74	5.063,79	5.197,42	5.126,85	5.042,62	4.958,40	4.874,18	4.789,96	4.705,73
Repayments	97,09	112,73	327,99	84,22	84,22	84,22	84,22	84,22	84,22	84,22	84,22	84,22	84,22
Interest - old debt	204,54	204,54	193,42	176,03	171,57	167,10	162,64	158,18	153,71	149,25	144,79	140,32	135,86
Interest - new debt	0,00	0,00	4,28	20,76	28,91	39,93	51,19	57,03	57,39	57,39	57,39	57,39	57,39
Tax Shield	51,36	51,36	49,64	49,41	50,34	51,99	53,69	54,04	53,01	51,89	50,77	49,65	48,53
Discount factor	1,00	0,97	0,95	0,92	0,90	0,88	0,85	0,83	0,81	0,79	0,77	0,75	0,73
	301,62	308,99	498,61	259,59	256,13	255,20	254,34	248,84	239,03	229,28	219,87	210,79	202,04
NPV Debt	5.443,86												
	51,36	50,02	47,09	45,65	45,29	45,55	45,82	44,91	42,90	40,90	38,97	37,12	35,33
NPV ITS	895,76												

	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Net Debt - old	4.621,51	4.537,29	4.453,06	4.368,84	4.284,62	4.200,39	4.116,17	4.031,95	3.947,73	3.863,50	3.779,28	3.695,06	3.610,83
New debt	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Total Debt	4.621,51	4.537,29	4.453,06	4.368,84	4.284,62	4.200,39	4.116,17	4.031,95	3.947,73	3.863,50	3.779,28	3.695,06	3.610,83
Repayments	84,22	84,22	84,22	84,22	84,22	84,22	84,22	84,22	84,22	84,22	84,22	84,22	84,22
Interest - old debt	131,39	126,93	122,47	118,00	113,54	109,08	104,61	100,15	95,68	91,22	86,76	82,29	77,83
Interest - new debt	57,39	57,39	57,39	57,39	57,39	57,39	57,39	57,39	57,39	57,39	57,39	57,39	57,39
Tax Shield	47,40	46,28	45,16	44,04	42,92	41,80	40,68	39,56	38,44	37,32	36,20	35,08	33,95
Discount factor	0,71	0,69	0,67	0,66	0,64	0,62	0,61	0,59	0,57	0,56	0,54	0,53	0,52
	193,61	185,47	177,63	170,07	162,79	155,77	149,00	142,48	136,20	130,15	124,33	118,72	113,31
NPV Debt													
	33,62	31,97	30,38	28,85	27,38	25,97	24,62	23,31	22,06	20,86	19,71	18,60	17,53
NPV ITS													

3.3. Results of the valuation exercise

As we have presented in this previously section, the valuation process is characterized by different key drivers based on a set of assumptions that are the main subject of valuations exercises. We have exposed the main items and assumptions, in order to explain our rationale behind each part of the valuation, allowing a coherent and complete analysis of EDPR.

At this moment we present the valuation results, elaborating further a comparison exercise with the equity research note of Millennium Investment Banking.

3.3.1. EDPR APV valuation

According to our model[32], the business unit with higher contribution for total EV is the NA with 31%, proving the focus on this business unit assumed in the Investment Plan 2014-2017 by EDPR, followed by RoE and Spain, completing the major three contributions of EDPR portfolio. As we can verify, the SoP methodology obtains a total unlevered EDPR value of €12.509 Billion.

Figure 18: EV breakdown (€Million)

	EV	EV/MW	TV	% of EV
Spain	2 876	1,21	36,57	23%
Portugal	896	0,72	19,18	7%
RoE	2 961	1,97	23,14	24%
NA	3 866	0,77	48,52	31%
Offshore	1 225	0,60	31,44	10%
Brazil	684	2,14	1,64	5%
EDPR	12 509	1,00	160,49	100%

At this time, we are able to estimate the bankruptcy costs, which is a crucial term of the APV model. After the discussion on literature review section, we have applied 28% of the pre-distressed company value, adjusting it to the probability of default associated to the Energy and Environment[33] sector nearly 2.30%. Consequently, we have obtained €87.92 Million of bankruptcy costs.

To elaborate our recommendation it is necessary to achieve the corresponding equity value adjusting it for several variables, as net debt or cash and cash equivalents. These adjustments are more complex in the EDPR case, given the specific business structure and the company commitments, respecting the application of the valuation fundamentals.

So, the path between EV and Equity Value is characterized by:

[32] See Appendix 15 - the individually DCF of the SoP
[33] Moody's Investors Service, "Corporate Default and Recovery Rates, 1920-2010", February 2011

- Deductions:
    - Market value of debt – Debt plan;
    - Debt equivalents – Book value amount of decommissioning provisions reported in the 2014 3rd quarter balance sheet;
    - Tax Equity Investors – Book value of Institutional Partnership in US wind farms liability reported in the 2014 3rd quarter balance sheet;
    - Non-controlling interests – Equity value reported in the 2014 3rd quarter balance sheet;
    - Bankruptcy costs.
- Additions:
    - Cash and cash equivalents – Book value amount reported in the 2014 3rd quarter balance sheet plus the amount of investment in associates;
    - Present value of interest tax shields – Debt plan.

Analyzing the previous deductions and additions, it is reported the following table that presents the different variables values, achieving the equity value of €6.197 Billion. Consequently, based on the ordinary number of shares, the target price per share equals €7.10, which represents an upside potential of 29% compared with the 18th December closing price. This dissertation is so responsible for providing a BUY recommendation for EDPR stock.

Figure 19: From EV to Equity Value (€Million)

Value of Unlevered Firm	12509
Cash and Cash Equivalents	330
Tax Beneficts	896
Market Value of Debt	5444
Bankrupcy Costs	81
Non Controlling Interests	437
Tax Equity Investors	1508
Debt Equivalents	69
Equity Value	6197
#shares	872
Target Price per share	7,10 €
Closing Price (18/12/2014)	5,52 €
Upside Potential	29%

3.3.2. Relative Valuation – Market Multiples Analysis

Additionally to the APV discounted cash flow model, as we have stated previously, we have also performed a relative valuation for EDPR. The chosen peer group intercepts the conditions already explained and we consider that it represents a coherent and strong peer group, inside of power generation segment.

Regarding the specific multiple presented, we have opted to exclusively use the EV/EBITDA trailing multiple, once it reflects the necessary information to compare to the other method used, fitting in our defined framework of EDPR valuation.

Analyzing the selected peer group, we try including high market capitalization companies, but also small ones, in order to capture the effects of the partnerships made by EDPR with smaller companies plus the effects of them on the overall risk of activity.

The relative valuation calculates an EV of €13.221 Billion, 5.69% higher value comparing with the APV achieved value.

Figure 20: Relative Valuation

Peer group of EDPR - EV/EBITDA analysis

Company	**EV/EBITDA 2015**
ABO WIND AG	25,40x
FALCK RENEWABLES SPA	7,41x
ALERION CLEANPOWER	8,99x
EOLUS VIND AB-B SHS	2,96x
RENEWABLE ENERGY GENERATION	23,06x
NEXTERA ENERGY INC	11,96x
IBERDROLA SA	6,73x
ACCIONA SA	6,48x
ENEL GREEN POWER SPA	9,22x
CHINA LONGYUAN POWER GROUP-H	8,90x
Mean	10,96x
Enterprise Value	13 220,85
RV vs APV Enterprise Value	(+) 5,69%

3.3.3. Comparison exercise – Millennium Investment Banking (MIB) Equity Research Note

The equity valuation exercise performed in this dissertation is a current activity of several investment banks through their equity research departments. The equity research notes published for investors are a good starting discussion point, reason why we have decided to elaborate a comparison exercise between them and our work.

We have selected an Equity Research Note of EDPR from MIB of 24th February 2014, looking to the main assumptions and make a comparison exercise among final results and conclusions.

We have focused our comparison essentially on the portfolio composition, valuation model considered and specific inputs assumptions.

From the portfolio composition analysis, the MIB assume a fixed value, already secured or not, of additions between 2014 and 2020 of 2.8GW, which does not include the Mexico and

Offshore markets. In our work the capacity assumption is only the available capacity already installed or with already defined agreements or partnerships, aggregating the two markets mentioned before but not considering the potential prospects as MIB does.

MIB performed its equity valuation based on a SoP valuation through a WACC method, a different approach of the model used in our work. More, there are some variables that we have identified that can explain the undervalued value.

a) The production projections are largely overestimating our projections;

b) The load factors are projected differently each year in the MIB analysis and not constant;

c) The capex is considered separately for each market and based on a value per MW, presenting a lower value given the exclusion of offshore;

d) The revenues are indirectly estimated by estimating gross profit margins;

e) The depreciations are calculated by changing the previous year value by an estimated percentage.

Considering the EV to equity value path, MIB considers as net debt and adjustments the net debt including US institutional partnerships, the minority interests, the 2013 dividends while our model includes more some items regarding specifications of the model, as tax benefits or bankruptcy costs, but also the decommission provisions as debt equivalent and cash equivalents, displaying a more detailed path between EV and equity value.

Concluding, the price target achieved by MIB is €5.60, a similar value comparing with our scenario (b), and obviously undervalued when it is compared with our base case, given the reasons already identified.

3.3.4. Sensitivity Analysis

For the credibility of this valuation exercise, we have decided to implement a sensitivity analysis based on four scenarios that reflect possible changes in key drivers of the valuation.

The scenarios are conducted in order to reflect possible changes in wind market conditions, operational wind farms characteristics, regulated definitions and financial planning, logically

under the *ceteris paribus* assumption. Parallel, we have created a generic scenario which is applied to the others simultaneously, by a sensitivity exercise over the unlevered cost of equity. This complement adds value to the overall valuation by a widespread inclusion of possible different scenarios.

The final analysis is displayed above, explaining each scenario purpose further.

Figure 21: Sensitivity Analyzis

Re Unlevered	4,14%	4,37%	4,60%	4,83%	5,06%
Base Case scenario	€ 8,12	€ 7,60	€ 7,10	€ 6,62	€ 6,16
Scenario 1	€ 7,33	€ 6,99	€ 6,67	€ 6,35	€ 6,05
Scenario 2	€ 6,56	€ 6,09	€ 5,64	€ 5,20	€ 4,78
Scenario 3	€ 8,90	€ 8,38	€ 7,89	€ 7,40	€ 6,94
Scenario 4	€ 6,41	€ 5,93	€ 5,48	€ 5,03	€ 4,60

Scenario 1 - Without offshore business unit
Scenario 2 - Flat prices + flat opex (2013 values)
Scenario 3 - New repayments schedule
Scenario 4 - Load factor @ 28% (except Mexico and Offshore)

Base case – The base case reflects the valuation model without any constraint, given the initial assumptions.

Scenario 1 – This scenario is focused on the offshore market, trying to test the impact of non-development of offshore projects, since in terms of future portfolio composition, this market accounts a significant part of it.

Scenario 2 – Regarding the possible uncertainty regulatory framework, this scenario measures the impact if we assume that prices and operating costs are flat in levels of 2013 for each market, as some investment banks present in their equity research notes.

Scenario 3 – When we are analyzing the debt plan of the base case valuation, we are assuming an average repayment every year, until the end of explicit period, reducing the net debt/EBITDA ratio above to 2.2x. This value appears in some presentations as a possible long term future target, and with this scenario we are evaluating this impact on our valuation.

Scenario 4 – As it was already stated, the estimations of revenues are correlated with some technical wind farms characteristics. This scenario unlocks the opportunity to face a negative impact on wind farms' load factors, fixing at a constant value of 28% instead of the 30% verified in the base case for all markets except Mexico and Offshore.

Unlevered cost of equity – Transversally to these scenarios, it was added an analysis based on sensitivity of the discount rate used, for each scenario, giving a target price interval for the valuation value.

Conclusion

The purpose of this dissertation lies on an equity valuation of EDPR, contributing for the equity research developments and adding value for renewable industry in general, exploring the main wind industry guidelines, and how the equity valuation fundamentals should be adjusted to them.

We have performed an exhaustive analysis of the industry characteristics that are important in terms of our valuation assumptions, as load factors, production levels or economic metrics, as operating cost per MW or price per MWh.

This valuation exercise is highly supported on the available information by EDPR reports and presentations, but also on additional conversations with the EDP executive director. The latter fact increased the quality and level of detail of information collected, which combined with a strong theoretically allowed us to elaborate a strong and well fundament valuation exercise.

We have decided to use the APV valuation model based on the specific company's characteristics and data collected, even it is rarely used by Investment Banks' equity research departments, given the specific information required and the complexity of the model.

The strategy we used allows the investors to better understand the current big picture of EDPR, therefore analyzing correctly the variable capital structure of the company - a key factor of the overall industry and company itself - plus identifying the different sources of value through a SOP method for business units' valuation complemented with an individual debt plan.

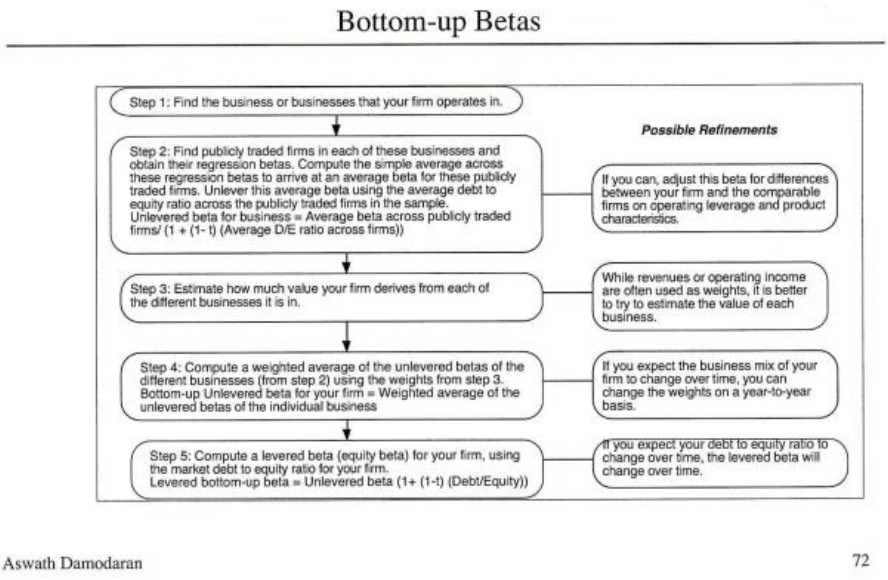
The set of information collected, the assumptions made, the fulfilment of accounting rules, the valuation method application, jointly are translated in the estimated target price of €7.10 per share and in our base case, a BUY recommendation. It is mandatory to underline that any scenario considered in sensitivity analysis present as central value lower than the last 18th December closing price.

To conclude, this dissertation raised an extremely important question regarding the future of EDPR that we previously discussed with the executive director, from whom we received a

positive feedback. It is natural that at certain point in the future, EDPR will be reallocated as a wind or renewable department of EDP for managing purposes, as it happens with Iberdrola, as if the company was a huge project finance that will be concluded.

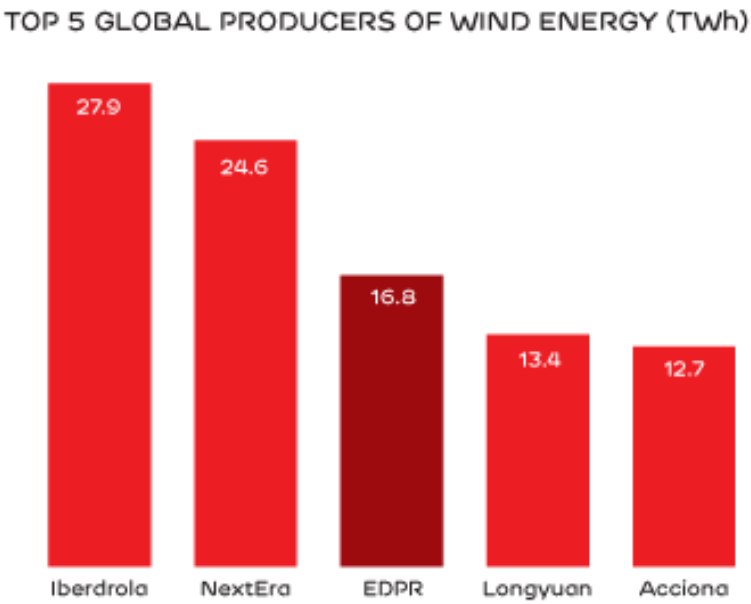
Appendix

Appendix 1 – Damodaran Bottom-up Strategy for Beta calculation



Source: Damodaran (1999)

Appendix 2 – Producers of wind energy



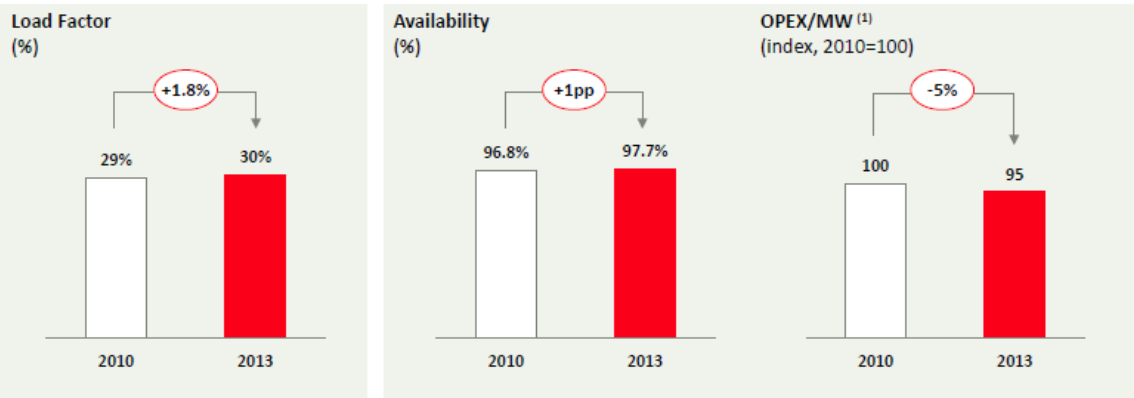
Source: EDPR Annual Report

Appendix 3 – Estimated MW capacity breakdown in the end of 2014

Spain	2368
Portugal	1108
France	334
Belgium	71
Romania	521
Italy	70
Poland	374
US	3655
Canada	30
Brazil	84
Mexico	*
Offshore	*
EDPR	8615

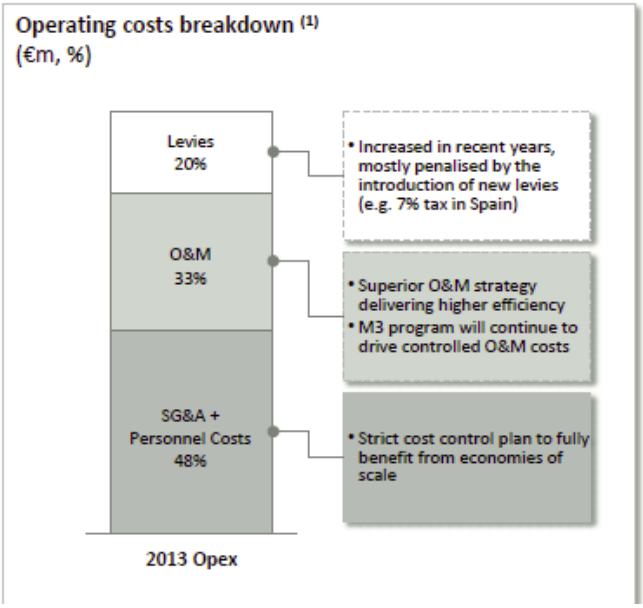
* no active capacity in 2014

Appendix 4 – EDPR operating factors



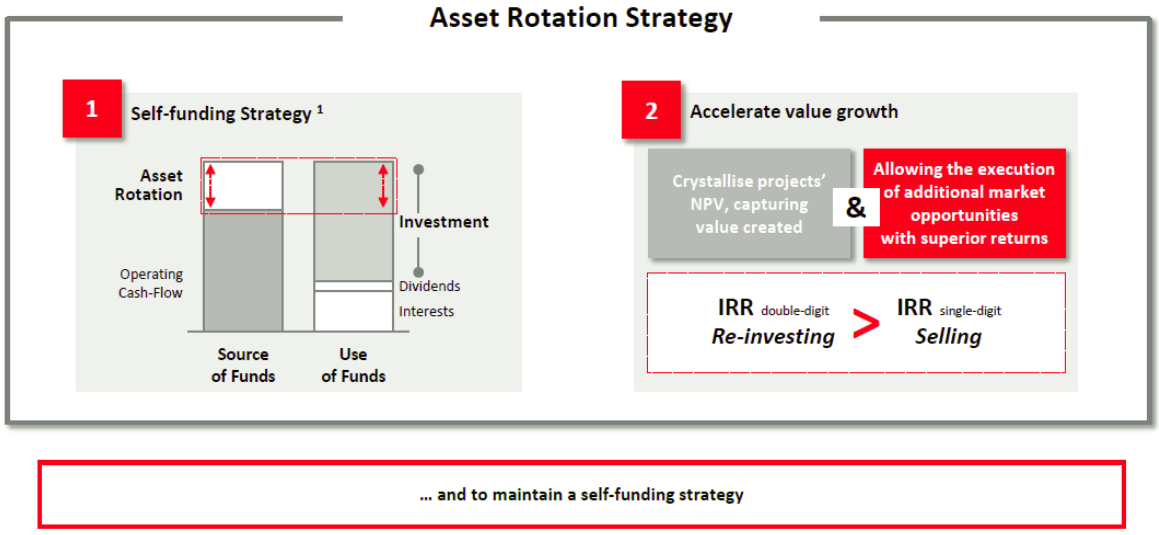
Source: EDPR Investor Day 2014

Appendix 5 – EDPR operating costs breakdown



Source: EDPR Investor Day 2014

Appendix 6 – Asset Rotation Strategy



Source: EDPR Investor Day 2014

Appendix 7 – Asset Rotation transactions

Source: EDPR Investor Day 2014

Appendix 8 – WWEA 2014 Half Report Ranking

	Country	Total Capacity 2014 [MW]	Added Capacity H1 2014 [MW]
1	China	98'588	7'175
2	USA	61'946	835
3	Germany	36'488	1'830
4	Spain	22'970	0,1
5	India*	21'262	1'112
6	United Kingdom	11'180	649
7	France	8'592	338
8	Italy	8'586	30
9	Canada	8'526	723
10	Denmark	4'855	83
11	Portugal	4'829	105
12	Sweden	4'824	354
13	Brazil	4'700	1'301
14	Australia	3'748	699
15	Poland	3'727	337
	Rest of the World	31'506	2'042
	Total	**336'327**	**17'613**

Source: WWEA Report

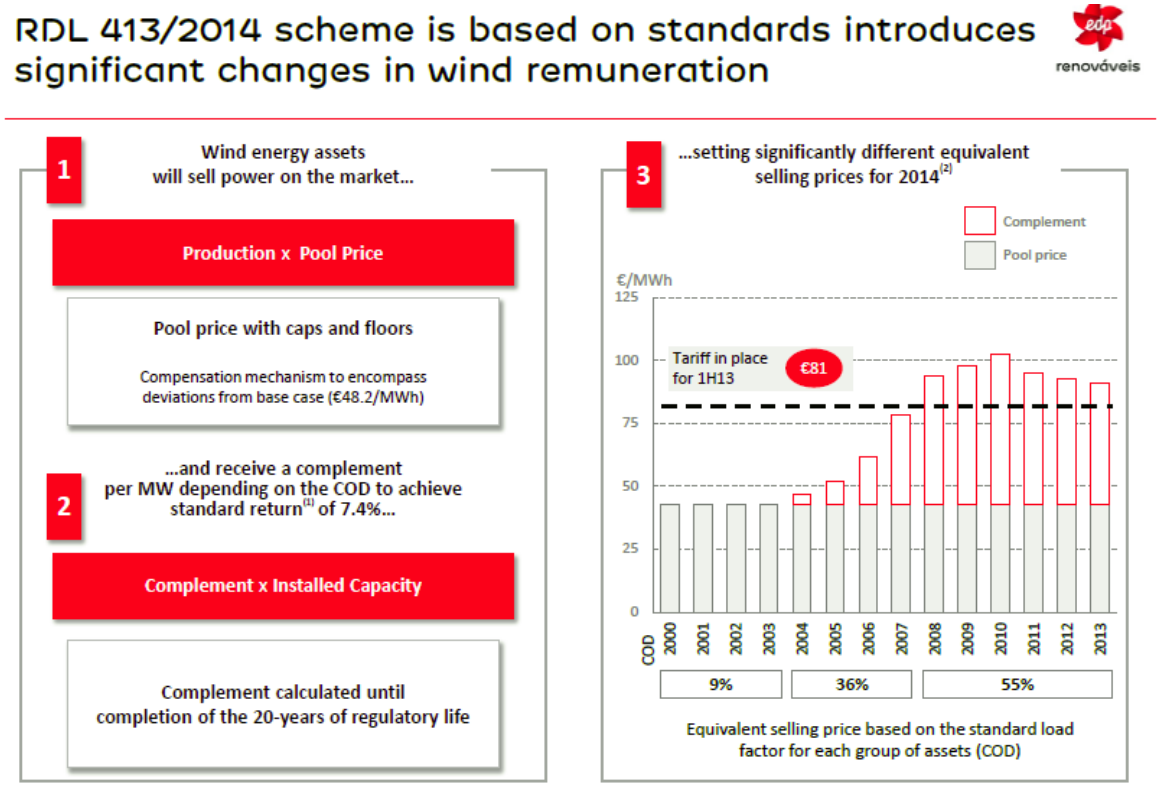
Appendix 9 – EDPR's terminal value assumptions

The assumptions used are:

	EDPR EU	EDPR NA
Average cost per MW (Euros)	14,000	18,549
Salvage value per MW (Euros)	25,000	17,776
Discount rate	6.33%	5.38%
Inflation rate	2.00%	2.50%
Capitalisation (number of years)	25	25

Source: EDPR Annual Report 2013

Appendix 10 – New Spanish Regulation RDL 423/2014



Source: EDPR Investor Day 2014

Analysing the total capacity installed by EDPR, 91% is under "with complement" regime, while 9% is under "without complement" regime. "With complement" regime considers standard production, exposed to a regulatory price of €48.2/MWh, and the above standard production, exposed to the pool price as well as the "without complement" regime. Analysing total volume production, EDPR considers that standard production accounts 80% and above standard production 20%, being 72% partially exposed to the regulatory price

between €40/MWh and €56/MWh adjusted to the capacity complement, and 28% hedged at €47/MWh as we can analyse from the graph disclosed by EDPR.

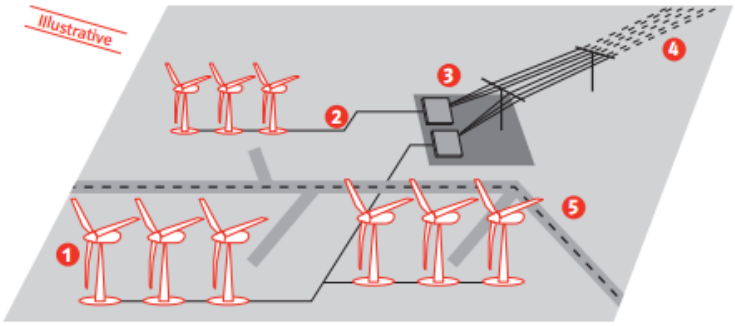
Appendix 11 – Wind Industry Capex Breakdown

Onshore wind farms and capital expenditure break-down

From wind turbine generator to the grid

Wind farm part	Capital expenses[1]
Wind turbines	70%
Inter-array cables	7%
Substations	4%
Export lines	2%
Site access	7%
Construction work and foundation	10%

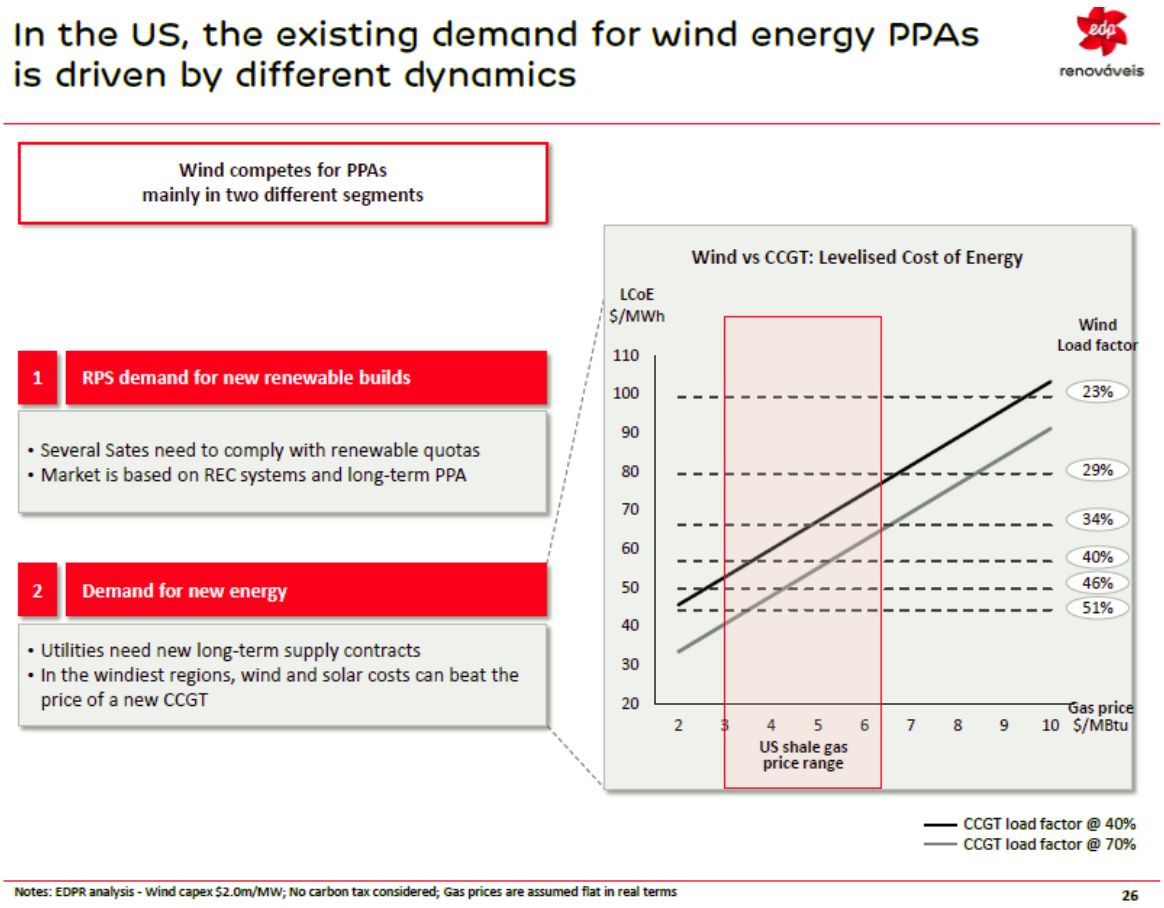
Total capital expenses for the construction of an onshore wind farm



1. **Wind turbine generators** Wind turbines transform wind energy into electricity. Turbines are usually clustered into rows in order to provide the optimum balance between availability and value for money
2. **Inter-array cables** Transport the electricity generated by the wind turbine to the substation or the grid (in absence of substation)
3. **Substations** Use transformers to increase the voltage to reduce transmission losses
4. **Export lines** Transport the electricity from the wind farm to the grid
5. **Site access** New roads and road reinforcements

Source: E.ON Wind Energy Factbook

Appendix 12 – US market characteristics



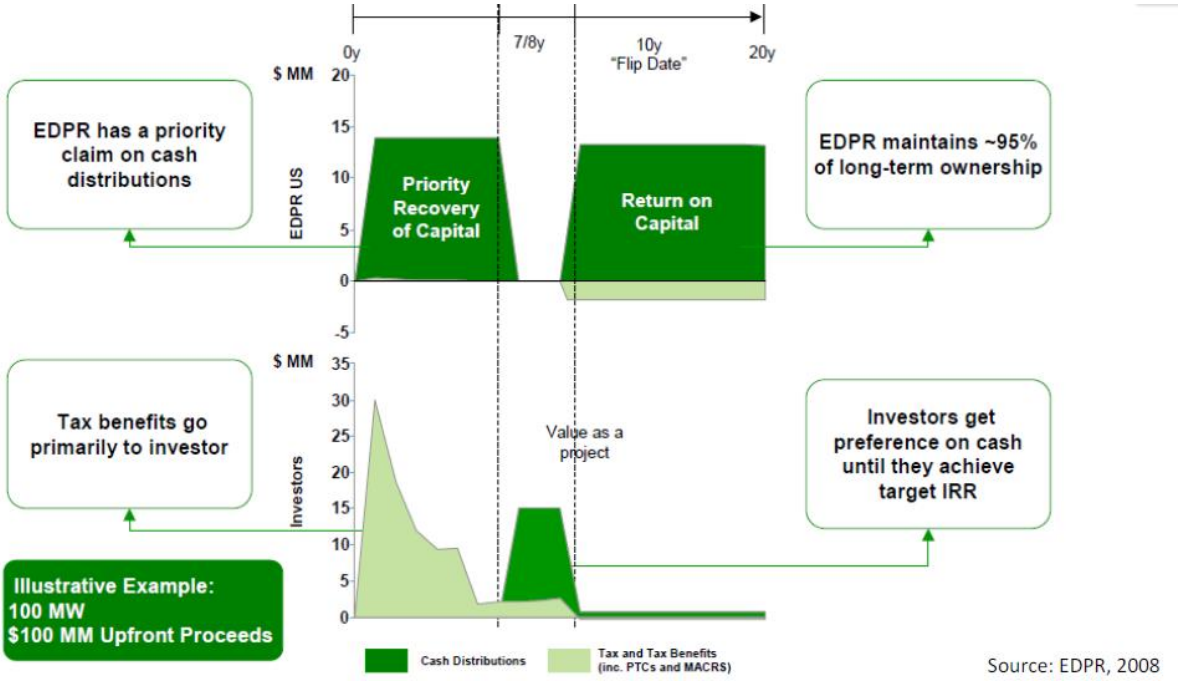
Source: EDPR Investor Day 2014

Appendix 13 – US incentives: further details

In 2013, the PTC incentive allows a reduction on wind energy cost by USD cents 2.3/kWh, which contributes to wind energy cost efficiency when compared with oil or coal. Additionally, the ITC, a tax incentive over cash grants, is a direct remuneration way over the total investment on wind farms. It allows amounting 30% of the investment made by the company, hedging for negative production conditions.

The MACRs also represents an incentive for energy producers giving the possibility to fiscally depreciate wind farms, almost 95% through the first 5 years of operations. This fact allows companies to recover the total investment faster than usual, through the depreciations deductions, as EDPR states in its annual report.

Appendix 14 – US Tax Equity Investors (Illustrative Scheme)



Source: EDPR, 2008

Appendix 15 – APV valuation for EDPR

Spain

Millions €	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
EBITDA	270,80	317,27	322,05	326,22	330,44	334,72	339,05	343,43	347,87	352,37	356,24	360,15	364,11
Provisions (Change)	0,30	-0,02	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Depreciation and Amortization	-165,07	-165,21	-165,21	-165,21	-165,21	-165,21	-165,21	-165,21	-165,21	-165,21	-165,21	-165,21	-165,21
Amortization of Deferred Income (governement grants)	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25
EBIT	**106,28**	**152,30**	**157,10**	**161,27**	**165,49**	**169,76**	**174,09**	**178,48**	**182,92**	**187,41**	**191,28**	**195,20**	**199,16**
Tax rate	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%
NOPLAT	79,60	114,06	117,65	120,77	123,94	127,14	130,38	133,66	136,99	140,35	143,25	146,18	149,15
Depreciation and Amortization	165,07	165,21	165,21	165,21	165,21	165,21	165,21	165,21	165,21	165,21	165,21	165,21	165,21
CAPEX	149,28	138,07	120,52	120,52	120,52	126,54	126,54	126,54	126,54	126,54	126,54	126,54	126,54
Changes in Net Working Capital	-35,86	-17,29	1,04	-6,89	0,76	-0,72	14,09	12,76	11,75	11,35	25,91	-19,96	-2,81
CF to be discounted	**131,24**	**158,49**	**161,30**	**172,36**	**167,87**	**166,52**	**154,95**	**159,56**	**163,90**	**167,66**	**156,00**	**204,81**	**190,62**
Discount Factor	1,00	0,96	0,91	0,87	0,84	0,80	0,76	0,73	0,70	0,67	0,64	0,61	0,58
Discounted Cash-flow	**131,24**	**151,52**	**147,43**	**150,62**	**140,25**	**133,01**	**118,33**	**116,50**	**114,40**	**111,88**	**99,53**	**124,92**	**111,16**

Re Unlevered	5%
PV of FCFF+TV	2.876

Spain

Millions €	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	TV
EBITDA	368,11	372,15	376,24	380,38	384,56	388,78	393,06	397,38	401,74	406,16	410,62	415,13	419,70	
Provisions (Change)	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	
Depreciation and Amortization	-165,21	-165,21	-165,21	-165,21	-165,21	-165,21	-165,21	-165,21	-165,21	-165,21	-165,21	-165,21	-165,21	
Amortization of Deferred Income (governement grants)	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	
EBIT	**203,16**	**207,20**	**211,29**	**215,42**	**219,60**	**223,83**	**228,10**	**232,42**	**236,79**	**241,20**	**245,67**	**250,18**	**254,74**	
Tax rate	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	
NOPLAT	152,14	155,17	158,24	161,33	164,46	167,63	170,83	174,06	177,33	180,64	183,98	187,36	190,78	
Depreciation and Amortization	165,21	165,21	165,21	165,21	165,21	165,21	165,21	165,21	165,21	165,21	165,21	165,21	165,21	
CAPEX	126,54	126,54	126,54	126,54	126,54	126,54	126,54	126,54	126,54	126,54	126,54	126,54	126,54	
Changes in Net Working Capital	-3,48	-3,58	-3,68	-3,79	-3,90	-4,02	-4,14	-4,27	-4,40	-4,54	-4,69	-4,84	-5,00	
CF to be discounted	**194,29**	**197,42**	**200,58**	**203,79**	**207,03**	**210,31**	**213,63**	**216,99**	**220,40**	**223,84**	**227,33**	**230,86**	**234,44**	**112,47**
Discount Factor	0,56	0,53	0,51	0,49	0,47	0,45	0,43	0,41	0,39	0,37	0,36	0,34	0,33	0,33
Discounted Cash-flow	**108,32**	**105,23**	**102,22**	**99,28**	**96,43**	**93,65**	**90,95**	**88,32**	**85,77**	**83,28**	**80,86**	**78,51**	**76,22**	**36,57**

RoE

Millions €	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
EBITDA	247,21	270,25	279,68	282,64	288,44	293,13	298,69	304,12	309,36	314,93	320,49	326,22	332,04
Provisions (Change)	-1,64	-1,04	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Depreciation and Amortization	-87,97	-96,32	-96,32	-96,32	-96,32	-96,32	-96,32	-96,32	-96,32	-96,32	-96,32	-96,32	-96,32
Amortization of Deferred Income (governement grants)	0,23	0,23	0,23	0,23	0,23	0,23	0,23	0,23	0,23	0,23	0,23	0,23	0,23
EBIT	**157,82**	**173,12**	**183,58**	**186,55**	**192,35**	**197,04**	**202,59**	**208,03**	**213,26**	**218,83**	**224,40**	**230,13**	**235,94**
Tax rate	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%
NOPLAT	118,19	129,65	137,49	139,71	144,05	147,57	151,72	155,79	159,71	163,89	168,05	172,34	176,70
Depreciation and Amortization	87,97	96,32	96,32	96,32	96,32	96,32	96,32	96,32	96,32	96,32	96,32	96,32	96,32
CAPEX	86,37	87,38	76,28	76,28	76,28	80,09	80,09	80,09	80,09	80,09	80,09	80,09	80,09
Changes in Net Working Capital	-27,94	-17,06	0,66	-4,36	0,48	-0,46	8,92	8,08	7,44	7,19	16,40	-12,63	-1,78
CF to be discounted	**147,74**	**155,65**	**156,87**	**164,12**	**163,62**	**164,25**	**159,04**	**163,95**	**168,51**	**172,93**	**167,88**	**201,21**	**194,71**
Discount Factor	1,00	0,96	0,91	0,87	0,84	0,80	0,76	0,73	0,70	0,67	0,64	0,61	0,58
Discounted Cash-flow	**147,74**	**148,81**	**143,39**	**143,42**	**136,70**	**131,20**	**121,45**	**119,69**	**117,62**	**115,40**	**107,11**	**122,73**	**113,54**

Re Unlevered	5%
PV of FCFF+TV	2.961

RoE

Millions €	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	TV
EBITDA	337,98	344,03	350,21	356,51	362,94	369,50	376,19	383,02	389,98	397,09	404,34	411,75	419,31	
Provisions (Change)	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	
Depreciation and Amortization	-96,32	-96,32	-96,32	-96,32	-96,32	-96,32	-96,32	-96,32	-96,32	-96,32	-96,32	-96,32	-96,32	
Amortization of Deferred Income (governement grants)	0,23	0,23	0,23	0,23	0,23	0,23	0,23	0,23	0,23	0,23	0,23	0,23	0,23	
EBIT	**241,89**	**247,94**	**254,12**	**260,42**	**266,85**	**273,41**	**280,10**	**286,92**	**293,89**	**301,00**	**308,25**	**315,66**	**323,22**	
Tax rate	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	
NOPLAT	181,15	185,68	190,31	195,03	199,84	204,75	209,77	214,88	220,09	225,42	230,85	236,40	242,06	
Depreciation and Amortization	96,32	96,32	96,32	96,32	96,32	96,32	96,32	96,32	96,32	96,32	96,32	96,32	96,32	
CAPEX	80,09	80,09	80,09	80,09	80,09	80,09	80,09	80,09	80,09	80,09	80,09	80,09	80,09	
Changes in Net Working Capital	-2,20	-2,27	-2,33	-2,40	-2,47	-2,54	-2,62	-2,70	-2,79	-2,87	-2,97	-3,06	-3,16	
CF to be discounted	**199,58**	**204,18**	**208,87**	**213,66**	**218,55**	**223,53**	**228,62**	**233,81**	**239,11**	**244,52**	**250,05**	**255,69**	**261,45**	**71,18**
Discount Factor	0,56	0,53	0,51	0,49	0,47	0,45	0,43	0,41	0,39	0,37	0,36	0,34	0,33	0,33
Discounted Cash-flow	**111,27**	**108,83**	**106,44**	**104,10**	**101,80**	**99,54**	**97,33**	**95,17**	**93,05**	**90,97**	**88,94**	**86,95**	**85,00**	**23,14**

Brazil

Millions €	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
EBITDA	17,86	33,00	46,62	65,76	69,92	74,35	79,05	84,05	89,36	95,01	100,90	107,16	113,81
Provisions (Change)	0,03	-0,63	-0,63	-0,63	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Depreciation and Amortization	-4,85	-8,41	-11,26	-14,93	-14,93	-14,93	-14,93	-14,93	-14,93	-14,93	-14,93	-14,93	-14,93
Amortization of Deferred Income (governement grants)	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
EBIT	**13,04**	**23,96**	**34,73**	**50,20**	**54,99**	**59,42**	**64,12**	**69,12**	**74,43**	**80,08**	**85,97**	**92,23**	**98,88**
Tax rate	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%
NOPLAT	9,76	17,94	26,01	37,60	41,18	44,50	48,02	51,76	55,74	59,97	64,39	69,07	74,05
Depreciation and Amortization	4,85	8,41	11,26	14,93	14,93	14,93	14,93	14,93	14,93	14,93	14,93	14,93	14,93
CAPEX	19,50	26,00	26,00	19,50	19,50	19,50	19,50	19,50	19,50	19,50	19,50	19,50	19,50
Changes in Net Working Capital	-1,20	-4,92	-4,20	-5,20	0,10	-0,10	1,90	1,72	1,59	1,53	3,50	-2,69	-0,38
CF to be discounted	**-3,68**	**5,27**	**15,47**	**38,23**	**36,51**	**40,02**	**41,54**	**45,47**	**49,58**	**53,87**	**56,32**	**67,20**	**69,86**
Discount Factor	1,00	0,93	0,87	0,81	0,75	0,70	0,65	0,61	0,57	0,53	0,49	0,46	0,42
Discounted Cash-flow	**-3,68**	**4,90**	**13,41**	**30,86**	**27,45**	**28,01**	**27,07**	**27,59**	**28,02**	**28,34**	**27,59**	**30,65**	**29,67**

Re Unlevered	7%
PV of FCFF+TV	684

Brazil

Millions €	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	TV
EBITDA	120,87	128,37	136,33	144,78	153,76	163,30	173,43	184,19	195,61	207,74	220,63	234,31	248,85	
Provisions (Change)	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	
Depreciation and Amortization	-14,93	-14,93	-14,93	-14,93	-14,93	-14,93	-14,93	-14,93	-14,93	-14,93	-14,93	-14,93	-14,93	
Amortization of Deferred Income (governement grants)	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	
EBIT	**105,94**	**113,43**	**121,40**	**129,85**	**138,83**	**148,37**	**158,50**	**169,26**	**180,68**	**192,81**	**205,70**	**219,38**	**233,92**	
Tax rate	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	
NOPLAT	79,34	84,95	90,91	97,25	103,97	111,11	118,70	126,76	135,31	144,40	154,05	164,30	175,18	
Depreciation and Amortization	14,93	14,93	14,93	14,93	14,93	14,93	14,93	14,93	14,93	14,93	14,93	14,93	14,93	
CAPEX	19,50	19,50	19,50	19,50	19,50	19,50	19,50	19,50	19,50	19,50	19,50	19,50	19,50	
Changes in Net Working Capital	-0,47	-0,48	-0,50	-0,51	-0,53	-0,54	-0,56	-0,58	-0,59	-0,61	-0,63	-0,65	-0,67	
CF to be discounted	**75,24**	**80,87**	**86,84**	**93,19**	**99,93**	**107,09**	**114,69**	**122,76**	**131,34**	**140,44**	**150,11**	**160,38**	**171,28**	**9,77**
Discount Factor	0,40	0,37	0,34	0,32	0,30	0,28	0,26	0,24	0,22	0,21	0,19	0,18	0,17	0,17
Discounted Cash-flow	**29,75**	**29,78**	**29,78**	**29,75**	**29,71**	**29,64**	**29,56**	**29,46**	**29,35**	**29,22**	**29,08**	**28,93**	**28,77**	**1,64**

Offshore

Millions €	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
EBITDA	0,00	0,00	0,00	0,00	0,00	0,00	242,07	489,89	743,57	1.003,20	1.268,89	1.285,25	1.301,83
Provisions (Change)	0,00	0,00	0,00	0,00	0,00	0,00	-3,27	-3,27	-3,27	-3,27	-3,27	0,00	0,00
Depreciation and Amortization	0,00	0,00	0,00	0,00	0,00	0,00	-202,87	-236,69	-270,50	-304,31	-338,12	-371,94	-394,25
Amortization of Deferred Income (governement grants)	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
EBIT	**0,00**	**0,00**	**0,00**	**0,00**	**0,00**	**0,00**	**35,92**	**249,93**	**469,80**	**695,61**	**927,49**	**913,32**	**907,58**
Tax rate	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%
NOPLAT	0,00	0,00	0,00	0,00	0,00	0,00	26,90	187,18	351,83	520,94	694,60	683,98	679,68
Depreciation and Amortization	0,00	0,00	0,00	0,00	0,00	0,00	202,87	236,69	270,50	304,31	338,12	371,94	394,25
CAPEX	0,00	676,25	676,25	676,25	676,25	676,25	676,25	676,25	676,25	676,25	676,25	676,25	446,32
Changes in Net Working Capital	0,00	0,00	0,00	0,00	0,00	0,00	-20,90	-16,51	-12,64	-8,88	7,55	-17,16	-2,42
CF to be discounted	**0,00**	**-676,25**	**-676,25**	**-676,25**	**-676,25**	**-676,25**	**-425,57**	**-235,87**	**-41,27**	**157,88**	**348,92**	**396,84**	**630,03**
Discount Factor	1,00	0,96	0,91	0,87	0,84	0,80	0,76	0,73	0,70	0,67	0,64	0,61	0,58
Discounted Cash-flow	**0,00**	**-646,53**	**-618,11**	**-590,95**	**-564,98**	**-540,15**	**-324,98**	**-172,21**	**-28,81**	**105,36**	**222,61**	**242,05**	**367,40**

Re Unlevered	5%
PV of FCFF+TV	1.225

Offshore

Millions €	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	TV
EBITDA	1.301,83	1.301,83	1.301,83	1.301,83	1.301,83	1.301,83	1.301,83	1.301,83	1.301,83	1.301,83	1.301,83	1.301,83	1.301,83	
Provisions (Change)	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	
Depreciation and Amortization	-416,57	-438,88	-461,20	-483,52	-505,83	-528,15	-550,46	-572,78	-595,10	-617,41	-639,73	-662,04	-684,36	
Amortization of Deferred Income (governement grants)	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	
EBIT	**885,26**	**862,94**	**840,63**	**818,31**	**796,00**	**773,68**	**751,36**	**729,05**	**706,73**	**684,42**	**662,10**	**639,78**	**617,47**	
Tax rate	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	
NOPLAT	662,97	646,26	629,55	612,83	596,12	579,41	562,70	545,98	529,27	512,56	495,85	479,13	462,42	
Depreciation and Amortization	416,57	438,88	461,20	483,52	505,83	528,15	550,46	572,78	595,10	617,41	639,73	662,04	684,36	
CAPEX	446,32	446,32	446,32	446,32	446,32	446,32	446,32	446,32	446,32	446,32	446,32	446,32	446,32	
Changes in Net Working Capital	-2,99	-3,08	-3,17	-3,26	-3,36	-3,46	-3,56	-3,67	-3,78	-3,90	-4,03	-4,16	-4,30	
CF to be discounted	**636,21**	**641,90**	**647,59**	**653,29**	**658,99**	**664,69**	**670,40**	**676,11**	**681,83**	**687,55**	**693,28**	**699,02**	**704,76**	**96,71**
Discount Factor	0,56	0,53	0,51	0,49	0,47	0,45	0,43	0,41	0,39	0,37	0,36	0,34	0,33	0,33
Discounted Cash-flow	**354,70**	**342,15**	**330,01**	**318,28**	**306,95**	**296,00**	**285,42**	**275,20**	**265,33**	**255,80**	**246,60**	**237,71**	**229,13**	**31,44**

Portugal

Millions €	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
EBITDA	133,99	139,38	153,10	154,78	156,58	158,40	160,25	162,11	164,00	165,90	167,06	127,33	128,73
Provisions (Change)	-0,42	-0,35	-0,74	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Depreciation and Amortization	-35,05	-36,41	-39,32	-39,32	-39,32	-39,32	-39,32	-39,32	-39,32	-39,32	-39,32	-39,32	-39,32
Amortization of Deferred Income (governement grants)	0,93	0,93	0,93	0,93	0,93	0,93	0,93	0,93	0,93	0,93	0,93	0,93	0,93
EBIT	**99,45**	**103,55**	**113,97**	**116,39**	**118,19**	**120,01**	**121,86**	**123,72**	**125,60**	**127,51**	**128,67**	**88,94**	**90,34**
Tax rate	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%
NOPLAT	74,48	77,55	85,35	87,17	88,51	89,88	91,26	92,65	94,07	95,49	96,36	66,61	67,66
Depreciation and Amortization	35,05	36,41	39,32	39,32	39,32	39,32	39,32	39,32	39,32	39,32	39,32	39,32	39,32
CAPEX	69,85	67,05	63,21	63,21	63,21	66,37	66,37	66,37	66,37	66,37	66,37	66,37	66,37
Changes in Net Working Capital	-19,01	-10,39	-4,49	-3,61	0,40	-0,38	7,39	6,69	6,16	5,95	13,59	-10,47	-1,47
CF to be discounted	**58,69**	**57,30**	**65,96**	**66,89**	**64,23**	**63,21**	**56,82**	**58,91**	**60,85**	**62,49**	**55,73**	**50,03**	**42,08**
Discount Factor	1,00	0,96	0,91	0,87	0,84	0,80	0,76	0,73	0,70	0,67	0,64	0,61	0,58
Discounted Cash-flow	**58,69**	**54,79**	**60,29**	**58,46**	**53,66**	**50,49**	**43,39**	**43,01**	**42,48**	**41,70**	**35,55**	**30,52**	**24,54**

Re Unlevered	5%
PV of FCFF+TV	896

Portugal

Millions €	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	TV
EBITDA	130,15	131,58	133,03	134,49	135,97	137,46	138,98	140,51	142,05	143,61	145,19	146,79	148,40	
Provisions (Change)	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	
Depreciation and Amortization	-39,32	-39,32	-39,32	-39,32	-39,32	-39,32	-39,32	-39,32	-39,32	-39,32	-39,32	-39,32	-39,32	
Amortization of Deferred Income (governement grants)	0,93	0,93	0,93	0,93	0,93	0,93	0,93	0,93	0,93	0,93	0,93	0,93	0,93	
EBIT	**91,76**	**93,19**	**94,63**	**96,10**	**97,58**	**99,07**	**100,59**	**102,11**	**103,66**	**105,22**	**106,80**	**108,40**	**110,01**	
Tax rate	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	
NOPLAT	68,72	69,79	70,87	71,97	73,08	74,20	75,33	76,47	77,63	78,80	79,98	81,18	82,39	
Depreciation and Amortization	39,32	39,32	39,32	39,32	39,32	39,32	39,32	39,32	39,32	39,32	39,32	39,32	39,32	
CAPEX	66,37	66,37	66,37	66,37	66,37	66,37	66,37	66,37	66,37	66,37	66,37	66,37	66,37	
Changes in Net Working Capital	-1,83	-1,88	-1,93	-1,99	-2,05	-2,11	-2,17	-2,24	-2,31	-2,38	-2,46	-2,54	-2,62	
CF to be discounted	**43,50**	**44,62**	**45,76**	**46,91**	**48,08**	**49,26**	**50,45**	**51,67**	**52,89**	**54,14**	**55,40**	**56,67**	**57,96**	**58,99**
Discount Factor	0,56	0,53	0,51	0,49	0,47	0,45	0,43	0,41	0,39	0,37	0,36	0,34	0,33	0,33
Discounted Cash-flow	**24,25**	**23,78**	**23,32**	**22,85**	**22,39**	**21,94**	**21,48**	**21,03**	**20,58**	**20,14**	**19,70**	**19,27**	**18,84**	**19,18**

NA

Millions €	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
EBITDA	387,43	446,21	565,98	601,50	597,54	594,23	612,08	622,77	633,74	644,99	655,85	666,99	678,40
Provisions (Change)	1,06	-4,25	-3,86	-2,41	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Depreciation and Amortization	-256,15	-291,53	-320,30	-333,82	-326,11	-318,86	-318,86	-318,86	-318,86	-318,86	-318,86	-318,86	-318,86
Amortization of Deferred Income (governement grants)	14,80	14,73	14,52	14,23	13,90	13,59	13,59	13,59	13,59	13,59	13,59	13,59	13,59
EBIT	**147,14**	**165,15**	**256,35**	**279,49**	**285,33**	**288,95**	**306,80**	**317,50**	**328,47**	**339,71**	**350,58**	**361,72**	**373,12**
Tax rate	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%
NOPLAT	110,19	123,68	191,98	209,31	213,68	216,40	229,77	237,77	245,99	254,41	262,55	270,89	279,43
Depreciation and Amortization	256,15	291,53	320,30	333,82	326,11	318,86	318,86	318,86	318,86	318,86	318,86	318,86	318,86
CAPEX	325,00	331,50	299,00	325,00	338,00	338,00	338,00	338,00	338,00	338,00	338,00	338,00	338,00
Changes in Net Working Capital	-53,44	-55,71	-24,25	-30,85	1,60	-1,52	29,70	26,89	24,77	23,93	54,62	-42,07	-5,93
CF to be discounted	**94,78**	**139,43**	**237,53**	**248,98**	**200,19**	**198,78**	**180,93**	**191,74**	**202,08**	**211,35**	**188,80**	**293,82**	**266,22**
Discount Factor	1,00	0,96	0,91	0,87	0,83	0,80	0,76	0,73	0,69	0,66	0,63	0,60	0,58
Discounted Cash-flow	**94,78**	**133,18**	**216,73**	**217,01**	**166,67**	**158,08**	**137,44**	**139,13**	**140,06**	**139,92**	**119,40**	**177,49**	**153,62**

Re Unlevered	5%
PV of FCFF+TV	3.866

NA

Millions €	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	TV
EBITDA	690,08	702,06	714,34	726,91	739,80	753,01	766,55	780,42	794,64	809,22	824,16	839,47	855,17	
Provisions (Change)	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	
Depreciation and Amortization	-318,86	-318,86	-318,86	-318,86	-318,86	-318,86	-318,86	-318,86	-318,86	-318,86	-318,86	-318,86	-318,86	
Amortization of Deferred Income (governement grants)	13,59	13,59	13,59	13,59	13,59	13,59	13,59	13,59	13,59	13,59	13,59	13,59	13,59	
EBIT	**384,81**	**396,79**	**409,06**	**421,64**	**434,53**	**447,74**	**461,28**	**475,15**	**489,37**	**503,95**	**518,89**	**534,20**	**549,90**	
Tax rate	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	
NOPLAT	288,19	297,16	306,35	315,77	325,42	335,31	345,45	355,84	366,49	377,41	388,59	400,06	411,82	
Depreciation and Amortization	318,86	318,86	318,86	318,86	318,86	318,86	318,86	318,86	318,86	318,86	318,86	318,86	318,86	
CAPEX	338,00	338,00	338,00	338,00	338,00	338,00	338,00	338,00	338,00	338,00	338,00	338,00	338,00	
Changes in Net Working Capital	-7,33	-7,56	-7,76	-7,99	-8,23	-8,47	-8,73	-9,00	-9,28	-9,57	-9,88	-10,20	-10,53	
CF to be discounted	**276,38**	**285,57**	**294,97**	**304,62**	**314,51**	**324,65**	**335,04**	**345,70**	**356,63**	**367,84**	**379,33**	**391,12**	**403,21**	**152,57**
Discount Factor	0,55	0,53	0,50	0,48	0,46	0,44	0,42	0,40	0,38	0,36	0,35	0,33	0,32	0,32
Discounted Cash-flow	**152,34**	**150,35**	**148,35**	**146,34**	**144,32**	**142,30**	**140,28**	**138,26**	**136,24**	**134,23**	**132,22**	**130,23**	**128,24**	**48,52**

Bibliography

Asquith, Paul, Michael B. Mikhail, and Andrea S. Au. "Information content of equity analyst reports." *Journal of financial economics* 75.2 (2005): 245-282.

Blacconiere, Walter G., Marilyn F. Johnson, and Mark S. Johnson. "Market valuation and deregulation of electric utilities." *Journal of Accounting and Economics* 29.2 (2000): 231-260.

Branch, Ben. "The costs of bankruptcy: A review." *International Review of Financial Analysis* 11.1 (2002): 39-57.

Carhart, Mark M. "On persistence in mutual fund performance." The Journal of finance 52.1 (1997): 57-82.

Cassia, Lucio, Andrea Plati, and Silvio Vismara. "Equity valuation using DCF: A theoretical analysis of the long term hypotheses." *Investment Management and Financial Innovations* 4.1 (2007): 91-108.

Cegłowski, Bartlomiej, and Blażej Podgórski. "Equity shares equating the results of FCFF and FCFE methods." *e-Finanse: Financial Internet Quarterly*8.2 (2012): 34-43.

Cobb, Barry R., and John M. Charnes. "Real options valuation." *Proceedings of the 39th conference on Winter simulation: 40 years! The best is yet to come*. IEEE Press, 2007.

Cooper, Ian A., and Leonardo Cordeiro. "Optimal equity valuation using multiples: The number of comparable firms.", (2008).

Damodaran, A. (2011), "Equity Risk Premiums (ERP): Determinants, Estimation and Implications" - The 2011 Edition. New York: Stern School of Business.

Damodaran, Aswath. "Estimating equity risk premiums." (1999).

Damodaran, Aswath. "Estimating risk free rates." *WP, Stern School of Business, New York* (1999).

Damodaran, Aswath. "Valuation approaches and metrics: A survey of the theory and evidence". Now Publishers Inc, 2005.

Damodaran, Aswath. "Investment valuation: Tools and techniques for determining the value of any asset". John Wiley & Sons, 2012.

Fama, Eugene F., and Kenneth R. French. "Common risk factors in the returns on stocks and bonds." Journal of financial economics 33.1 (1993): 3-56.

Fama, Eugene F., and Kenneth R. French. "The cross-section of expected stock returns." *the Journal of Finance* 47.2 (1992): 427-465.

Fernández, P, "Valuing Real Options: Frequently Made Errors", IESE Business School.(2002).

Fernández, P. “80 common errors in company valuation”, IESE Business School, (2004).

Fernandez, Pablo. "Company valuation methods." *Available at SSRN 274973* (2013).

Fernández, Pablo. "The value of tax shields is NOT equal to the present value of tax shields." *Journal of Financial Economics* 73.1 (2004): 145-165.

Fernandez, Pablo. "Valuation using multiples. How do analysts reach their conclusions?." IESE Business School, (2001).

Fernandez, Pablo. "WACC: Definition, Misconceptions, and Errors." *Business Valuation Review* 29.4 (2010): 138-144.

Fernandez, Pablo. “Valuation methods and shareholder value creation”. Academic Press, 2002.

Fuller, Russell J. "Programming the Three-Phase Dividend Discount Model." *The Journal of Portfolio Management* 5.4 (1979): 28-32.

Goedhart, Marc, Timothy Koller, and David Wessels. "The right role for multiples in valuation." McKinsey on Finance 15 (2005): 7-11.

Gordon, Myron J., and Eli Shapiro. "Capital equipment analysis: the required rate of profit." Management science 3.1 (1956): 102-110.

Green, Richard, and Nicholas Vasilakos. "The economics of offshore wind."*Energy Policy* 39.2 (2011): 496-502.

Holmberg, Stevan R. “Investor Risk and Required Return in Regulated Industries”. *Nebraska Journal of Economics and Business*, Vol. 16, No. 4 (Autumn, 1977), pp. 61-74.

Holmberg, Stevan R. “Investor Risk and Required Return in Regulated Industries”. *Nebraska Journal of Economics and Business*, Vol. 16, No. 4 (Autumn, 1977), pp. 61-74.

Kim, Moonchul, and Jay R. Ritter. "Valuing IPOs." *Journal of financial economics* 53.3 (1999): 409-437.

Lie, Erik, and Heidi J. Lie. "Multiples used to estimate corporate value."*Financial Analysts Journal* (2002): 44-54.

Liu, Jing, Doron Nissim, and Jacob Thomas. "Equity valuation using multiples."*Journal of Accounting Research* 40.1 (2002): 135-172.

Luehrman, Timothy A. "Using APV (adjusted present value): a better tool for valuing operations." Harvard Business Review 75.3 (1996): 145-6.

Luehrman, Timothy A. "What’s it worth." Harvard Business Review 75.4 (1997): 132-142.

Méndez, Mariano, Alfredo Goyanes, and Prosper Lamothe. "Real options valuation of a wind farm." *Universia Business Review* (2009).

Menegaki, Angeliki. "Valuation for renewable energy: a comparative review."*Renewable and Sustainable Energy Reviews* 12.9 (2008): 2422-2437.

Molodovsky, Nicholas, Catherine May, and Sherman Chottiner. "Common Stock Valuation: Principles, Tables and Application." *Financial Analysts Journal* (1965): 104-123.

Ohlson, James A. "Earnings, book values, and dividends in equity valuation*." Contemporary accounting research 11.2 (1995): 661-687

Rosenberg, Barr, and Andrew Rudd. "The corporate uses of beta." The revolution in corporate finance. Basil Blackwell (1992).

Sharpe, William F. "Capital asset prices: A theory of market equilibrium under conditions of risk*." The journal of finance 19.3 (1964): 425-442.

Spremann, Klaus, and Andreas Schreiner. "Equity valuation using multiples: an empirical investigation". Springer, 2009.

Trigeorgis, Lenos. "Real options and interactions with financial flexibility."*Financial Management* (1993): 202-224.

Venetsanos, Konstantinos, Penelope Angelopoulou, and Theocharis Tsoutsos. "Renewable energy sources project appraisal under uncertainty: the case of wind energy exploitation within a changing energy market environment." *Energy Policy* 30.4 (2002): 293-307.

Young, M., P. Sullivan, A. Nokhasteh, and W. Holt. "All Roads Lead to Rome: An Integrated Approach to Valuation Models." Goldman Sachs Investment Research (1999).

Other Research

BP Energy Outlook 2030 (2013)

E.ON Wind Turbine Technology and Operations Factbook (2013)

EDPR, Annual Reports (2012, 2013)

EDPR, Investor Day (2014)

EDPR, Investor Presentation (2014)

European Commission – Directive of the European Parliament and of the Council, COM (2012) 595 Final

European Commission – Trends and developments in European Energy Markets 2014, COM (2014) 634 Final

European Wind Energy Association, "Pure Power", (2009)

Global Wind Energy Council, "Global Wind Energy Outlook", (2012)

Global Wind Energy Council, "Global Wind Report", (2012)

Global Wind Energy Council, "Global Wind Report", (2013)

IRENA, "Renewable Energy Technologies: Cost Analysis Series – Wind Power", Volume 1: Power Sector, Issue 5/5, (2012)

KPMG Taxes and incentives for renewable energy (2014)

Network Industries Quarterly, vol 1, (2011)

WWEA 2014 Half-Report (2014)