Lisbon School of Economics & Management
Universidade de Lisboa

MASTER

FINANCE

MASTER´S FINAL WORK

BUSINESS CASE

DOES THE ISSUE OF GREEN BONDS MATCH EDP´S NEEDS FOR TRANSITION TO A LOW-CARBON ECONOMY?

JOÃO CARLOS SANTOS ANTUNES

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SUPERVISION:
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GLOSSARY

BOFAML – Business of Bank of America Merrill Lynch.

CAPEX – Capital Expenditures.

CBI – Climate Bond Initiative.

COP21 – Conference of the Parties.

EBITDA – Earnings Before Interest, Taxes, Depreciation and Amortization.

EDP – Energias de Portugal.

EDPR – Energias de Portugal Renováveis.

EIB – European Investment Bank.

ESG – Environmental, Social, and Governance.

EU – European Union.

FFO – Funds from Operations.

GBP – Green Bond Principles.

GWH – Gigawatt Hours.

ICE – Intercontinental Exchange.

ICMA – International Capital Market Association.

JEL – Journal of Economic Literature.

MSCI – Morgan Stanley Capital International.

ND – Net Debt.

PWC – Pricewaterhouse Cooper.

SRI – Sustainable and Responsible Investing.

S&P – Standard & Poors.

T/GWH – Tonnes per Gigawatt hours

ABSTRACT, KEYWORDS AND JEL CODES

Nowadays, there is a global threat affecting the planet - climate change - and the world has realized that it is necessary to change behaviours in order to fight against it. The energy sector is considered one of the main vehicles for decarbonization through the use of renewable energies rather than coal and oil, as they represent 40% of CO2 emissions.

This business case provides a look inside EDP, one of the largest utilities, and the financing solution they found to achieve the goal of transitioning to a low-carbon economy, taking into account that renewable energy infrastructures (fundamental to this transition) require large amounts of investment with long maturities.

Green bonds emerged in order to raise funds for eligible green projects and thus try to replace non-renewable sources, such as oil and coal. Over the last few years, there has been a significant increase in the issuance of green bond and in the number of investors interested in financing green projects, as a result of an increase in global environmental awareness.

The purpose of this business case was to find out if green bond issues match the company's main strategic goals. After detailed analysis of the company's strategies, financial and operational ratios, as well as official public documents, the conclusion was that green bond issues really do match the company's financing needs and sustainability strategy towards the transition to a more sustainable economy, and the two main strategic goals: growth and financial risk control.

KEYWORDS: Green Finance; Green Bonds; Climate Change; Deleveraging; Credit Ratings; EDP.

JEL CODES: G12; Q01.

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In addition to public information, I also used documents provided by EDP on a confidential basis, none of which are presented directly in this study.

1. INTRODUCTION

Climate change is on an unprecedented scale, and it may lead to the extinction of various species, a sudden rise in sea level resulting in increased risk of catastrophic flooding and natural resource scarcity. Without drastic and urgent action, it will be increasingly difficult for humans to adapt to the devastating effects of global warming. A shift to climate-resilient, low-carbon growth is required to avert further worsening consequences. One of the solutions for this transition involves investing in renewable energy, so the need arose to understand if there is a sustainable financing solution.

The Paris agreement was adopted on 12 December 2015, representing a major milestone in the fight against climate change. A total of 196 countries adopted this agreement that recognizes the effective and urgent need to respond to climate change. Since the adoption of this agreement, more and more countries and companies (especially in the transportation and energy sectors) have set carbon neutrality targets.

As a consequence of these threats, the need to find a sustainable financial mechanism emerged, resulting in the term green finance, which refers to financial investments focused on the development of sustainable projects. Currently, there is still no commonly accepted and precise definition for green finance.

One of the financial tools identified to help this transition to a more sustainable economy was green bonds, which, according to the GBP, are a type of bond whose proceeds will be entirely assigned to finance eligible green projects that replace environmentally harmful energy sources such as fossil fuel and coal. These green bonds are similar to conventional bonds since they help the issuer raise funds to finance specific projects in exchange for a fixed periodic interest payment and the full repayment of the principal at maturity. The main difference lies in the green label associated with the bond, which assures the investors that the proceeds will be used to finance environmentally beneficial projects.

Throughout the past few years, green bonds have been used to finance environmentally friendly projects has increased exponentially. This increase is motivated by the growing concern, awareness, and consciousness for environmental causes of both investors and issuers who want a shift to a global low-carbon economy.

In 2007, the European Investment Bank (EIB) issued the first green bond for €600 million, with the proceeds being used for renewable energy and energy efficiency. Since then, investment in this emerging market has grown exponentially, with $330 billion in green bonds issued in 2020, according to Bloomberg. However, this amount still represents a niche when compared to the conventional bond market, so it is necessary to attract mainstream investors to finance the transition to a zero-carbon economy.

As the green bond market grows, the need has arisen to find guidelines and standards for the issuance of these bonds.

Although some standards already exist, there is still no generally accepted definition for the green feature in green bonds, and without proper guidelines, the risk of greenwashing arises. Consequently it affects the integrity and reliability of this emerging market and increase the reputational risk for investors and issuers, leading them to abandon the market. Thus, the existence of standards would help increase the credibility of green claims so that investors can be confident that the proceeds will be used for projects that truly have a beneficial impact on the environment.

The most widely used sets of standards are the Green Bond Principles (GBP) and the Climate Bond Initiative (CBI).

The GBP is a set of guidelines designed for wide use by the market, which was introduced in 2014, with the purpose of encouraging and promoting transparency and integrity in the green bond market by recommending issuers to fully disclose and report on the use of proceeds, which would, therefore, increase investor confidence.

On the other hand, the CBI offers a certification system for climate bonds with performance-based minimum standards defined by science-based eligibility criteria within a predefined taxonomy.

Thus, the market would benefit from the existence of widely accepted standards and guidelines that would ensure credibility to the green bond market.

The objective of this business case is, mostly, to assess if this new financial instrument matches EDP's financing needs, which intends a transition to a low-carbon economy and the main strategic goals of growth and lowering risk profile.

To do so, this case will focus on EDP, one of the largest utilities in the world, and its strategic plan for growth and sustainability in order to conclude whether the green bonds already issued have had the intended environmental and economic benefits, through the analysis of operational and financial ratios.

This business case is structured in the following way. In chapter 2, a literature review of the main concepts related to this new financial instrument is presented, starting with the definition of green finance and green bonds, moving on to the event that triggered this growth, the Paris Climate Agreement. Also, this chapter analyses the existence of standards and guidelines for green bonds, as well as an overview of the green bond market, from the first issue in 2007 to the present day.

In chapter 3, the history of EDP, the largest vertically integrated utility in Portugal, will be introduced, followed by an overview of the utilities sector currently, followed by a detailed analysis of EDP's strategic growth and sustainability plan and EDP's green bond issues along with the introduction of some essential concepts to understand EDP's issues, such as hybrid bonds and credit ratings. In the last section of this chapter, In the last part of this chapter, a data analysis will be performed through the review of operational and financial ratios and the presentation of an evaluation of the impact of these green emissions on the company, considering its strategic plan.

In the fourth and last chapter, a conclusion to the business case question will be delivered.

2. LITERATURE REVIEW

2.1 GREEN FINANCE

In recent years, a growing need has emerged to find more sustainable financial mechanisms to fight against one of the greatest threats of modern times, climate change.

In the wake of this threat, the term green finance has emerged, a term that has no accurate, commonly accepted definition, as the definitions proposed in the literature vary significantly.

Green Finance is a widely used term for financial investments focused on the development of sustainable projects, initiatives and policies that encourage the development of a more sustainable economy, not limited to climate finance (IDFC, 2014).

As of today, there is no exact and widely accepted definition of green finance for two reasons. First, many literatures do not attempt to define the term, and secondly, the definitions proposed in the literature differ substantially.

To the banking sector, according to PWC, green finance is defined as a financial product or service provided with the purpose of promoting environmentally responsible investments and stimulating clean technologies, projects, or businesses, where the environmental impact is a pivotal factor during the loan decision process.

Thus, green finance covers public or private financing of green investments in areas related to environmental goods and services (for instance biodiversity preservation), prevention and minimization of damages to the environment (for example energy efficiency) and public policies that encourage the implementation of projects that mitigate the damage to the environment. Some examples of components of the financial system that are designed for green investment are the Green Climate Fund and financial instruments (such as structured green funds and green bonds) (Lindenberg, 2014).

2.2 GREEN BONDS

According to the GBP, the definition of green bonds comprises a type of bond where the proceeds will be exclusively applied to finance projects that result in a clear positive impact to

the environment, i.e. eligible green projects that are aligned with the four main components presented in the GBP.

Green bonds are similar to a conventional bond in the sense that both bonds help the issuer raise funds for specific projects or ongoing businesses in exchange for a fixed periodic interest payment (coupon) and a full repayment of the principal at maturity. The main difference is the green feature of the bond that assures the investor that the proceeds will be used to fund projects with clear benefits to the environment. Essentially, the green bond market facilitates the interaction between investors and sustainable projects such as renewable energies, the main recipient of funds from this market. So, the specific use of the funds raised distinguishes green bonds from regular bonds.

Green bonds have been attractive to investors in the growing segment focused on sustainable and responsible investing (SRI) and investors that analyse and make an investment decision taking into consideration the ESG (environmental, social, and governance) criteria. More than that, green bonds are an important and effective financial instrument to raise awareness about projects that contribute to facing climate change and other environmental threats.

So, according to the World Bank, the benefits for green bond issuers comprise investor diversification, enhanced investor engagement, improved awareness of an issuer's operations, and contributing to the development of a market that helps attract public and private financing for environmentally friendly projects.

The market price of green bonds is determined in a similar way to a conventional bond, namely by considering the market conditions at the time of issuance. Therefore, it is widely accepted that the 2 types of bonds are similarly priced, because investors are not willing to give up on their return or pay more for the green aspect of the bond.

2.3 PARIS AGREEMENT

On 12 December 2015, the Paris agreement was adopted by 196 countries at COP21 in Paris, entering into force on 4 November 2016. Under this agreement, the parties recognize that an effective and urgent response is needed to combat climate change.

The objectives present in this agreement, which serve as a guide for all parties, are the following:

- Hold the global average temperature increase below 2°C above pre-industrial levels and limit temperature increase to 1.5°C above pre-industrial levels;
- Make financial streams consistent with a path to lower greenhouse gas emissions and climate-resilient development;
- Limit the human emissions of greenhouse gases to the same levels that trees, soil, and oceans can naturally absorb;
- Finance developing countries to mitigate the consequences caused by climate change, strengthen resilience and improve capacities to adapt to environmental impacts.

The commitments of the countries must be reviewed every five years. The years after the Paris agreement have already triggered low-carbon solutions and new markets with the increase in the number of countries and companies establishing carbon neutrality targets, since zero-carbon solutions are becoming increasingly competitive in all economic sectors, especially in the energy and transportation sectors that have already created several business opportunities. However, drastic action on climate change is still necessary to achieve the goals established in the Paris Agreement.

Hence, the parties aim to reach a peak in global greenhouse gas emissions the soonest possible to achieve a climate-neutral world by mid-century.

2.4 GREEN BOND STANDARDS

Despite the existence of different guidelines and standards, there is still no generally accepted definition for the green aspect in green bonds already issued.

Without proper standards, there is a risk of greenwashing, i.e., the existence of bonds labelled as green that in fact provide few environmental benefits. Therefore, greenwashing can potentially damage the integrity and trustworthiness of this emerging market and increase the reputational risk for investors and issuers, which may lead to the distancing of potential issuers from the market, as well as constrain the appetite of institutional investors.

Hence, the existence of standards for these green issues will increase the transparency and comparability of green bonds, thus making the investment process more efficient for mainstream investors, essential for the transition to a more sustainable economy (KPMG, 2016).

The most widely used sets of standards are the Green Bond Principles (GBP) and the Climate Bond Initiative (CBI).

The GBP are a set of guidelines designed for broad market use, which were introduced in 2014 to encourage and promote transparency and integrity in the deployment of the green bond market by advising issuers of full disclosure and reporting on the use of proceeds to therefore increase investor confidence in the issue.

Thus, GBP is intended to provide issuers with guidance on the key elements needed to launch a credible green bond that reflects the issuer's level of sustainability commitments, thereby supporting investors by fostering the availability of the information needed to assess the environmental impact that their green bond investment will achieve. Therefore, a GBP-aligned issue must deliver clear green credentials.

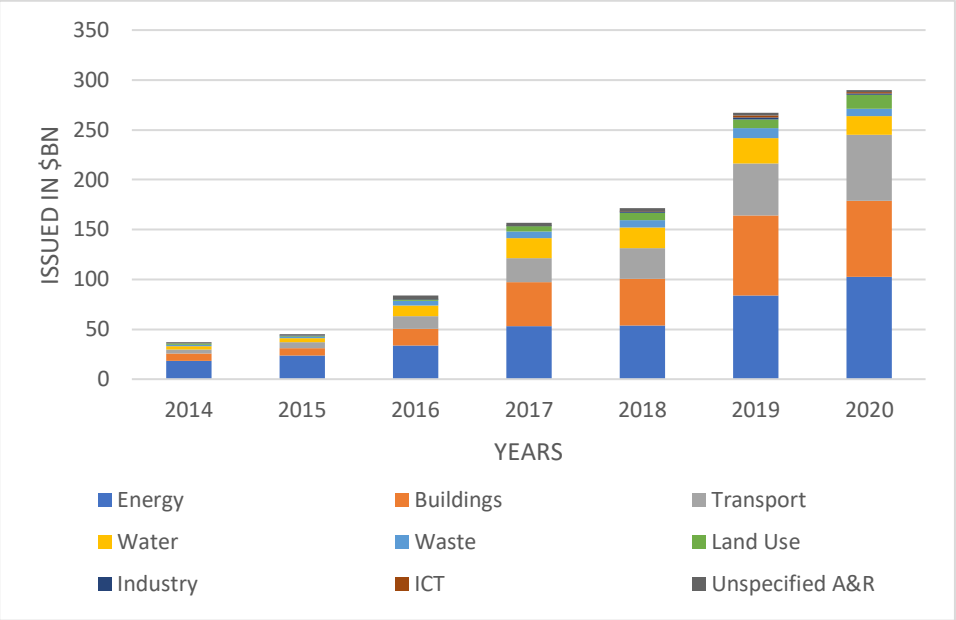
The four core components for a GBP-aligned issue are:

1. Use of Proceeds

The green bond issuer must specify in the legal documentation of the bond where the proceeds will be used. The proceeds must be used for eligible green projects that provide clear environmental benefits.

Energy, building and mobility represent the three largest categories where proceeds are applied, altogether contributing 85% to the 2020 total use of proceeds (see Figure 1).

Figure 1 – Use of Proceeds



Source: CBI

2. Process for Project Evaluation and Selection

The Green Bond issuer must provide transparent disclosure to investors of the environmental sustainability objectives of eligible Green Projects.

3. Management of Proceeds

The net proceeds of the Green Bond must be managed properly in a sub-account or followed and attested by the issuer in a formal internal process.

4. Reporting

Issuers are required to report in the annual report the projects where the proceeds have been applied, along with a detailed description of the projects, the amounts allocated and their estimated impact.

The CBI concentrates on providing a rapid transition to a low-carbon future without addressing other environmental problems such as biodiversity. To this end, it offers a climate bond certification system with performance-based minimum standards defined by science-based eligibility criteria within a predefined taxonomy. While it has developed a detailed

taxonomy for climate bonds, it has not yet developed a generally accepted definition for green bonds.

The absence of widely accepted standards, guidelines and definitions, combined with the diversity of market practices, generates complexity among issuers and investors, reducing their confidence, crucial for the long-term growth of the green bond market.

2.5 GREEN BOND MARKET

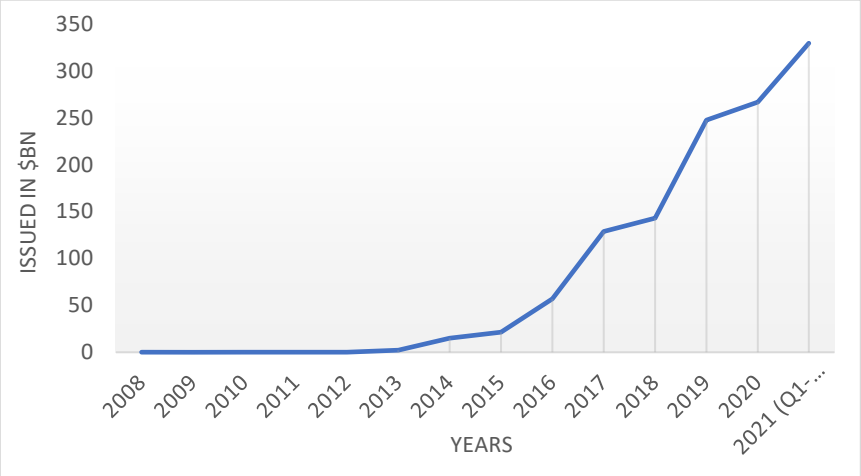
Throughout the past few years, there has been a booming investment in the green bond market. It all started in 2007 with the EIB issuing the first green bond, a €600 million Climate Awareness Bond focused on renewable energy and energy efficiency.

In 2008, the World Bank launched the first green bond in the amount of, approximately, US$440 million. As of the end of June 2015, the World Bank has issued US$8.5 billion in over 100 green bond transactions in 18 currencies, supporting about 70 climate mitigation and adaptation projects around the developing world.

In 2019, BloombergNEF reported a total issuance of $271 billion, which represented only 4% of total bond issuance worldwide, which suggests that green bonds still do not represent much in the bond market.

According to The Economist, this reduced share in the bond market is explained by the unclear benefits of green bond issuance, the perception that this type of issue is more complex and has higher costs when compared to a normal bond issue, lack of standardization in the market, fear of greenwashing and, taking into account that it is still a relatively recent market, there is still no good credentials for issuers or enough supply to meet investor's demand (see Figure 2).

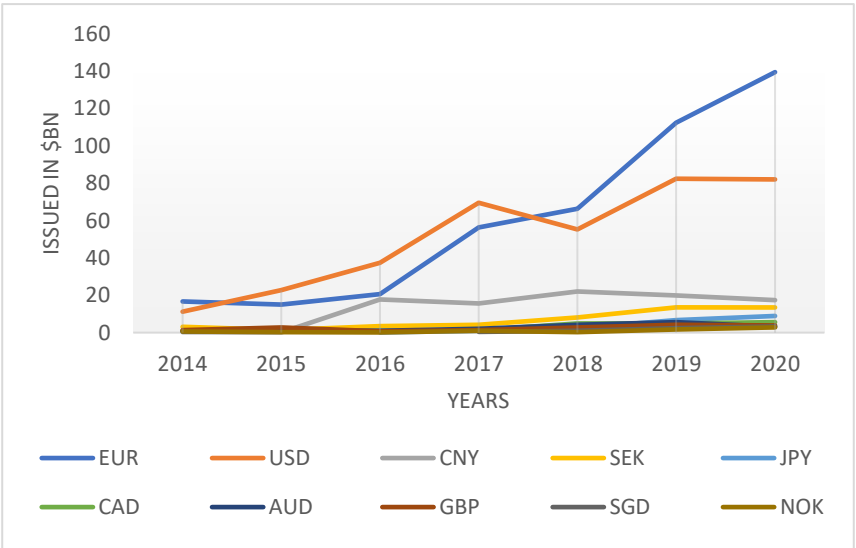
Figure 2 – Green Bond Issuance Evolution



Source: Bloomberg

The growing interest in investing in the green bond market is driven by increased government support through measures and incentives to foster the green bond market and increased interest in ESG investments, since there is a growing awareness of ESG issuers and a rising interest by investors in sustainable investments, and although green bond issues are dominated by Europe and the United States, developing countries have been increasing their investment in this market (see Figure 3).

Figure 3 – Green Bond Issuance per Currency



Source: CBI

3. CASE

3.1 COMPANY HISTORY

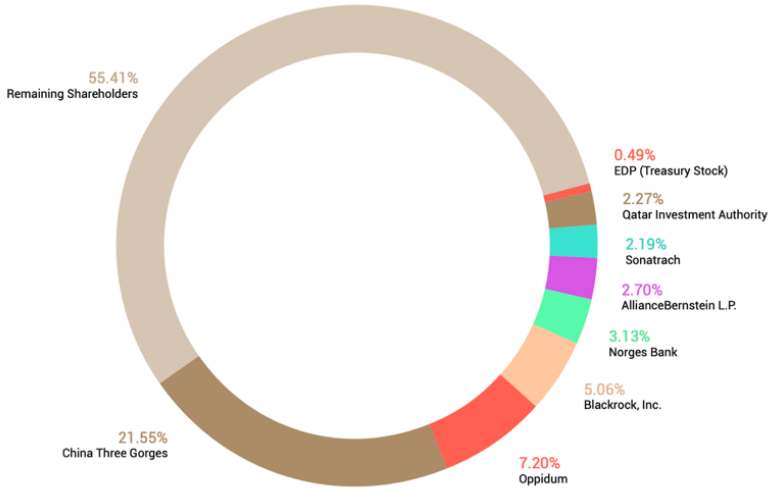
Since the early days of the introduction of electricity in Portugal, its generation and distribution were ensured in a decentralized manner, by companies of regional scope.

On 30th June 1976, during the sixth provisional government, through the Decree-Law of the Ministry of Industry and Technology, Electricidade de Portugal - Empresa Pública (EDP) was created, which resulted from the merger of 13 previously nationalized companies, with the aim of providing access to electricity to the greater number of people in Portugal.

EDP, with head office in Lisbon, took control of nearly the entire electricity generation and distribution business in Portugal and was responsible for the electrification of the entire country, the modernization, and extension of the electricity distribution networks, the planning, and construction of the national electricity generation park and the establishment of a single tariff for all customers.

In 1991, the Portuguese Government decided to change EDP's legal status from a state-owned company to a joint stock company controlled by the State. Later, in 1997, after the restructuring and formation of the EDP Group, the first of five privatization processes of the company were initiated. After the privatization process was completed, the Portuguese State retained 30% of the capital, with the remaining 70% remaining in private hands.

Figure 4 – EDP Shareholder´s Structure



Source: EDP Annual Report 2020

EDP is the largest vertically integrated utility in Portugal. EDP's activity consists in four phases of the energy chain:

1. Generation: power plants transform the various energy sources into electricity. These energy sources may be of renewable origin (water, wind and sun) or non-renewable (coal, natural gas, nuclear and cogeneration);
2. Transmission: energy generated is channeled to the distribution network;
3. Distribution: transported energy is channeled to the distribution grid;
4. Supply: distributed energy arrives at the supply point and is sold by the supplier.

EDP, through its fully consolidated subsidiary EDP Renováveis (one of the world's largest renewable energy companies), uses net proceeds from the issuance of green bonds to finance or refinance planned or existing investments to support the transition to a low-carbon economy.

The purpose of EDP Renováveis activity is to develop, construct, operate and maintain eligible green projects, such as wind power plants and solar power plants to generate and distribute clean energy, reducing the CO2 emissions. Furthermore, all projects based on fossil fuel and hydro energy production, transmission and distribution are automatically excluded.

EDP Green Bond Framework is aligned with the GBP, drawn up by the International Capital Market Association (ICMA).

EDP is recognized, since 2008, by Dow Jones Sustainability indexes as one of the most sustainable companies in the world.

Currently, EDP is the fourth largest wind energy company in the world and 74% of its energy is produced from renewable resources. It is present in 22 countries on 4 continents with over 12100 employees.

3.2 INDUSTRY OVERVIEW

The electricity sector is becoming more and more important, as we observe a clear transition from fossil fuels to other sources such as wind, solar, geothermal and hydropower for electricity production, this transition will increase the extent of electricity use in all activities, particularly in transportation (Martinez, 2019).

According to a study conducted by Deloitte, there has been an increase in new entrants to this market, including some of the major oil companies, as a result of significant growth in renewables and clean technologies.

Over the last few years, we have seen states, utilities, and companies continue to announce plans to decarbonize and fight climate change despite the current global pandemic and economic recession.

As the energy industry accelerates with the potential to increase demand for renewable energy through growing environmental awareness, oil and gas companies are planning to increase their participation in the electricity value chain, these trends are supporting the energy transition.

According to Deloitte, renewable energy-related business is expected to increase by 2021 as companies, utilities, and governments prepare to meet ambitious climate targets.

In November 2019, European Investment Bank (EIB) announce that it will stop financing any fossil fuel projects until the end of 2021.

EDP joined other utilities to push the European Union to formally commit to achieving carbon neutrality by 2050 and to target a greenhouse gas emissions reduction of at least 55% by 2030. One example is Engie, a French utility that issued the largest-ever green bond (a €2.5 billion bond) in May 2014, to fund renewable energy projects.

EDP was the first Portuguese company to launch a green debt instrument, having already issued the equivalent to €6 billion in Green Bonds.

Thus, EDP is the most active issuer in the green debt segment and has been using the proceeds to finance investment in renewable projects.

3.3 THE SITUATION

The world faces a period of urgent need to decarbonize as a result of climate change. Power utilities represent 40% of total emissions triggering the need to invest in renewable energy to reduce coal.

Given this context of global concern with the environment, EDP, as one of the largest utilities in the world is committed to the process of transition to a zero-carbon economy, in line with the Paris Agreement and the EU's obligations to establish long-term low-emission

strategies by 2020 and be 100% green by 2030. To approach the decarbonization challenge on the generation side, EDP is turning to some low-carbon technologies, such as renewable energy.

Prior to the issuance of the first green bond in 2018, the company's growth strategy for the following years (2019-2022) was based on 4 pillars: financial deleveraging, increased operational efficiency, low risk exposure and low exposure to CO2 through the investment in renewables. The key priority of deleveraging is to reduce net debt to EBITDA in order to reinforce investment grade rating by improving credit ratios (target BBB rating in 2022).

This transition to a low-carbon economy requires significant investment in renewable energy, however shareholders were reluctant to provide the necessary capital. Therefore, it is necessary to find a way to finance this transition in accordance with the company's strategy, which includes deleveraging, growth focused on renewables, improvement of the credit rating, reinforcement of the focus on energy efficiency and strengthening of the low-risk profile while maintaining attractive and sustainable returns for shareholders.

Thus, EDP started issuing green bonds, the first being issued in October 2018. Currently, 9 green bonds have already been issued which amounts to approximately €6400 millions, where €3500 millions of which represents green hybrid bonds and the remaining senior debt.

In the table below, we may observe, on Table 1, each of the emissions in detail:

Table I – EDP Green Bonds Issues

Issuance Date	Type of Bond	Currency	Amount	Coupon	First Call Date	Maturity
October-18	Senior	EUR	600M	1,875%	-	October-25
January-19	Hybrid	EUR	1000M	4,496%	5 years	April-79
September-19	Senior	EUR	600M	0,375%	-	September-26
January-20	Hybrid	EUR	750M	1,700%	5,25 years	July-80
April-20	Senior	EUR	750M	1,625%	-	April-27
September-20	Senior	USD	850M	1,710%	-	January-28
January-21	Hybrid	EUR	750M	1,875%	5,25 years	August-81
September-21	Hybrid	EUR	750M	1,500%	5,25 years	March-82
September-21	Hybrid	EUR	500M	1,875%	7,75 years	March-82

Source: EDP

In sectors where large amounts of investment (CAPEX) are required, such as utilities, hybrid bonds provide financing for long-term investments without deteriorating the financial profile of the issuer (preventing a rating downgrade).

Briefly, hybrid bonds are subordinated debt instruments issued by non-financial companies, which combine bond characteristics (coupon payment, not guaranteed) with equity characteristics (very long maturity).

Nevertheless, there are some risks associated with this financial instrument, such as volatility and subordination risk, which means that in case of default of the issuer, the holders of senior debt, payments of salaries, taxes, and other guaranteed debts have priority over hybrid bonds, leading to a relatively low rate of recovery of this security. However, hybrid issuers usually have a high-quality financial profile since most of them are investment grade rated, so the risk of default is lower.

Green bonds with callable option, while being a long maturity financial instrument, allow the issuer to exercise the right of early redemption at par, or at a small premium to par on specified call dates (the first call date is usually 5 to 10 years after the issue date). There can be several call dates throughout the life of the bond. This option gives the issuer the ability to redeem before maturity and, if interest rates fall, to refinance with other bonds at a lower coupon rate, reducing interest expenses.

The first call date concept provides protection to bondholders, since bonds cannot be redeemed too soon, allowing investors to receive some coupon payments. Bonds with this option tend to be worth less, so to attract investors, issuers offer higher coupon rates on callable bonds. Hybrid bonds are usually redeemed on the first call date, it is rare for the issuer not to exercise the call.

Credit ratings have an important role in EDP's strategy as ratings express the ability of the issuer to repay its debts, thus facilitating the process of issuing bonds or notes and providing an efficient, widely recognized, and long-standing measure of relative credit risk.

The credit ratings represent the independent opinion of credit agencies (for instance Standard & Poor’s, Moody’s, and Fitch), which elaborate these ratings based on a number of factors that together will give rise to the rating. It is important to mention that each agency has its own methodology for assessing creditworthiness.

There are some important factors in the agencies' analysis such as country and industry risk, financial ratios, capital structure, financial policy, governance, and competitive position. To achieve the rating, agencies evaluate all available historical and current information (management forecast, risk reports, background, and macroeconomic data and mate events) to

assess the impact of potential foreseeable future events. Issues are investment grade whenever they have a high level of credit quality and creditworthiness. In contrast, ratings below BB are considered non-investment grade, which means that the company's likelihood of being able to repay debt securities becomes speculative due to significant uncertainties, such as financial and business circumstances that may affect credit risk.

Figure 5 – Ratings per Agency

	Moody´s	S&P	Fitch
Investment Grade	Aaa	AAA	AAA
	Aa1	AA+	AA+
	Aa2	AA	AA
	Aa3	AA-	AA-
	A1	A+	A+
	A2	A	A
	A3	A-	A-
	Baa1	BBB+	BBB+
	Baa2	BBB	BBB
	Baa3	BBB-	BBB-
Non-Investment Grade	Ba1	BB+	BB+
	Ba2	BB	BB
	Ba3	BB-	BB-
	B1	B+	B+
	B2	B	B
	B3	B-	B-
	Caa1	CCC+	CCC+
	Caa2	CCC	CCC
	Caa3	CCC-	CCC-
	Ca	CC	CC
	C	C	C
		RD	RD
		D	D

These terms are market convention and do not imply any investment recommendation by the agency on a particular security, they indicate credit risk. In the case of S&P and Fitch, the ratings from AA through CCC carry an additional +/- to indicate relative differences of probability of recovery or default (see Figure 5 above).

Changes in the overall business environment such as recession, industry-specific problems, or company financial problems can lead to a downgrade of the security rating and eventually to the loss of the investment grade rating. A downgrade complicates the company's search for financing, since the risk of default increases, and the company will have to attract investors with higher coupon rates.

Therefore, if the rating agency anticipates that the credit rating may change within 1 to 2 years, it may issue an updated rating outlook indicating whether a possible change could be "positive", "negative", "stable" or "developing". Ratings below BBB- do not carry outlooks because of the high volatility.

Yields associated to green emissions have been falling as a result of increased awareness of environmental concerns leading to an increase in demand for sustainable forms of investment.

3.4 DATA ANALYSIS

The two key cornerstones in the company's strategic plan for growth and sustainability consist in deleveraging to improve its credit rating and, thus, benefit from better financing conditions, essential for the second key objective, which is the transition to a low-carbon economy, that requires a major investment in renewable energy infrastructure, seen as the main alternative to oil and coal. Therefore, we will evaluate whether the issuance of green hybrid bonds has contributed to the accomplishment of these cornerstones of EDP´s strategic plan.

EDP is committed with the process of transition to a low carbon economy, in line with the Paris agreement and the EU's obligations to establish long term low emission strategies by 2020 and to reduce its emissions by 40% by 2030.

EDP believes that Green Bonds are an important financial instrument to encourage the transition to a more sustainable economy, by providing financial support to projects with positive impacts on the environment. So, the company issued a total of 9 green bonds, out of which 5 are hybrids. By issuing bonds with the green label, EDP signals the market that it is seeking sustainable financing to invest in planned or existing projects that support the transition to a low-carbon economy, particularly those that help increase renewable energy production. On the other hand, EDP issues hybrid-labelled bonds with the purpose of improving its rating and deleveraging, because for rating calculations, rating agencies consider them 50% equity and 50% debt, so issuing hybrid bonds focuses on the company's aim of deleveraging and consequently improving its leverage and rating ratios.

When issuing bonds with these two characteristics, i.e., green hybrid bonds, EDP is demonstrating to the market that wants to deleverage, improve its credit rating, reduce its risk profile, and distinguish itself in the transition to a more sustainable economy and thereby raise the amount of capital needed to attain the objectives of its organic and sustainable growth plan. Increasingly, there is an exponential growth in the number of investors interested in investing in sustainable, low-risk projects.

EDP is currently rated BBB- by S&P and Fitch and Baa3 by Moody's (see Table II). This rating gives a signal to investors that expectations of default risk are low, i.e., the ability to pay financial commitments is considered adequate, however, adverse business or economic conditions may reduce this capacity. EDP's goal consists in getting an upgrade to BBB, thereby achieving improved financing conditions through the reduction of the coupon rate paid to investors due to the reduction of the default risk. In 2020, Fitch revised EDP's outlook to positive (see Table III).

Table II – EDP Long-Term Ratings

EDP Long-Term Ratings	2015	2016	2017	2018	2019	2020
S&P	BB+	BB+	BBB-	BBB-	BBB-	BBB-
Moody´s	Baa3	Baa3	Baa3	Baa3	Baa3	Baa3
Fitch	BBB-	BBB-	BBB-	BBB-	BBB-	BBB-

Source: EDP

Table III – EDP Outlook

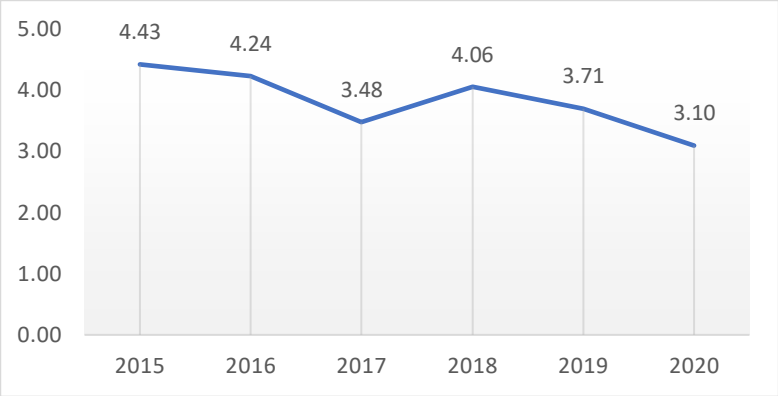
EDP Outlook	2015	2016	2017	2018	2019	2020
S&P	Positive	Positive	Stable	Stable	Stable	Stable
Moody´s	Stable	Stable	Stable	Stable	Stable	Stable
Fitch	Stable	Stable	Stable	Stable	Stable	Positive

Source: EDP

Over the last few years, EDP has focused on improving its financial ratios, for which it has implemented strategies such as issuing hybrid bonds in an attempt to deleverage and achieve a rating upgrade.

Since 2015, EDP's net debt has been reduced by approximately 5 billion euros, which brought it closer to its target of reaching a Net Debt-to-EBITDA ratio of 3x. The lower this ratio, the greater the probability that the company will manage to pay its debts, while values above 3 or 4 are seen as red flags and indicate that the company may be financially distressed in the future. EDP went from 4.43x in 2015 to 3.1x in 2020, indicating that the company has been significantly improving its ability to pay its debt (see figure 6).

Figure 6 – Net Debt/ EBITDA Ratio Evolution



Source: EDP

Looking at other ratios, a decrease in the dependence on debt to finance assets can be seen through the debt ratio, falling from 45.30% to 37.92% in 2020. The lower this ratio, the less leveraged the company is, which implies a lower financial risk.

The interest coverage ratio reflects the ability of the company to pay the interests linked to its outstanding debt, when this is ratio is 1.5 or less, the company's ability to pay interest expenses becomes questionable considering that unforeseen financial difficulties may arise. The ratio went from 1.38 in 2015 to 2.46 in 2020, demonstrating that the company can easily pay its interest expenses.

The Equity Ratio measures the percentage of assets financed by equity, a ratio below 50% means that the company uses primarily debt to acquire assets, which indicates a higher financial risk. In 2020, EDP presented an equity ratio of 30.45% which denotes that still relies on debt rather than equity. It is important to note that each rating agency uses a different method to calculate financial ratios (see Table IV).

Table IV – Financial Ratios

	2015	2016	2017	2018	2019	2020
Debt Ratio	45,30%	40,89%	40,21%	38,64%	39,12%	37,92%
Net Debt/EBITDA	4,43	4,24	3,48	4,06	3,71	3,10
FFO/Debt	9,75%	10,42%	16,15%	13,72%	14,77%	16,85%
Interest Coverage	1,38	1,26	1,86	1,57	1,76	2,46
Equity Ratio	28,50%	31,16%	32,04%	30,99%	29,82%	30,45%

Source: EDP

An improvement in operational efficiency has been observed, considering that Revenues have fallen between 2015 and 2020 and EBITDA has remained constant (see Table V).

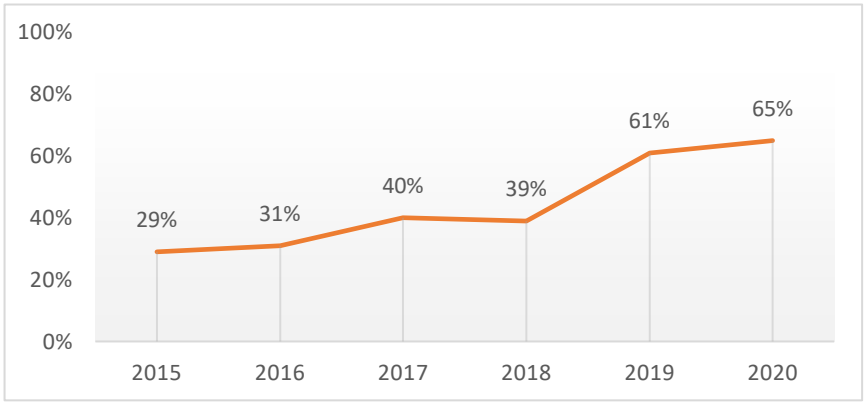
Table V – Financial Data, in mln €

	2015	2016	2017	2018	2019	2020
Revenues	15 517	14 595	15 745	15 278	14 333	12 448
Gross Profit	5 455	5 738	5 391	5 099	5 217	5 092
EBITDA	3 924	3 759	3 990	3 317	3 731	3 950
Net Profit	1 247	1 200	1 441	876	899	1 161
Debt	19 271	18 027	16 918	16 085	16 572	16 287
Net Debt	17 380	15 923	13 902	13 480	13 827	12 243
Cash	1 246	1 521	2 400	1 803	1 543	2 954
CAPEX	1 778	2 078	1 725	2 031	2 255	2 909
FFO	1 879	1 879	2 732	2 207	2 447	2 744
Assets	42 537	44 084	42 075	41 627	42 362	42 947
Equity	12 122	13 736	13 480	12 900	12 632	13 078
Liabilities	30 416	30 347	28 595	28 727	29 729	29 868

Source: EDP

Also, the percentage of EBITDA coming from renewables has been growing exponentially, from 29% in 2015 to 65% in 2020 (see Figure 7).

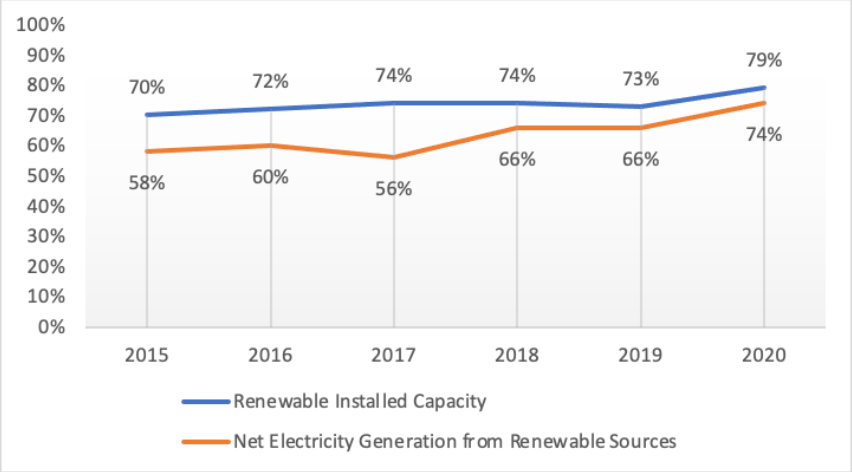
Figure 7 – Share of Renewables in EBITDA



Source: EDP

Regarding operational ratios, we can see that CO2 emissions went from 340 T/Gwh to 146 T/Gwh in 2020 (see Figure 11), which can be justified by the increase in the percentages of renewable installed capacity and net electricity generation from renewable sources (see Figure 8). The increase in these ratios reflects EDP's efforts to replace environmentally damaging sources such as oil and coal with renewable sources such as wind and sun and therefore help increase the planet's sustainability.

Figure 8 – Operational Data about Renewable Sources

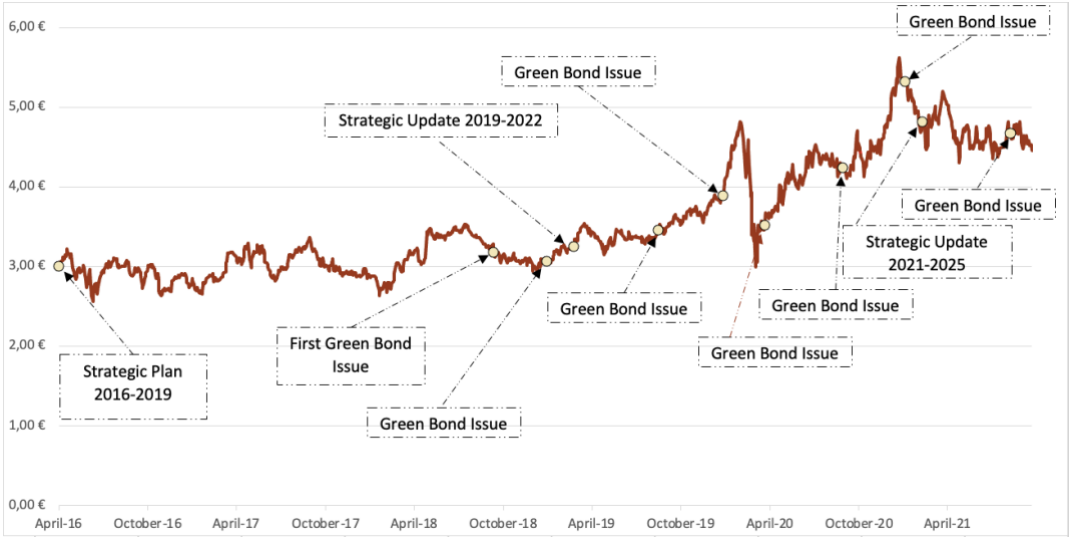


Source: EDP

Eligible Green projects comprises renewable energy production projects such as wind power plants (onshore and offshore) and solar power plants (photovoltaic), on the other hand, excludes any project based on fossil fuel and hydro energy.

Since 20 April 2016, when the strategic plan for the period between 2016 and 2019 was presented, the value of EDP and EDPR shares has been increasing. The value of EDP and EDPR shares on 18 April 2016 were at €2.97 and €7.14, respectively. As of today, EDP and EDPR shares are at €4.46 and €20.52, respectively. Regarding the value of EDP shares, there has been an increase of 50.27% from the day of the presentation to the present day (see Figure 9).

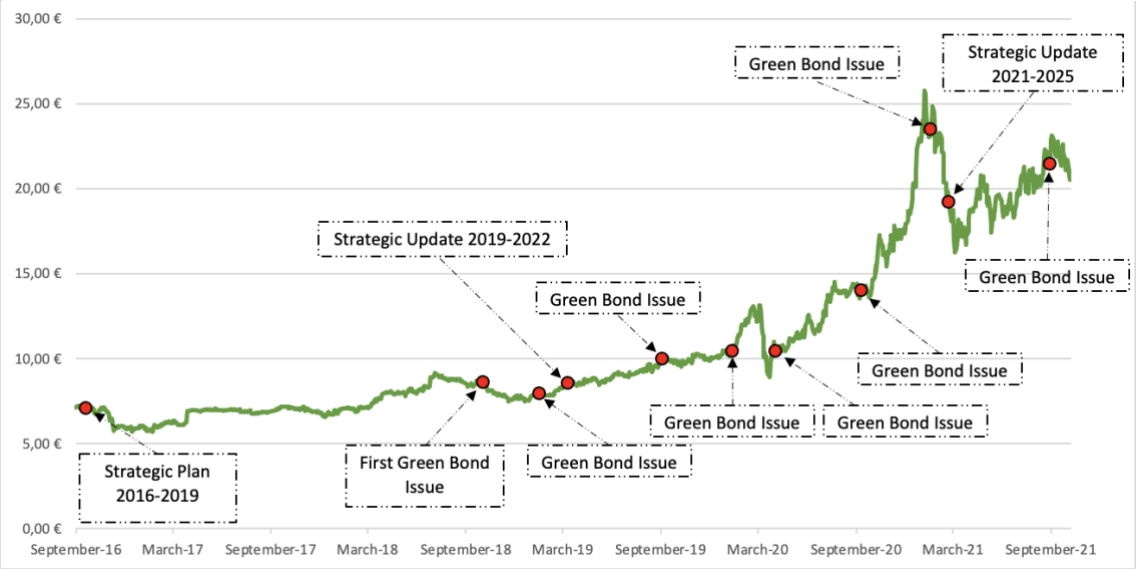
Figure 9 – EDP Share Price Evolution



Source: Yahoo Finance

This increase is more notable in the case of EDP Renováveis, a company linked to sustainability goals, with an increase of 180.40% (see Figure 10). These increases demonstrate that investors believe in the growth and sustainability goals set by the EDP in 2016.

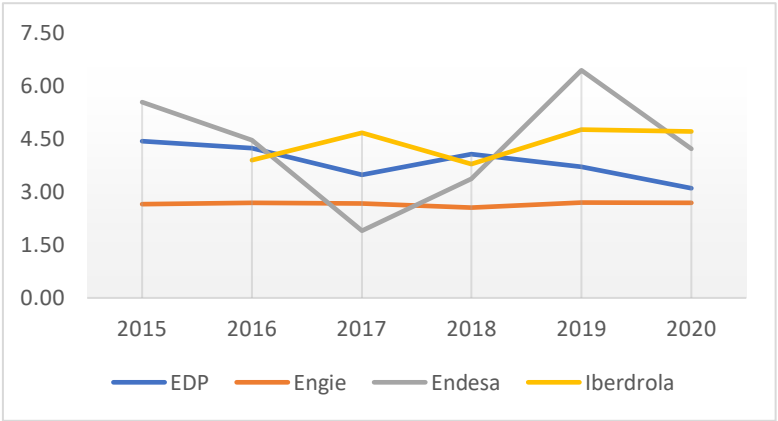
Figure 10 – EDPR Share Price Evolution



Source: Yahoo Finance

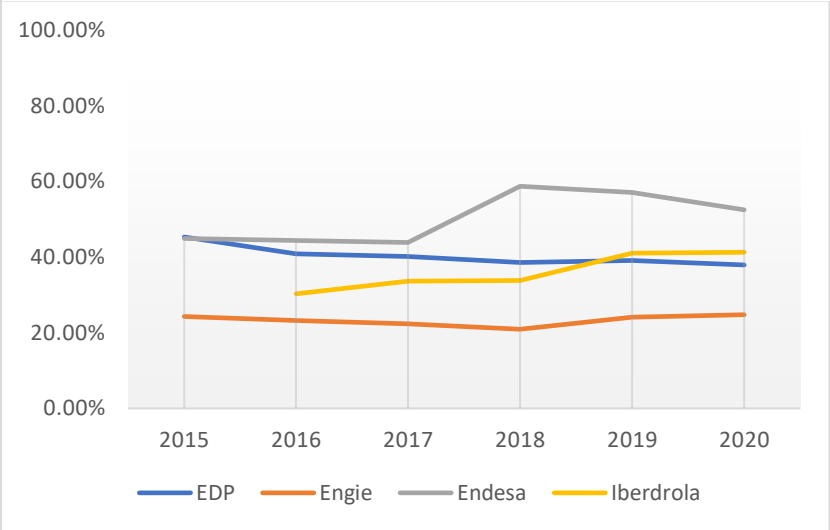
When comparing the two most important ratios, regarding credit ratings (Net Debt-to-EBITDA and Debt Rating), of 4 major utilities (Engie, Iberdrola, Endesa, EDP) it is possible to verify that in recent years EDP has been getting closer to Engie and gaining prominence over the other two, standing in 2020 with better debt ratios than Iberdrola and Endesa (see figures 11 and 12).

Figure 11 – Net Debt-to-EBITDA Comparison



Source: EDP, Engie, Endesa and Iberdrola Annual Reports

Figure 12 – Debt Ratio Comparison



Source: EDP, Engie, Endesa and Iberdrola Annual Reports

4. CONCLUSION

EDP believes that sustainable financing and green bonds, in particular, are an important instrument to stimulate the transition to a low carbon economy, providing financial support to eligible green projects in order to achieve this transition and diversifies and expands the investor base, allowing access to investors more focused on sustainability issues and thus increasing market awareness of these environmental problems.

From the data analysis, it is clear that with the issue of green bonds, EDP was able to improve its financial and operational ratios and accelerate the transition to a zero carbon economy by increasing the weight of renewable energies in the group's activity. In fact, EDP managed to reach the objectives set out in its strategic plan, which consisted of improving its financial ratios with the aim of upgrading its credit rating and achieving the transition to a low-carbon energy through investment in renewable energies rather than sources that are harmful to the environment.

Thus, Green Bonds are suitable for projects with a long-term investment horizon, large investment amounts and secured income streams, such as renewable energy infrastructure, since green bonds can provide access to long-term debt at a relatively low cost of capital. These characteristics match EDP's funding needs to accelerate renewable growth, seeking to double their installed capacity in wind and solar until 2025 (adding 4 GW per year), reinforcing EDP´s position as a leader in the energy transition.

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APPENDICES

Figure 13 – Operational Data

	2015	2016	2017	2018	2019	2020
Installed Capacity (MW)	24,364	25,223	26,753	27,151	26,681	23,680
Renewable Installed Capacity	70%	72%	74%	74%	73%	79%
Net Electricity Generation (GWH)	63,706	70,011	70,000	71,963	66,670	64,318
Net Electricity Generation from Renewable Sources	58%	60%	56%	66%	66%	74%
Electricity Distributed (GWH)	79,159	78,214	78,788	80,246	79,519	76,123
Gas Supplied (GWH)	31,717	23,827	18,904	18,997	19,389	17,070
Electricity Customers (in mln)	9,712	9,806	9,886	9,848	9,828	8,615
Gas Customers (in mln)	1,405	1,498	1,585	1,595	1,599	0,691
Specific CO2 Emissions (T/GWH)	340	271	334	257	216	146
Employees	12 084	12 017	11 657	11 631	11 660	12 180

Source: EDP

Figure 14 - Financial Data Engie

In Million €

Engie	2015	2016	2017	2018	2019	2020
EBITDA	11 274	10 089	9 200	9 200	10 400	9 300
Debt	39 155	36 950	33 467	32 179	38 545	37 938
Cash	9 183	9 825	8 929	8 700	10 519	12 980
Assets	160 658	158 499	150 141	153 702	159 793	153 182
Net Debt	29 972	27 125	24 538	23 479	28 026	24 958

Source: Engie

Figure 15 - Financial Data Endesa

In Million €

Endesa	2015	2016	2017	2018	2019	2020
EBITDA	1 247	1 525	3 542	3 627	1 795	2 452
Debt	6 918	6 822	6 754	12 232	11 579	10 462
Cash	12	21	30	13	31	130
Assets	15 423	15 379	15 400	20 837	20 306	19 950
Net Debt	6 906	6 801	6 724	12 219	11 548	10 332

Source: Endesa

Figure 16 – Financial Data Iberdrola

In Million €

Iberdrola	2015	2016	2017	2018	2019	2020
EBITDA	-	7 934	7 319	9 349	10 104	10 010
Debt	-	32 331	37 295	38 162	50 173	50 566
Cash	-	1 433	3 197	2 801	2 113	3 427
Assets	-	106 706	110 689	113 038	122 369	122 518
Net Debt	-	30 898	34 098	35 361	48 060	47 139

Source: Iberdrola