OMEGA geração SA Valuation: study applied to a company with renewable electricity assets

Avaliação da OMEGA Geração SA: estudo aplicado a uma empresa com ativos de eletricidade renovável

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ABSTRACT
This work aims to evaluate the value of the operating assets of generation of the company Omega Geração S.A., listed on the Brazilian stock exchange (B3), under the code OMGE3. In which, to carry out the calculation of the equity value, business analysis tools through asset Valuation (specifically the discounted cash flow approach) were used. In order to carry out the Valuation model of the assets under study, the financial statements for the years 2016 to 2020 were used to make assumptions for the projection model. With the assumptions defined, the company's cash flows were projected for 30 years, and after that period a terminal value with no real growth was adopted. Then, future cash flows were discounted to present value by a discount rate. Modeling limitations have been fixed using information from companies' sector that have similar assets. After the cash flow projections, and using the assumptions adopted, the equity value for the company's operating generation assets is R$ 3,050 million. Some sensitivity simulations were carried out on the equity value. The assumptions used in the sensitivity matrix were: growth rate, cost of capital (discount rate), energy price in the spot market and cost of sales. The sensitivity matrix of the assumptions allowed the creation of a range of values for the company's equity.

Keywords: Valuation, Discounted Cash Flow, Equity Value, OMEGA Geração SA.

RESUMO
Este trabalho tem como objetivo avaliar o valor dos ativos operacionais de geração da empresa Omega Geração S.A., listada na bolsa de valores brasileira (B3), sob o código OMGE3. No qual, para realizar o cálculo do valor do patrimônio líquido, foram utilizadas ferramentas de análise de negócios por meio de Valuation de ativos (especificamente a abordagem do fluxo de caixa descontado). Para a realização do modelo de Valuation dos ativos em estudo, foram utilizadas as demonstrações financeiras dos anos de 2016 a 2020 para a definição de premissas para o modelo de projeção. Com as premissas definidas, os fluxos de caixa da empresa foram projetados para 30 anos e, após esse período, foi adotado um valor terminal sem crescimento real. Em seguida, os fluxos de caixa futuros foram descontados ao valor presente por uma taxa de desconto. As limitações da modelagem foram corrigidas com o uso de informações do setor de empresas que possuem ativos semelhantes. Após as projeções de fluxo de caixa, e utilizando as premissas adotadas, o valor do patrimônio líquido para os ativos de geração operacional da empresa é de R$ 3.050 milhões. Foram realizadas algumas simulações de sensibilidade sobre o valor do patrimônio líquido. As premissas utilizadas na matriz de sensibilidade foram: taxa de crescimento, custo de capital (taxa de desconto), preço da energia no mercado spot e custo de vendas. A matriz de sensibilidade das premissas permitiu a criação de uma faixa de valores para o patrimônio líquido da empresa.

Palavras-chave: Avaliação, fluxo de caixa descontado, valor do patrimônio líquido, OMEGA Geração SA.

1 INTRODUCTION

The fair value of an asset is a very important metric for making a financial decision (Assaf Neto, 2014). The way to find the fair value of an asset is doing its valuation. In general terms, there are a lot of approaches to valuation assets, in which, these approaches need assumptions in their models to bring a result, and to find fair assumptions the analyst needs to have some previous knowledge about the asset that will be analyzed.

According to Damodaran (2012), the valuation is built in a quantitative process, but the inputs depend on subjective judgments. Thus, the final value that the model predicts is colored by the bias that the anal bring into the process.

The objective of this study is to determine the equity value of the operational generating assets of a power generating company applying knowledge of the power sector and financial concepts. OMEGA Geração S.A. (OMEGA Geração) is the company that will be analyzed. The company is one of the few companies listed on the Brazilian stock exchange that has only renewable electricity assets, and this was the reason for choosing this company. To find the company's equity value, the present study aims to use valuation techniques, specifically, the discounted cash flow (DCF) as main approach. In addition, this study will evaluate the power generator operational assets of the company, since OMEGA Geração hold other companies, as such two trading companies.

To model the assets' future cash flows, assumptions were made based on the company's past performance, using data from the financial statements provided by the company on its Investor Relations website. The period used to create the assumptions was from 2016 to 2020. Projections were made for the

next 30 years, as the company has 30-year long-term contracts, and after 2050, it was calculated a terminal value using growth in perpetuity approach. Afterwards, the premise was adopted that the company would not have real growth in the coming years. Finally, the discount rate was calculated to bring all projected cash flows to present value and then determine the company's equity value.

The result of this work should be the value of the company's operating power- generating assets, not the company as a whole. That said, the company's equity value found cannot be compared with the market value traded on the Brazil stock exchange, as the market prices other items not covered in this work, such as the future projects that the company is developing.

Since the company is publicly traded, and it needs to keep certain information confidential, the process of evaluating the company's power generator operational assets bring some limitations in the valuation model, since the company only reports its financial statements consolidate, which this limitation of information can be an issue to create assumptions about the business.

The bills payable and bills receivable was adjusted to zero and considered null over the projected years. This approach creates a limitation. However, it is not a material change as most revenues come from long-term contracts.

2 LITERATURE REVIEW

2.1 VALUATION

Asset valuation is the process of determining the fair value of a company's assets. There are many methods for valuing an asset, however the approach that was used in this study is Discounted Cash Flow.

2.2 DISCOUNTED CASH FLOW (DCF)

For Damodaran (2012), Discounted cash flow (DCF) valuation relates the value of an asset to the present value (PV) of expected future cash flows on that asset. As shown in the equation below, this approach estimates the intrinsic value of an asset discounting its future cash flow for a rate. In this study, the discount rate will be the Weighted Average Cost of Capital (WACC).

$$DCF = \sum_{i=1}^{t=n} \frac{CF_t}{(1+r)^t} \quad (2.1)$$

Where,

n = Life of the asset; CFt = Cash flow in period t; and r = Discount rate reflecting the riskiness of the estimated cash flows.

2.2.1 Terminal Value

The terminal value (TV) is the estimated value of the company beyond the explicit projected period. For this study, the perpetuity growth model will be used to calculate the terminal value (DAMODARAN, 2012).

$$TV_{perpetuity} = \frac{{}^{CF_n(1+g)}/_{(r-g)}}{(1+r)^n} \quad (2.2)$$

2.3 WEIGHTED AVERAGE COST OF CAPITAL (WACC)

WACC is used as an "opportunity cost" of the capital invested in the company or asset; it is considered the minimal return expected from the investment. The company creates value if its return exceeds the cost of capital (ASSAF NETO, 2014).

$$WACC = K_e \frac{Equity}{(Equity+Debt)} + K_d \frac{Debt}{(Equity+Debt)}(1-T) \quad (2.3)$$

Where,
Ke = Cost of Equity; Kd = Cost of Debt; Equity = Shareholder's equity; Debt = Book value of debt; and T = Taxation.

2.4 COST OF DEBT (KD)

The Cost of Debt (Kd) is the cost that a company pays to borrow money (ASSAF NETO, 2014). A company's cost of debt reflects its credit profile, which is based on various factors as size, sector, cyclicality, credit ratings, cash flow generation, finance policy and others. (ROSENBAUM; PEARL, 2020)

For publicly traded debentures/bonds, cost of debt is determined by the current yield on all outstanding issues, and for debts that are not traded, an approach is to calculate the company's weighted average cost of debt using the annual interest rate reported (ROSENBAUM; PEARL, 2020).

2.5 COST OF EQUITY (KE*)*

The cost of equity is the annual rate of return expected for investor in some company or asset. To calculate the expected return rate, we will use the CAPM – Capital Asset Pricing Model. The CAPM is based on three inputs: Risk-free rate, Expected return on market portfolio and Beta of asset (DAMODARAN, 2012, Pg. 68).

$$E(R_i) = R_f + \beta_i[E(R_m) - R_f] \quad (2.4)$$

Where,

E(Ri) = Expected return on asset i; Rf = Risk-free rate; E(Rm) = Expected return on market portfolio; and βi = Beta of asset i.

2.5.1 Risk-Free Rate

Risk and return models in finance start off with an asset that is defined as risk free. The risk-free rate is a remuneration offered by an asset without default and reinvestment risk. For Damodaran, the only securities that have a chance of being risk free are government securities, and to have no risk reinvestment it needs to have no coupon payments (DAMODARAN, 2012).

2.5.2 Risk Premium

Risk premium is the rate that investors are expecting to have investing in an asset with more risks than the asset without risks, which "Rm" is the expected market return and can be me measured using historical data – Average of past 10 years (ASSAF NETO, 2014).

2.5.3 Beta coefficient

The Beta coefficient measures the company´s risk regarding market's systematic risk. In other words, the Beta is the angular coefficient of the linear regression between market portfolio's return and company's return (for companies traded on stock market). However, according to Assaf Neto (2014, Pg. 74) there are 3 possible cases for the beta, such as:

if the Beta is less than 1: The company's risk is lower than the market portfolio;

If the Beta is equal 1: The company's risk is equal to the market portfolio; and

if the Beta is greater than 1: The company's risk is greater than the market portfolio.

3 INDUSTRY OVERVIEW

The power sector in Brazil is the largest in Latin America and the seventh in the world. As shown in table 1, at the end of 2020, Brazil's installed generation capacity was 174.7GW with a good diversification across regions (CAPACIDADE INSTALADA, 2021).

Table 1 – Brazil's installed capacity by region and state 2020 (MW)

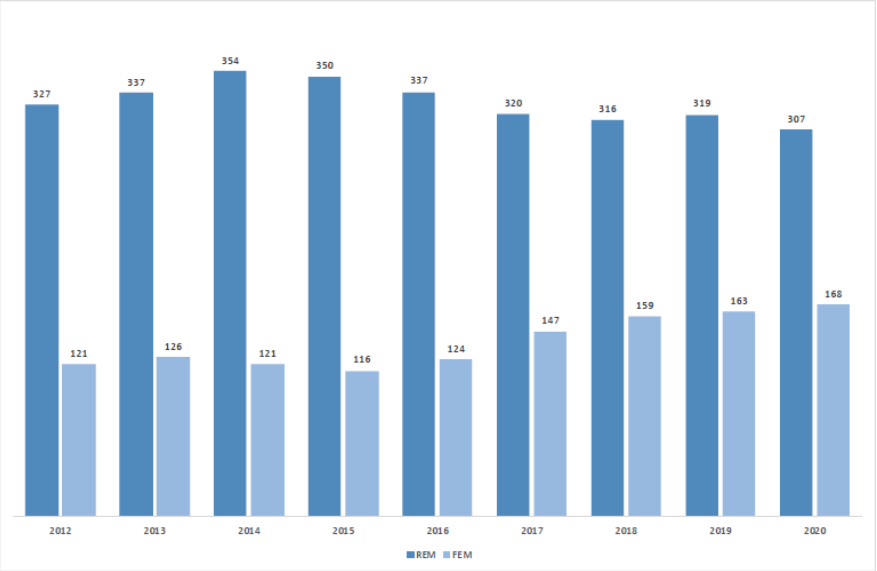
	MW	Participation (%)
Brazil	**174.737**	**100,0**
North	**34.855**	**19,9**
Rondônia	8.34	4,8
Acre	68	0,0
Amazonas	2.338	1,3
Roraima	345	0,2
Pará	20.487	11,7
Amapá	795	0,5
Tocantins	2.482	1,4
Northeast	**40.401**	**23,1**
Maranhão	3.573	2,0
Piauí	3.263	1,9
Ceará	4.579	2,6
Rio Grande do Norte	5.415	3,1
Paraíba	909	0,5
Pernambuco	3.567	2,0
Alagoas	4.051	2,3
Sergipe	3.223	1,8
Bahia	11.82	6,8
Southeast	**46.44**	**26,6**
São Paulo	20.272	11,6
Minas Gerais	15.724	9,0
Espírito Santo	1.61	0,9
Rio de Janeiro	8.833	5,1
South	**32.485**	**18,6**
Paraná	18.178	10,4
Santa Catarina	5.724	3,3
Rio Grande do Sul	8.583	4,9
Midwest	**20.556**	**11,8**
Mato Grosso do Sul	5.869	3,4
Mato Grosso	6.356	3,6
Goiás	8.294	4,7
Distrito Federal	38	0,0

Source: MME (2021, Pg. 59)

This diversification between regions is possible in view of the fact that Brazil is a big country that has many of possibilities to generate electricity energy from diverse sources. In 2018, Brazil was the third largest renewable energy generator in the world, just behind China and United States of America (MME, 2021)

In Brazil, electricity is commercialized in two markets: the regulated electricity market (REM), in which generators and distributors have bilateral contracts via government auctions, and the free electricity market (FEM), in which the consumers purchase energy directly from generators. However, to have the option of operating in the free electricity market, each consumer unit must present a minimum contracted demand of 1,500 kW. In addition, the free electricity market opened a new segment in the sector, the trading companies, that are the intermediate between generators and consumers. Figure 1 below shows the growth of the free electricity market over the years compared to the regulated electricity market.

Figure 1 – Total regulated and non regulated consumption (TWh)



Source: MME (2021, Anuário Estatístico de Energia Elétrica, Pg. 92-93)

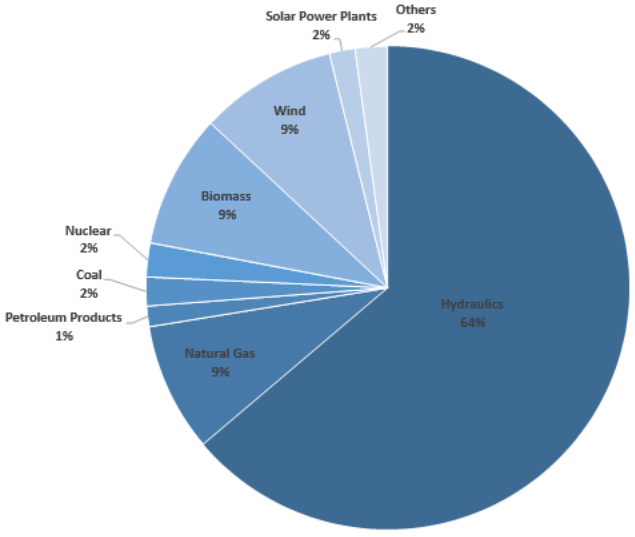
The Brazilian power sector is split into three main parts:

- Generation: Converts energy in electricity from different sources;
- Transmission: Provides the lines to transmit the energy between the power plants and distribution companies; and
- Distribution: Responsible to deliver the energy for costumers.

3.1 GENERATION SECTOR

The Brazilian power plants are structured as following the sources: Renewable (Hydro, Biomass, Wind and Solar), Nuclear, Natural Gas, Coal and Petroleum Products. Figure 2 below shows the composition of the Brazilian energy matrix.

Figure 2 – Brazil electricity generation by source



Source: MME (2021, Anuário Estatístico de Energia Elétrica, Pg. 63)

Most of the energy produced in Brazil comes from renewable sources, in which, the power system is backed up by thermal power plants during the country's rainy droughts.

3.1.1 Physical Guarantee

The physical guarantee of a power plant is associated with long-term conditions that each company can provide of energy to the power system. The power plant's physical guarantee is used to define the maximum of energy that a power plant can sell. Therefore, the generators companies are not allowed to sell all the energy that they can generate, thus limited by its physical guarantee for long-terms contract (FERNANDES, 2018).

3.1.2 Energy Reallocation Mechanism (ERM)

The hydroelectric plants are controlled by the ONS, that is, if a region has a hydrological problem, the hydroelectric plants in that region will not be able to operate.

Therefore, the company that cannot generate energy will have to buy the energy on the spot market (which is generally more expensive) to comply with the contracts.

ERM was created to mitigate the hydrological risk that hydropower generators can have, protecting them from expensive price of energy on spot market. It works as a club of hydropower plants, in which EMS reallocates the total generated energy in a period among the hydropower plants.

All hydropower plants that are dispatched centrally by the Operador Nacional Do Sistema Eletrico (ONS) need to participate on the EMS system. However, the Small hydropower plants can choose if they want to participate or not (FERNANDES, 2018).

3.1.3 Generations Scaling Factor (GSF)

As already mentioned in physical guarantee topic, the companies are limited to sell their energy by physical guarantee. The generation scaling factor is the ratio between the total generation and the total physical guarantee of the all-hydropower plants that participating in the Energy Reallocation Mechanism (ERM).

$$GSF=G/PG \qquad (3.1)$$

Where, G is the generated energy and PG is the physical guarantee in the ERM. The GSF ratio can be interpreted as demonstrated below:

GSF > 1: it means that hydropower plants produced more than their physical guarantee;

GSF = 1: it means that hydropower plants produced the expected from their physical guarantee. In other words, if the companies sold 100% of their physical guarantee, they will be able to comply the contracts; or

GSF < 1: it means that hydropower plants produced less than their physical guarantee and they probably will need to buy energy on spot market.

However, the companies have the option of not selling 100% of their guarantee. It is a way to mitigate some risk of GSF below 1.

3.2 TRANSMISSION SECTOR

The transmission sector is responsible to connect generators and distributors throughout the country. The sector is fully regulated and has public and private companies providing services via concessions.

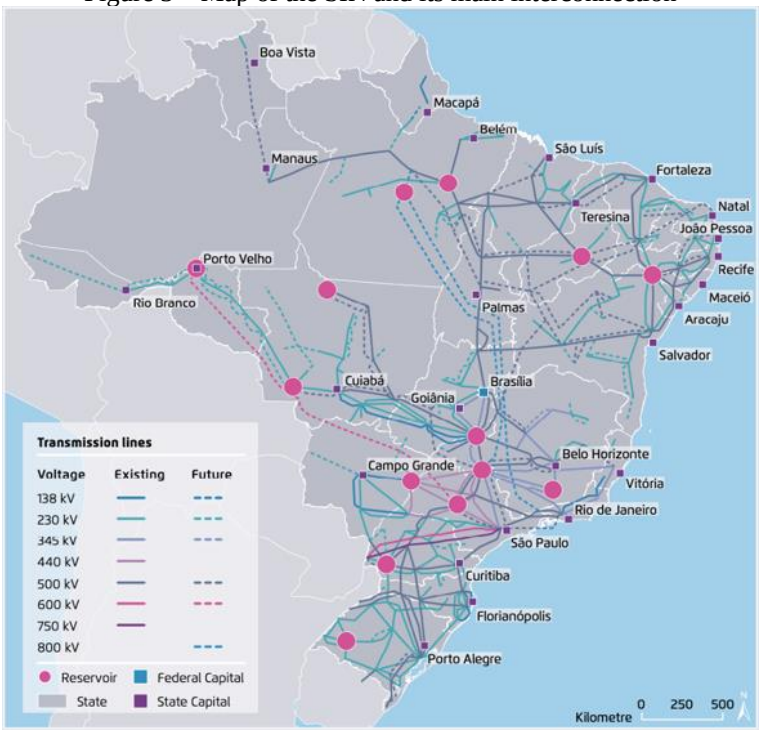
The transmission lines concessions are offered by the ANEEL on long-term contracts of 30-years through public auctions. ANEEL issues a proposal with a maximum RAP per concession, and the company that offer the lowest RAP wins the concession.

The RAP is the maximum revenue that a company can have in any concession, which is usually adjusted every year by inflation. In other words, it does not matter how much energy will be transported throughout the lines, but the availability of the lines to be used.

In other perspective, ANEEL is grating a concession to the transmission company to build and manage the lines. When the lines come into operation, ANEEL will pay the RAP.

Brazil has a large transmission grid that is organized in 4 subsystems management by National Interconnected System (SIN). The subsystems are: South (S), Southeast/Centre- West (SE/CO), Northeast (NE). The SIN is operated by ONS and regulated by the ANEEL. Figure 3 shows the distribution of transmission lines across the Brazilian territory.

Figure 3 – Map of the SIN and its main interconnection



Source: Griebenow (2019, Agora Energiewende Instituto E+ Diálogos Energéticos, Pg. 12)

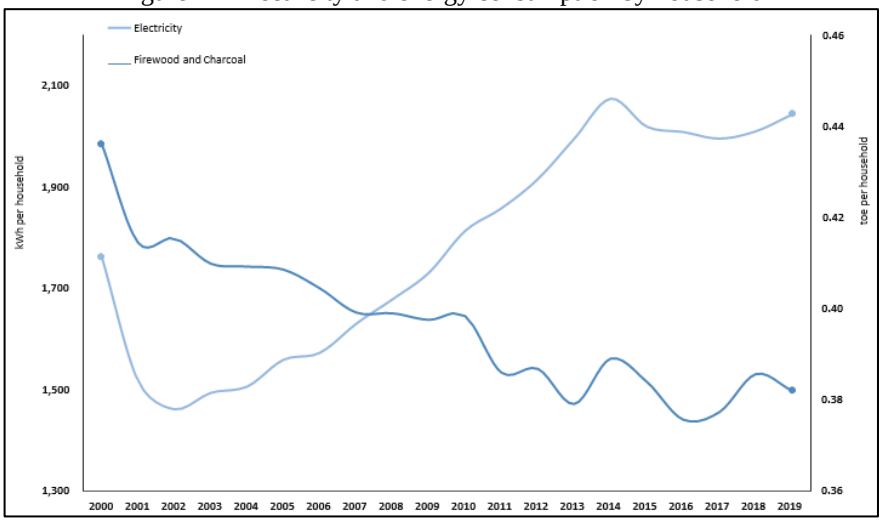
3.3 DISTRIBUTION SECTOR

The distribution sector is responsible to convert the energy to a lower voltage and transportation to the end consumer. The sector is also regulated by ANEEL, which determinates the tariffs that the end consumer must pay.

Electricity tariffs are adjusted separately for each distribution company, when the cost of purchasing energy from generators, transportation losses and sector changes are considered. The tariffs are adjusted in three regular periods: the annual adjustment, the periodic tariff review (which is updated on average each 4 years) and the extraordinary tariff revisions (when necessary).

As shown in Figure 4, the demand for electricity in Brazil increased 15.9% in the period of 2000 to 2019 due the economic growth of the country and the advance of governmental stimulus to move families from rural area to cities (MME, 2020).

Figure 4 – Electricity and energy consumption by household

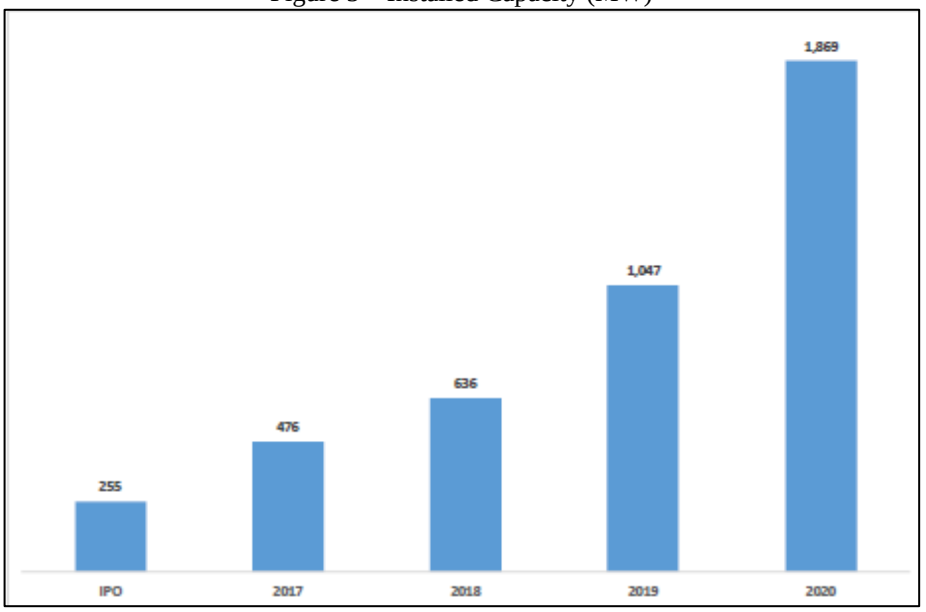


Source: MME (2020, Atlas of Energy Efficiency Brazil, Pg. 22)

4 COMPANY OVERVIEW

Omega Geração SA (Company) is a holding that have generations assets of electrical energy from renewable sources (Wind, Solar and Hydro). The Company started its activities in 2008 with the proposal to purchase renewable power plants and throughout the years the company made several acquisitions of operational power plants, in which, this process was accelerated after its initial public offering (IPO) in 2017, where the Company grew its capacity (MW) more than seven times in four years, as shown in figure 5. In the end of 2020, the company reached 1,869 MW of installed capacity from 100% of renewable sources. Omega Geração is the fastest growing energy company listed on Brazilian stock market (B3), growing seven times in four years.

Figure 5 – Installed Capacity (MW)



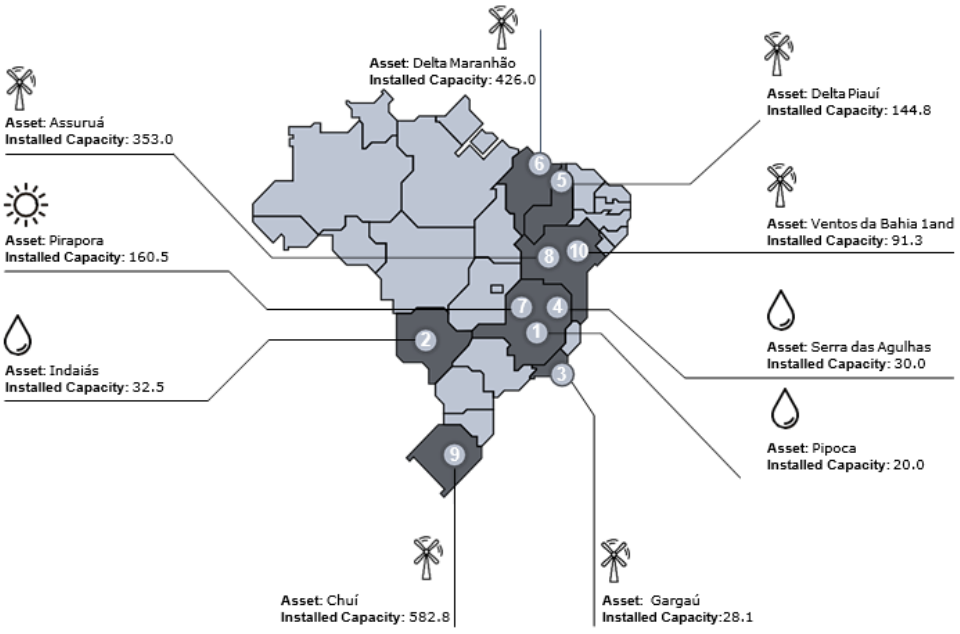
Source: Investor Relations - Omega Geração (2021)

The company reported new deals with development partners that can multiply by 1.4 times its current installed capacity in the following years. However, in this study those new power plants will not be considered.

4.1 ASSET PORTFOLIO

The Company has an installed portfolio of 1,869 MW including wind, hydro and solar operational assets located in 7 Brazilian states: Maranhão, Piauí, Bahia, Mato Grosso do Sul, Minas Gerais, Rio de Janeiro and Rio Grande do Sul. Figure 6 shows the assets across the Brazilian territory.

Figure 6 – Asset Portfolio in MW - Brazilian Map



Source: Investor Relations - Omega Geração (2021)

The company is present from north to south, in all energy submarkets, combining geographic diversification. Furthermore, the company holds the first offer for Omega Desenvolvimento portfolio assets, which comprises 1.8 GW of installed capacity. Omega Desenvolvimento is a company that builds new power plant assets from renewable sources; this company is not under Omega Geração SA management and will not be evaluated.

Besides the power plants assets, Omega Geração SA holds two energy trading companies (Omega Comercializadora de Energia Ltda and Omega Geração Comercial- izadora de Energia Ltda.), in which these companies carry out market monitoring and analysis, contributing to energy planning, management of production and contracts for the Company's assets.

4.2 GROWTH STRATEGY

The Company's strategy to create value and growth is to continually expand its operations through the acquisition of operating assets that increase returns and decrease the cost of capital.

The company pursues acquisition opportunities with returns above its cost of capital and that effectively the diversify company's asset base, reducing exposure to asset's specific risks. As company's strategy, its focus is on assets presenting high technical standards, operating longevity long term inflation by indexed purchase power agreements (PPAs) and adequate scale with stable operating cost, resulting in stable and predictable cash flows.

4.3 FINANCIAL STATEMENTS

The company's financial statements state the last 5 years (2016 to 2020) grouping the main accounts for its business. The balance sheet is shown in table 2, income statement in table 4 and cash flow statement 5.

Table 2 – Balance Sheet (2016-2020) - Omega Geração S.A.

Balance Sheet (R$MM)	**2016A**	**2017A**	**2018A**	**2019A**	**2020A**
Cash and marketable securities	38.19	350.89	195.40	984.47	881.36
Accounts receivable	47.49	209.71	179.00	206.93	276.31
Inventory	0.00	0.00	0.00	0.00	0.00
Total other current assets	16.29	36.17	50.10	85.48	158.48
Current assets	**101.97**	**596.77**	**424.50**	**1,276.88**	**1,316.15**
Net tangible fixed assets	584.78	2,735.29	2,648.20	4,516.42	6,599.68
Total financial assets	58.28	113.49	593.00	614.28	1,283.03
Net goodwill	0.00	0.00	0.00	0.00	0.00
Total other non current assets	28.57	460.23	439.40	854.89	1,379.48
Non current assets	671.63	3,309.01	3,680.60	5,985.59	9,262.20
Total assets	**773.61**	**3,905.77**	**4,105.10**	**7,262.47**	**10,578.35**
Accounts payable	27.48	95.17	67.01	69.19	84.82
Short-term debt	34.35	135.48	107.87	193.67	373.86
Total other current liabilities	39.60	88.45	36.68	71.97	149.65

Current liabilities	101.43	319.10	211.56	334.82	608.33
Long-term debt	281.95	1,747.25	2,001.14	3,757.22	5,522.99
Total other non-current liabilities	20.48	28.91	36.96	308.77	601.99
Total provisions	0.00	0.00	0.00	0.00	0.00
Non current liabilities	302.43	1,776.16	2,038.10	4,065.99	6,124.98
Total liabilities	**403.86**	**2,095.26**	**2,249.66**	**4,400.81**	**6,733.31**
Minority interest - accumulated	74.21	50.34	43.58	45.15	111.87
Shareholders' equity	295.53	1,760.18	1,811.87	2,816.51	3,733.16
Shareholders' funds	369.75	1,810.52	1,855.44	2,861.66	3,845.03
Liabilities and shareholders' funds	**773.61**	**3,905.77**	**4,105.10**	**7,262.47**	**10,578.35**

Source: Elaborated by the author

In the end of 2020, the current assets represent 12% of the total assets. It is an expected value for the company's business, since generator companies do not have inventory.

The "Net tangible fixed assets" is the biggest account in the company's assets, which in 2020 represented 62% of its assets. This account is measured at historical acquisition or construction cost, minus accumulated depreciation.

OMEGA is an early-stage company, which means that the company is increasing its assets by raising funding from banks and investors. In 2020, the company had 64% of its capital from third party (banks and bonds issued), and 36% from its shareholders.

As said before, the company only buys operational assets and this fact helps the company keeps its leverage (Net Debt/EBITDA) in an acceptable level.

On 12/31/2020, the company reported around R$ 5,897 millions of gross debt, in which that debts are broken down in debentures (local bonds), loan from development banks and loan from private banks as shown in the following table, as shown in table 3.

Table 3 – Debts - Omega Geração S.A.

Debts	Ticker	Financial Institution	Maturity	Payment	Debt cost (p.a.)		R$ (mm)	%
Indaiás	-	CCB	7/1/25	monthly	CDI	2.90%	70.3	1.17%
Gargaú	-	BNDES	5/1/27	monthly	TJLP	2.23%	28.5	0.48%
Delta 1	-	BNDES	10/1/30	monthly	TJLP	2.18%	148.8	2.48%
Serra das Agulhas	-	BNDES	7/1/37	monthly	TJLP	2.02%	101.3	1.69%
Delta 2	-	BNDES	1/1/33	monthly	TJLP	2.27%	254.8	4.25%
Delta 2	PTMI11	Debentures	12/1/26	semi annually	IPCA	7.38%	31.8	0.53%
Delta 3	-	BNDES	3/1/34	monthly	TJLP	2.32%	921.8	15.39%
Delta 3	OMNG12	Debentures	12/1/29	semi annually	IPCA	7.11%	199.5	3.33%
Delta 5	-	BNB	5/1/38	monthly	IPCA	1.75%	163.6	2.73%
Delta 6	-	BNB	5/1/38	monthly	IPCA	1.75%	165.7	2.77%
Delta 7	-	BNB	1/1/39	monthly	IPCA	2.19%	204.8	3.42%
Delta 8	-	BNB	1/1/39	monthly	IPCA	2.19%	109.8	1.83%
Omega Geração	OMGE11	Debentures	5/1/24	semi annually	CDI	1.20%	309.8	5.17%
Omega Geração	OMGE21	Debentures	5/1/26	semi annually	CDI	1.30%	168.7	2.82%
Omega Geração	OMGE31	Debentures	5/1/26	annually	IPCA	5.60%	201.2	3.36%

Omega Geração	OMGE41	Debentures	5/1/27	semi annually	IPCA	5.00%	160.0	2.67%
Omega Geração	OMGE12	Debentures	9/1/28	semi annually	IPCA	4.37%	114.8	1.92%
Omega Geração	OMGE22	Debentures	9/1/28	annually	IPCA	4.37%	52.2	0.87%
Assuruá 1	-	BNDES/CEF	11/1/32	monthly	TJLP	2.92%	135.8	2.27%
Assuruá 1	SSRU11	Debentures	11/1/30	monthly	IPCA	7.81%	36.1	0.60%
Assuruá 2	-	BNDES	6/1/34	monthly	TJLP	2.75%	706.2	11.79%
Assuruá 2	CEAD11	Debentures	6/1/30	monthly	IPCA	6.66%	156.9	2.62%
Assuruá 3	-	BNB	11/1/38	monthly	IPCA	2.33%	197.2	3.29%
Santa Vitória	-	BNDES/BRDE	12/1/31	monthly	TJLP	3.76%	833.9	13.92%
Santa Vitória	SVIT11	Debentures	6/1/28	semi annually	IPCA	8.50%	99.7	1.66%
Hermenegildo	-	BNDES/BRDE	6/1/32	monthly	TJLP	4.19%	417.8	6.97%
Total						**7.85%**	**5,991.0**	**100%**

Source: Investor Relations - Omega Geração (2021)

The company's debt is linked to the following indexes: (i) TJLP: 59.24%; (ii) IPCA: 31.60%; and (iii) CDI 9.16%.

The company has long-term debts that create a distributed schedule amortization over the years. However, the companies consolidated the amortizations after 2034, and for projections matters, the remaining of debt after 2034 was distributed in equal parts over the following years.

The company's income statement is broken down in gross revenue that is provided from its power plant assets; tax of sales; net sales; cost of sales; selling, seneral and administrative expenses (SG&A); depreciation and amortization of tangible fixed assets; other operating items, that in our model is: gain from bargain purchase, impairment of assets, previously unused credits, curtailment, loss of profits, insurance claims receivable, taxes on other income and Contracts indemnity; associates that represent the result of its investments; net interest income; taxation; minority interest from assets that is not totally owned by Omega Geração; Preferred dividends; and Net income. All of these accounts listed will be modeled and explained with more detail in the next section.

Table 4 – Income Statement (2016-2020) - Omega Geração S.A.

Income Statement (R$MM)	2016A	2017A	2018A	2019A	2020A
Revenue	209.00	593.35	797.42	1,088.81	1,169.18
Tax of sales	-14.02	-47.24	-55.39	-74.38	-67.04
Net sales	**194.98**	**546.11**	**742.02**	**1,014.43**	**1,102.14**
Cost of sales	-89.60	-292.40	-321.90	-431.81	-434.33
SG&A	-10.60	-27.10	-39.90	-28.11	-40.78
Depreciation and Amortization	-29.50	-59.60	-120.30	-187.12	-263.56
Other operating items	0.00	62.20	3.90	-7.63	150.91
Associates	5.63	3.53	9.10	26.36	9.49
EBIT	**70.91**	**232.75**	**272.92**	**386.12**	**523.88**
NOPAT	**53.76**	**199.57**	**180.60**	**191.41**	**270.03**
Net interest income/expense	-35.70	-100.82	-197.40	-320.30	-417.72
Pretax profit	**35.21**	**131.92**	**75.52**	**65.82**	**106.16**
Taxation	-8.52	-18.80	-25.55	-33.19	-51.44
Minority interest	0.00	-12.74	-8.15	-5.48	-5.37
Preferred dividends	0.00	0.00	0.00	0.00	0.00
Reported net income	**26.70**	**100.38**	**41.83**	**27.15**	**49.35**

Source: Elaborated by the author

The cash flow statement is broken down in three main sections listed below:

Cash from operations: in this section the reported net income is adjusted with the non-cash expensive/profit. In this study, the Minority interest and Depreciation and amortization are added to the net income, and the other operation cash flow is removed.

Cash from investing activities: it is the cash that has been generated (or spent) on non-current assets that are intended to produce a profit in the future. As assumption of this study, the company will not buy new power plants, and in this case the only account that needs to be projected is the CAPEX.

Cash from financing activities: this section provides the cash flow from loans, dividends and other financing cash flows. The change in borrowings will follow the debt schedule shown in the Debt section.

Table 5 – Cash Flow Statement (2016-2020) - Omega Geração S.A.

Cash Flow (R$MM)	2016A	2017A	2018A	2019A	2020A
Reported net income	32.32	103.91	50.93	53.51	58.85
Preferred dividends	0.00	0.00	0.00	0.00	0.00
Minority interest	0.00	12.74	8.15	5.48	5.37
Depreciation and amortization	29.50	59.60	120.30	187.12	263.56
Total other operating cash flow	5.86	-97.86	-7.02	-26.13	-110.82
Net change in working capital	0.00	0.00	0.00	0.00	0.00
Cash from operations	**67.68**	**78.39**	**172.36**	**219.98**	**216.94**
Capital expenditure	-4.20	-212.10	-458.00	-789.64	-1,065.39
Net acquisitions/disposals	0.00	0.00	0.00	0.00	0.00
Total other investing cash flows	0.00	0.00	0.00	0.00	0.00
Cash from investing activities	**-4.20**	**-212.10**	**-458.00**	**-789.64**	**-1,065.39**
Change in borrowings	-30.97	588.65	164.17	1,277.54	883.64
Equity raised/share buybacks	0.00	0.00	0.00	0.00	0.00
Dividends paid	-21.01	-12.37	-30.24	0.00	-6.03
Total other financing cash flows	4.88	-337.86	3.27	107.57	-122.79
Cash from financing activities	**-47.10**	**238.42**	**137.20**	**1,385.11**	**754.83**
Change in cash	16.38	104.72	-148.44	815.44	-93.61
Free cash flow	63.5	(133.7)	(285.6)	(569.7)	(848.4)

Source: Elaborated by the author

5 COMPANY VALUATION

The approach used in this study was to build a model that provides free cash flow over future years. To predict the numbers in the financial statements, it was necessary to understand the company's assets, debts, macroeconomic index and business model in power sector.

5.1 MACROECONOMIC PROJECTIONS

The macroeconomic figures forecasting was necessary to update the contracts linked with inflections indicators (IPCA) and Brazilian interest rates (SELIC, CDI and TJLP). The table 6 shows the indexes over the years.

Table 6 – Macroeconomic Projections

Inflation	2020	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	...	2050E
IPCA	4.5%	6.8%	3.8%	3.3%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	…	4.0%
IGP-M	23.1%	19.2%	4.7%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	...	4.0%
Interest Rates													
Selic	2.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	…	7.00%
CDI	1.90%	6.90%	6.90%	6.90%	6.90%	6.90%	6.90%	6.90%	6.90%	6.90%	6.90%	…	6.90%
TJLP (Nominal Rate)	4.55%	5.55%	5.80%	5.80%	5.80%	5.80%	5.80%	5.80%	5.80%	5.80%	5.80%	…	5.80%

Source: Elaborated by the author

The information provided by the central bank of Brazil was used as a database for the projections. As assumption, the long-term currency exchange rate is adjusted for the difference between Brazilian and American inflation.

5.1.2 Projection of Financial Numbers

Operating revenues were modeled based on the assets owned by the Company, that is, in our projection we only use the operating assets listed above. However, it is important to highlight that the company has expansion plans through new acquisitions.

The generation companies have long-terms contracts that are adjusted by IPCA throughout the years. In this project, we used the IPCA projected to adjust the revenue, since the only sources of revenue, in our approach, are the power plants.

The PPAs tenors are usually 30 years, it means that the company has long-term contracts as shown below in table 7, and for this reason the income statements were projected until the year 2050. After 2050, it was used a terminal value.

Table 7 – PPA Distribution by type of market

PPA Distribution (MWm)	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	..	2050E
Assured Energy	794.4	794.4	794.4	794.4	794.4	794.4	794.4	794.4	794.4	794.4	..	794.4
Regulated PPAs ("ACR")	426.6	426.6	473.7	473.7	473.7	473.7	473.7	473.7	473.7	473.7	..	473.7
Bilateral PPAs ("ACL")	326.9	309.4	243.9	220.4	211.3	204.2	204.2	204.2	204.2	204.2	..	204.2
Uncontracted	23.4	40.9	59.3	82.8	91.8	98.9	98.9	98.9	98.9	98.9	..	98.9
PPA Distribution (%)	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	..	**2050E**
Regulated PPAs ("ACR")	54.9%	54.9%	60.9%	60.9%	60.9%	60.9%	60.9%	60.9%	60.9%	60.9%	..	60.9%
Bilateral PPAs ("ACL")	42.07 %	39.82 %	31.39 %	28.37 %	27.20 %	26.29 %	26.29 %	26.29 %	26.29 %	26.29 %	..	26.29 %
Uncontracted	3.02%	5.27%	7.64%	10.66 %	11.83 %	12.74 %	12.74 %	12.74 %	12.74 %	12.74 %	..	12.74 %

Source: Elaborated by the author

The Company shows the PPAs contracts on its public financial statements, but only until 2030. As we can see above, after 2026, the proportions between the markets ACR and ACL get stable, and as assumption, that proportion was used as stable to project the following years until 2050. In addition, the company also inform the average of R$/MWm per year until 2030, as shown in table 8. To determine the energy price (R$/MWm) for the years after 2030, an adjustment by IPCA over the following years was considered.

Table 8 – Sales Prices by type of market

Sales Prices (R$/MWh)	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	...	2050E
Average Price[1]	227.3	225.2	218.2	219.6	220.4	222.6	226.4	230.2	234.2	237.5	...	635.4
Regulated Price	228.5	228.5	218.3	218.3	218.3	218.3	218.3	218.3	218.3	215.6	...	666.5
Bilateral Price	221.2	206.1	187.4	181.6	173.5	169.5	169.5	169.5	169.2	169.2	...	523.0
Spot Price	232.3	241.2	249.0	259.0	269.4	280.1	291.3	303.0	315.1	327.7	...	718.1

Source: Elaborated by the author

The spot price listed above is the energy price that the uncontracted energy will be sold. Here, to determinate the spot price, the historical PLD was used to calculate the average. The considered spot price in 2021 is R$ 232.38, and for the following years, an adjustment by IPCA was applied.

The cost of sales is a key part of performance and profitability for company's business. This account represents the energy that is purchased from third parties and is intended to supplement the Generation in relation to the position sold by the Company at CCEE. This cost arises when the assets (power plants) do not have sufficient energy to delivery and honor their PPAs.

It is important to highlight that we used consolidated financial statements to model this valuation, and there is a trading company, which may have losses or gain arising from long or short positions and evaluated through mark-to-market. The trading participation in the company's results could not be determined using only public information. Thus, the average of last 5 years from a similar and older company in generator sector was used to determine the ratio between gross revenue and cost of sales to be used in the projected years. The company used was CPFL ENERGIAS RENOVÁVEIS S.A. that has a cost of sales ratio of 27.09%.

A better approach to determining this cost is to use some statistical method to find a proportion between gross revenue and cost of sales. This is a limitation that can be explored in future studies.

The Selling general and administrative Expenses (SG&A) account consolidate four main group of expenses, as such: (i) Personnel, general and administrative expenses; (ii) Share-based payment program; (iii) Depreciation and amortization; and (iv) Consultancy and auditor services.

To determine the proportion between gross revenue and SG&A to be used in the following years, the historical average in the past 5 years was used to estimate it. The ratio calculated is 4.14%.

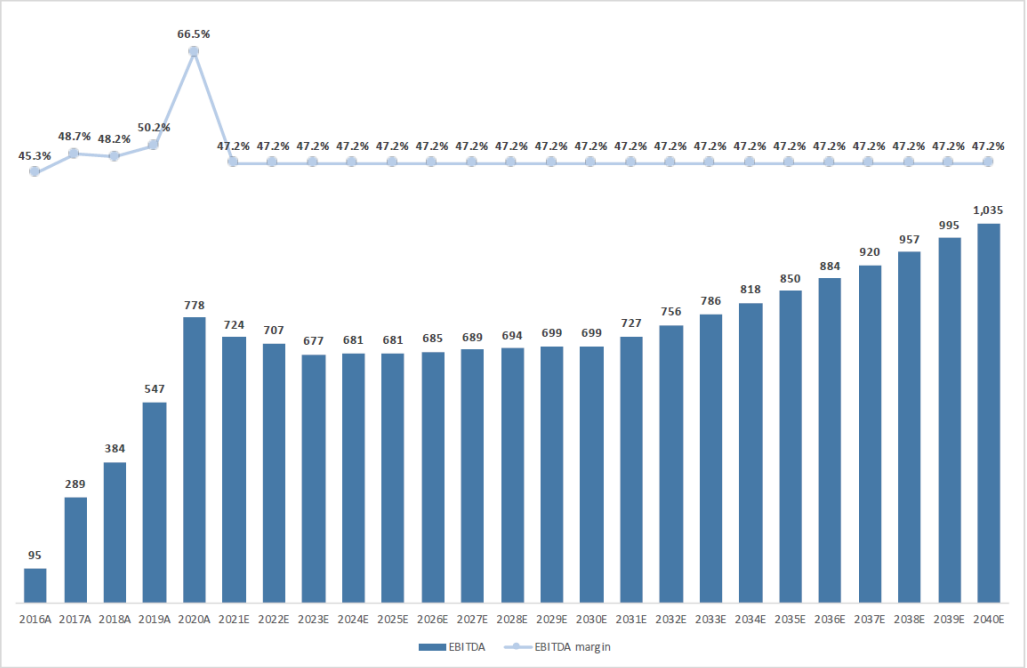
The company's growth strategy is the purchase of discounted assets, and the main group that this account consolidates is the gain from bargain purchase; however, to align the project propose, the other operation item account was disregarded, that is, null values were assigned in the projected years. The only source of revenue for this study must come from power plants.

The Associates account on income statement represents the entities that the company has some participation in their equity. For the purpose of the project, this account was set as null for projected years.

The historical average of depreciation and amortization reported in the past 5 years was used as premise for the projected years. The depreciation and amortization cost has a historical average of 15.79% of the gross revenue.

The EBITDA is the operational profit from the assets. The figure 7 below shows EBITDA over the years projected. As expected, EBITDA grows in the same proportion as gross revenues are adjusted for inflation, since the PPAs are adjusted by IPCA and expense accounts (Cost of sales and SG&A) are proportional to gross revenues.

Figure 7 – EBITDA (BRL million) over the projected Years



Source: Elaborated by the author

As shown above, the EBITDA margin will be stable in 47.2% over the projected years, for the reason explained at the beginning of this section, that the expense accounts are proportional to gross revenues.

At the end of 2020, the company had 60.53% of the indebted capital, and this capital structure was used as a premise to project future years. The net interest expense over the years was calculated from the company's debts (determined by the capital structure) and the cost of debt (kd), in which both variables,

as a premise, are unchanged over the years. The cost of debt will be more discussed in the next sections of this study, however, the cost of debt used was 7.85%.

The companies owned by Omega Geração SA adopt the taxation regime whereby taxable profit is based on accounting records (Lucro Presumido) or computed as a per centage of gross revenue (Lucro Real). The companies adopting taxable profit based on accounting records compute income based on book income, adjusted by expenses or rev- enues for which taxation is not permitted or required, whether temporarily or permanently. Taxes are calculated at the rate of 34% on taxable profit. Tax losses can be offset in operations taxed based on accounting records, limited to 30% of taxable profit accrued in the year. However, considering a base scenario, the taxation considerate for the projected years was 34.00% rate on profit.

In the projected cash flow, the company will pay dividends over the years for the purpose of maintaining its capital structure.

In accordance with the project's objective, it was adopted as a modeling premise that the company would not buy any more assets and would also not expand extra capital on its power plants. Given this, CAPEX will be equal to depreciation and amortization for projection purposes.

As assumption, the company's sector does not have working capital on its operations, this can be valid since generator companies do not have storage and the main or totally source of revenues are from long-term contracts that will provide predictability in the company's cash. In view of this fact, the working capital was set as null for the projected years.

NOPAT is an important indicator in this model, since the company will not purchase any new assets, the net change in working capital is null and the CAPEX equals to depreciation and amortization. Using these assumptions, NOPAT will be equal to the free cash flow to the firm over the projected years.

The discount rate is the cost of capital that will be used to discount the firm's cash flow. In this study, it was used the Weighted Average Cost of Capital (WACC). The company's capital structure was structured as follows: 39.47% Equity and 60.53% Debt; to maintain this capital structure, it was considered the company pay dividends and borrow money from loans over the future years.

The cost of equity for power sector in 2020 was 10.75%. This information is available on the KE - CUSTO DO CAPITAL PRÓPRIO (2021) website. The shareholders' fund (Equity) equals 39.47% of the company's liabilities. On 12/31/2020, the company cost of debt was 7.85%, in which the debt equals 60.53% of the company's liabilities. This information is available on the company's financial statements. The company's WACC is 7.26%. per year.

5.2 VALUATION RESULT

Throughout Discounted Cash Flow to the Firm (DCFF) the Enterprise Value of Omega was calculated, in which, to be aligned with the study proposal, the growth rate was considered null in the terminal value, since the company's revenue will be adjusted for inflation. The perpetuity approach was used for calculate the terminal value. The company's equity was calculated using the following formula:

$$\text{Equity} = \text{Enterprise Value} - \text{Net debt} \quad (5.1)$$

Whereupon,
Enterprise Value = DCF 30years + Terminal Value = R$ 8,066 MM; and Net Debt = R$ 5,015 MM. Thus, the fair value of the company's equity, assuming the assumptions listed in this study, is R$ 3,050 MM.

5.2.1 Model Sensitivity

The discounted cash flow is sensitive to key assumptions that were followed in this project, such as the long-term growth rate (G), the weighted average cost of capital (WACC), the energy spot price and the cost of sales, since the consolidate company's financial statements used to model have a trading company that can impact materially this account. As a result, two tables were created, ones which can demonstrate the equity valuation sensitivity on these variables.

5.2.2 Growth Rate and Weighted Average Cost of Capital (WACC)

The company's equity sensitivity on Growth Rate and Weighted Average Cost of Capital is shown below in table 9. This table helps to check the possible scenarios that can be created changing the growth rate and WACC. In addition, the growth rate is used in the terminal value to determine the return in perpetuity.

Table 9 – Equity (MM) sensitivity on two variables - Growth Rate and WACC

G/WACC	6.00%	6.50%	7.00%	7.50%	8.00%	8.50%	9.00%	9.50%	10.00%
2.00%	R$ 6,741	R$ 5,313	R$ 4,183	R$ 3,267	R$ 2,512	R$ 1,880	R$ 1,343	R$ 883	R$ 484
2.50%	R$ 7,356	R$ 5,728	R$ 4,471	R$ 3,473	R$ 2,661	R$ 1,990	R$ 1,425	R$ 945	R$ 531
3.00%	R$ 8,176	R$ 6,262	R$ 4,832	R$ 3,724	R$ 2,840	R$ 2,119	R$ 1,521	R$ 1,016	R$ 585
3.50%	R$ 9,324	R$ 6,974	R$ 5,296	R$ 4,037	R$ 3,058	R$ 2,275	R$ 1,634	R$ 1,100	R$ 647
4.00%	R$ 11,045	R$ 7,971	R$ 5,915	R$ 4,441	R$ 3,331	R$ 2,465	R$ 1,769	R$ 1,198	R$ 720
4.50%	R$ 13,915	R$ 9,466	R$ 6,781	R$ 4,979	R$ 3,682	R$ 2,703	R$ 1,935	R$ 1,316	R$ 806
5.00%	R$ 19,655	R$ 11,958	R$ 8,080	R$ 5,732	R$ 4,150	R$ 3,008	R$ 2,142	R$ 1,461	R$ 909
5.50%	R$ 36,873	R$ 16,942	R$ 10,245	R$ 6,861	R$ 4,805	R$ 3,416	R$ 2,408	R$ 1,641	R$ 1,035
6.00%	R$ 54,091	R$ 31,893	R$ 14,576	R$ 8,744	R$ 5,788	R$ 3,986	R$ 2,763	R$ 1,873	R$ 1,192

Source: Elaborated by the author

5.2.3 Cost of Sales and Energy Spot Price (PLD)

Considering growth rate null, the company's equity sensitivity on Cost of Sales and Energy Spot Price is shown below in table 10. The ranges of numbers were chosen considering possible scenarios in the power sector.

Table 10 – Equity (MM) sensitivity on two variables - Cost of Sales and PLD.

CS/MWh	R$ 100.00	R$ 150.00	R$ 200.00	R$ 250.00	R$ 300.00	R$ 350.00	R$ 400.00
10.00%	R$ 4,994	R$ 5,389	R$ 5,783	R$ 6,177	R$ 6,571	R$ 6,965	R$ 7,359
20.00%	R$ 3,411	R$ 3,743	**R$ 4,075**	**R$ 4,407**	**R$ 4,738**	R$ 5,070	R$ 5,402
30.00%	R$ 1,828	R$ 2,098	**R$ 2,367**	**R$ 2,636**	**R$ 2,906**	R$ 3,175	R$ 3,445
40.00%	R$ 245,000	R$ 452,000	R$ 659,000	R$ 866,000	R$ 1,073	R$ 1,280	R$ 1,488

Source: Elaborated by the author

6 CONCLUSION

This study carried out the valuation of the operational power generation assets of the company OMEGA Geração S.A. based on the Discounted Cash Flow (DCF) methodology. For this approach, projections were made for the company's future cash flows using as assumptions the knowledge in the power sector and historical data of the company, in which, after the projections, the present value of the cash flows was calculated using a discount rate.

The assumptions used in this study to find the future cash flow were calculated using simple arithmetic mean based on the company's reported results for the last 5 years (2015-2020). In addition, the cost of sales ratio limitation in the process of modeling the company's future results was fixed by assuming indicators from companies in the same sector and with similar assets. Also, as limitation in this work, the accounts payable and receivable in the model were considered null.

The company's equity value calculated throughout the Discounted Cash Flow (DCF) method in this study is R$ 3,050 millions. It is important to emphasize that the equity value calculated in this work is not an investment recommendation, since the academic study is the main purpose of this work.

In order to demonstrate the sensitivity of the model in face of key variables for the sector, this work demonstrates two sensitivity tables that show the value of the equity in face of the variation of some assumptions: the first table presented deals with the change in the company's growth in perpetuity and the variation in the WACC; and the second table has as model variables the cost of sales and the price of energy in the spot market.

However, this study could use more sophisticated statistical models to project the company's future results, and create solutions for the limitations of this work, since the assumptions used in this study were calculated using simple arithmetic means. As a suggestion for future studies, the work can use the Monte Carlo model to determine the future price of spot energy, as well as other metrics present both in the discounted cash flow model and in the company's indicators.

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