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“SWIMMING IN A LAKE OF SHARKS: EDP’S ELECTRIC MOBILITY OFFER FOR
THE B2B SEGMENT”

PRICING STRATEGY

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Note: Given the nature of this work project, some of the following contents are common between the group report “Swimming in a Lake of Sharks: EDP’S Electric Mobility Offer for the B2B Segment” (especially the section 9.2 Pricing) and the individual report “Swimming in a Lake of Sharks: EDP’S Electric Mobility Offer for the B2B Segment: Pricing Strategy”.

1. Pricing

The mission of a company's marketing mix is to create value for customers. By launching a new product/service in the market, a brand like *EDP Frota Verde* needs to create value to customers through the product/service offering, the communication of its value through promotion, and place of the product/service in the market. Pricing, on the other hand, is responsible for capturing value from customers. According to Dolan and Gourville (2014), this P of the service mix has to justify how the value created by the other elements of the mix can be split between the customers and the company. The most effective way for a company to maximize its profit is to get the right pricing strategy (Dolan and Gourville 2014). As aforementioned, in order to capture this value to customers, it is extremely important that the company creates a good marketing communication campaign to effectively communicate the value of the offering. Therefore, *EDP Frota Verde* ought to capture this value through a feasible pricing strategy, which means to capture the value with a high price that will be further explained in this document, together with high marketing expenditures (Appendix 1) (section 9.2 Price group report). As stated by Nagle and Smith (1994), as well as Nagle, Hogan and Zale (2014), there are 3 tactical pricing orientations that a company can use. The first one is a cost-driven (or cost-plus) pricing approach, where the company sets the prices based on costs and applies a markup to its cost to obtain the product price (Dolan and Gourville 2014; Nagle and Smith 1994). Secondly, the value-based pricing approach takes into consideration the consumers' perceptions of the value of a product/service and their willingness to pay, setting the price according to its value to its chosen customers (Dolan and Gourville 2014). Finally, the competition-driven pricing approach, a company pricing strategy based on competitors' prices. According to this, *EDP Frota Verde* should use a value-based pricing approach instead of a cost-based pricing approach, as it is crucial to considerer the value and benefits of the products/services to customers in this pricing strategy, instead of an approach that sets price according to the company's costs and pre-determined

markups (Nagle and Smith 1994) (section 9.2 Price group report). As stated by Nagle, Hogan and Zale (2014) “companies that adopted a value-based pricing strategy and built the organizational capabilities to implement the strategy earned 24% higher profits than industry peers.”. Moreover, a good pricing strategy should follow the subsequent five levels of the pricing strategic pyramid, that will be further explained (Appendix 2) (Nagle, Zale and Holan 2014). A pricing strategy is crucial for a business’ success. *EDP Frota Verde* is creating value through a value-based pricing approach, structuring the prices using differentiated and bundled or unbundled offerings (value creation), using volume discounts, purchase quantity fences, and a pricing menu, through a price-offer configuration (price structure). Also, it should communicate, as previously mentioned, a feasible pricing strategy (price and value communication), which has to be aligned with EDP’s group business strategy and policies (pricing policy). A price level should also be implemented in order to set prices that maximize the company’s profits and allow to capture the differentiated value offered by *EDP Frota Verde* (price level). Therefore, the True Economic Value (TEV) will be defined in order to set the final price, which will be explained in the next section. A pricing objective should also be implemented in order to settle the price. A skimming strategy sets high prices based on the products/services value to consumers to capture value of a new product (Nagle, Hogan and Zale 2014). A penetration strategy sets a low price for the new product/service in order to penetrate the market faster and create a large customer base (Nagle, Hogan and Zale 2014). Finally, a neutral strategy sets the prices according to a company’s competitors’ prices and range in the market that most customers usually buy (Nagle, Hogan and Zale 2014). Since *EDP Frota Verde’s* Business to Business (B2B) customers are likely to highly value the product’s differentiating attributes, a skimming pricing strategy should be implemented in order to capture high margins at the expense of large sales volume (Nagle, Hogan and Zale 2014) (section 9.2 Price group report). *EDP Frota Verde’s* customers could be convinced to pay more for the service, in comparison to other market services, as it will offer a one stop shopping solution,

which will offer much more than other services in the market. Thus, customers will be willing to pay more for a service that offers differentiated value, such as *EDP Frota Verde's* offering. Hence, it is important to boost marketing activities (section 9.4 Communications Plan group report). This strategy is feasible since *EDP Frota Verde* ought to follow a high-price strategy, “to capture the perceived value thereby created” and high marketing expenditures strategy (Dolan and Gourville 2014). To pursue a skimming strategy, the TEV will be established, considering the potential savings that the offering enables to customers. (section 9.2 Price group report)

2. The Value-based Pricing Approach for the Customers

Value is merely perceived as monetary units – functional or technical – and also psychological benefits and satisfaction that the customer receives in exchange for the price paid for a product/service, taking into account the different offers and prices available in the market (Nagle, Hogan and Zale 2014). As mentioned before, according to Dolan and Gourville (2014), the value-pricing approach focuses on the economic value created by a product/service for customers, setting processes to capture a portion of the same value for the company. The price is settled based on the value of a product as perceived by the customers (Dolan and Gourville 2014). As stated by Nagle, Hogan and Zale (2014), the economic value depends on the next best alternatives that customers have available to satisfy the same need, and the customer's choice that can be captured in the price. Furthermore, it is important to understand the value of the product to satisfy customers and communicate the right value (Nagle, Hogan and Zale 2014). This approach bases the price on its value to customers and their willingness to pay, and the true benefits of the offering valued by them (Nagle, Hogan and Zale 2014; Gallo 2015). As stated by Dolan and Gourville (2014), the key elements of a value-based pricing approach are represented in the value-pricing thermometer (Appendix 3). First of all, the TEV is the value that a fully informed buyer expects from a product/service. The Perceived Value (PV) is the value of the product/service in the mind of the customer – the value they are willing to pay; however, the customer is not completely

informed of the offer's benefits. The company can influence the PV through marketing efforts and promotion. After that, there is the Product/Service Price defined by the company. The Cost of Goods Sold (COGS) represents the costs that a company supports to develop the service. Finally, an initial price will be defined for *EDP Frota Verde's* service. (section 9.2 Price group report)

2.1. True Economic Value (TEV)

According to Dolan and Gourville (2014), the TEV is a model of the value that a fully informed buyer would expect from a product or service, and it takes in consideration customer's needs and preferences, as well as the performance differential. The most important components of the TEV are the cost of the next best alternative and the value of the performance differential (Appendix 4) (Dolan and Gourville 2014). The next best alternative (or competitive reference value) is considered to be the current offer in the market. A company's main goal is that its product's value becomes superior to the value of this one. On the contrary, the value of the performance differential is the added value of the offer and benefits of a product/service to customers, including any differences between a company's product/service and the next best alternative product/service. This differentiation justifies customers' willingness to pay of a product/service. The differentiation can be positive, as the price captures the unique value delivery; or it can be negative, as the new products/service of the service, which are possibly comparable to the next best alternative (Nagle, Holan and Zale 2014; Gallo 2015). The TEV for *EDP Frota Verde* is calculated by summing up the next best alternative (diesel cars' annual rent and annual fuel consumption, computed considering an operational leasing financial scheme) and the value of the performance differential, which is the difference between the Total Cost of Ownership (TCO) savings (as the positive differentiation value) the customer will achieve by switching from diesel cars to Plug-In Electric Vehicles (PEVs), and the price paid by *EDP Frota Verde's* service (as negative differentiation value), which includes consultancy services and the

renting of floor charging stations of 22Kw (section 9.2 Price group report). In order to calculate the TCO savings, and considering that the electric vehicles (EVs) service is wide, 3 types of car segments were defined: small, medium and premium. Each of them have different fiscal advantages (Appendices 5 & 6). For instance, a Nissan Leaf (with an annual spending of 5,140€) compared to a Ford Focus (6,240€) is expected to deliver savings of 1,100€ per year, and this value increases for higher category of cars. Regarding *EDP Frota Verde's* offering, 3 company's profiles were defined (with 10, 20 and 100 cars) for which there is a difference in terms of the consultancy services price (simple, medium and complex) and in the number of charging stations rented (according to the ratio of 1 charger for 4 vehicles) (Appendix 5). The consultancy price was defined as 800€/day plus a fixed fee for the GPS tracking analysis for the whole project, according to its complexity (Appendix 7). Concerning chargers, four types will be analyzed for *EDP Frota Verde's* offer, with two different selling options. In order to calculate the TEV, only the floor charger with 22kW (two sockets, for interior and/or exterior) for the renting selling option was considered, since it is the most expensive offer and the price already includes charging services. The annual rent for a floor charger of 22kW is 2,135€ per unit per year. Besides, as mentioned before, the TCO was calculated for 3 segments of cars (small, medium and premium), and for the 3 types of consultancy projects according to its complexity (simple, medium and complex), which gives a total of 9 possible combinations (Appendix 7). For instance, the TEV for the combination between the medium car segment and consultancy is 179,648€, which represents a fully informed and rational buyer who, according to this cost structure, would be indifferent between the next best alternative and the *EDP Frota Verde's* service (Appendix 7) (Dolan and Gourville 2014). (section 9.2 Price group report)

2.2. Perceived Value (PV)

As described by Dolan and Gourville (2014), the PV is the value of how a customer perceives a new product/service and its willingness to pay for it. In addition, the PV corresponds to the

customer's beliefs about the specific benefits offered by the product/service (Dolan and Gourville 2014). To calculate the PV and to try to simulate the customers' beliefs according to the research conducted, some assumptions were made. For the calculation of the next best alternative, because the diesel cars' rents are widely available, the rents were assumed to be perceived correctly, such as the same diesel cars' rent that was used to calculate the TEV (LeasePlan n.d.; ZEEV n.d.). However, the fuel consumption was assumed to be perceived as a lower cost due to the volatility of its price, which means, lower than the value used to calculate the TEV (Appendix 7). Regarding the value of the performance differential, as for the TCO savings, since customers are generally not fully aware of the potential savings and fiscal advantages of PEVs, they were assumed as undervalued (Appendix 7). Concerning the price of *EDP Frota Verde's* offering, being a new offer in the market and taking into consideration the lack of education of the general customers on the subject, the expected price for the offer was also considered as lower for both the consultancy services (680€/day) and the renting of the charging stations (1,902€ per year). Following these assumptions, the PV was computed for the 9 possible combinations (Appendix 7). For instance, the PV for the combination between the medium car segment and consultancy is 169,703€ (Appendix 7), which means that customers perceived a lower price for *EDP Frota Verde's* service. The PV can be often influenced by marketing efforts toward the customer, and they should transform an uninformed and skeptical customer into a fully informed and rational buyer (Dolan and Gourville 2014). (section 9.2 Price group report)

2.3. Costs of Goods Sold (COGS)

The COGS represent the fully loaded variable costs of producing the product being sold, and in order to be profitable, a company should set a price above its COGS (Dolan and Gourville 2014). COGS are the based level of the value thermometer. For the calculation of the TEV, the COGS must include chargers' COGS (Appendix 7). Since the rented chargers were the ones used to calculate the TEV, from now on, COGS will be referred as costs. As *EDP Frota Verde's* offer

has a TEV higher than its costs, it will contribute to the company's profitability. If *EDP Frota Verde* can sell enough units of products and services at a price above its costs, it will be a thriving business (Dolan and Gourville 2014). *EDP Frota Verde* business solution needs several components to operate successfully. Regarding the costs for the rented chargers, this price takes into consideration the cost of the hardware, the cost of installation and transportation, and the cost of operation. In addition, the total costs of the chargers in a simple consultancy project are 4,600€, in a medium consultancy project are 7,600€ and in a complex consultancy project are 38,000€ (section 9.2 Price group report). Concerning the other costs, besides the one used to calculate the TEV, *EDP Frota Verde* has different types of products/services, so different types of costs. Regarding consultancy, the costs with the energy expert consultant, which includes salary per day (considering a salary of 3,500€), insurance (at a tax of 1%), social security (at a tax of 23.75%), food allowance (7.23€/day), and transportation (50€/day), have to be considered, representing a total cost of 255.70€ per day of consultancy (Appendix 8). In what concerns chargers, the difference is between selling options. For the buying option, the cost of hardware and the costs of installation and transportation per unit (250€) must be considered (Appendix 9). On the contrary, for the renting option, the cost of hardware should be considered, as well as the costs of installation and transportation per unit (250€), and cost of operation per year and unit (560€), which includes the cost of maintenance, operation, insurance of the equipment and of responsibility (Appendix 10). Regarding the charging services, the costs of operation (560€/year/unit) are included, as already described above (Appendix 11) (section 9.2 Price group)

2.4. Product/Service Price

Finally, the **price for the whole bundle** will be set in order to be compared with the TEV and the PV. It includes the annual rent and annual energy consumption for the PEVs, the consultancy service and the chargers. The price for the whole bundle will be set below the PV and above the costs, so *EDP Frota Verde* is bound by customer's PV, which is influenced by the TEV and *EDP*

Frota Verde marketing efforts to communicate the TEV (Dolan and Gourville 2014) (Appendix 7). As *EDP Frota Verde* is using a skimming pricing strategy, the difference between the PV and the price ought to be very small. The price will be generally set below the PV. However, for some car segments, the average price could be slightly higher than the PV. This happens because the PEVs' rents are currently still higher than diesel cars' rents. However, because *EDP Frota Verde* offers value differentiation through consultancy and one-stop shopping, enabling potential costs savings (higher than the actual price of consultancy and the chargers offered in bundling), *EDP Frota Verde* will convince customers, through extensive marketing activities, of the reasons why they should be willing to pay more for this added value offer (section 9.4 Communications Plan group) (Dolan and Gourville 2014). So, customers with an extra small amount of money, can have a differentiated value offer of a full electric mobility solution, which could be bought whole in one single place, instead of buying each part from different companies. The final prices for the individual parts of the service will be set below. (section 9.2 Price group report)

3. Price Setting

EDP Frota Verde does not define the prices by segments, which means both targets have the same price for all business services (section 7 STP group). *EDP Frota Verde* will offer the following products and services: consultancy services (800€/day), charging stations (with two selling options, such as buying or renting), and charging services (700€/unit) (Appendix 11,12,13&14; section 9.1 Service/Product group). The prices were defined according to the market average analysis and information provided by *EDP Comercial*. Customers can choose the best option relatively to their needs, so different prices have been defined through pricing formulas with different variables in order to customers' purchasing decision to be easier to calculate (Appendix 15). Furthermore, *EDP Frota Verde* allows customers to renew the contract after a 4-year period (section 9.2 Pricing group). Moreover, customers can breach the 4-year contract after 2 years of contract, for which exit mechanisms have been created (section 9.2

Pricing group). In what concerns price customization, this respects prices that vary across customers, for instance controlling the availability of prices, set the price based on buyer characteristics, and manage the product-line offer (Dolan and Gourville 2014). Regarding price offer configuration, it can be used as bundling and pricing menu maps; price metrics (measure value and cost to serve) such as performance-based metrics and tie-ins as metrics; and price fences (charge different prices to customers with different characteristics) such as buyer identification, purchase location, time of purchase and purchase quantity (volume, order, step and two-part discount) (Nagle, Hogan and Zale 2014). These are used to expand company's profit margins by aligning its prices, service bundles and capacity of utilization with the different value levels demanded by different customers (Nagle, Hogan and Zale 2014). *EDP Frota Verde* will use a *pricing menu* (price offer configuration) and *purchase quantity* (price fences), the ones better to establish premium prices to offer different value for different customers through different prices (Nagle, Hogan and Zale 2014). *EDP Frota Verde* uses this pricing strategy to convince customers to buy bundled and different products/services besides consultancy, to purchase more units to increase its profit margins. (section 9.4 Pricing group)

4. Margins: Distribution Channel Margins and Break-Even Analysis

Margins are the difference between a product's price and cost (Pearson Education 2008). The **channel margins** of a product/service's distribution channel should be defined for *EDP Frota Verde* who, as well as other companies, depending on other businesses, to ensure that the final selling price is attractive to customers. The channel can have different performers (e.g. manufacturer, retailer, wholesaler and final customer or end-user), and each one has different functions in the value chain. Their contribution and relevance ought to be compensated financially by the unit margin/contribution they receive, defined as the difference between the per-unit revenue received by a firm and the per-unit variable cost of production, characterized as the difference between what a manufacturer charges and what the customer will pay (Dolan and

Gourville 2014). Regarding *EDP Frota Verde*, consultancy has no margins through the channel because the only player will be *EDP Frota Verde*, not being tied to any other. Concerning chargers, the distribution channel is divided in the same way for both renting and buying options, as well as for the charging services. Therefore, the margins are the same. *EDP Frota Verde* is then tied to chargers' manufacturer, tying the supply of these products to this player. An estimated margin of 30% was defined for the chargers' manufacturer. For *EDP Frota Verde*, as the retailer, a margin of 20% (according to *EDP Comercial*) was defined for the chargers buying option and for charging services, and a margin of 31% (according to *EDP Comercial* margin of 20%, and renting margin of 11% assumed) for renting a charger was assumed. The final customer is the B2B segment customer. It is important to mention that in the retailer channel for chargers, because the unit price for both options is different, the selling price for customers will also be different (Appendixes 16,17&18). After the unit margins are defined, fixed and variable costs per unit should be determined, as well as selling prices per unit and contribution margin, to calculate the **break-even point**. This one is the amount of money for which an asset or a product/service should be sold (sales levels or volume) to cover and pay the costs of acquiring and owning/manufacturing/providing this asset (fixed and variable costs), that generates a profit of zero at the break-even sales volume (Investopedia 2017; Gallo 2014; Dolan and Gourville 2014). Regarding consultancy, fixed (salary, insurance and social security) and variable (costs of installation and transportation, and food allowance) costs were considered, so the break-even is achieved with one day of consultancy work. This means it needs to sell only one day of work to cover costs and be profitable (Appendix 19). Concerning chargers (both selling options) there is no break-even point, as there are no fixed costs to cover, but only variable costs are considered (Appendixes 20 & 21). Respecting charging services, there are only fixed costs, so the break-even is achieved after selling one unit (Appendix 22). On balance, *EDP Frota Verde* ought to be a thriving business.

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APPENDIX

PRICING STRATEGY

Appendix 1 – Setting Price and Marketing Efforts



Source: Reprinted from "Principles of Pricing," HBS No. 506-021 by Robert J. Dolan and John T. Gourville. Copyright © 2005 by the President and Fellows of Harvard College; all rights reserved.

Figure 1: Setting Price and Marketing Efforts - Source: Dolan and Gourville (2014)

Appendix 2 – The Strategic Pricing Pyramid

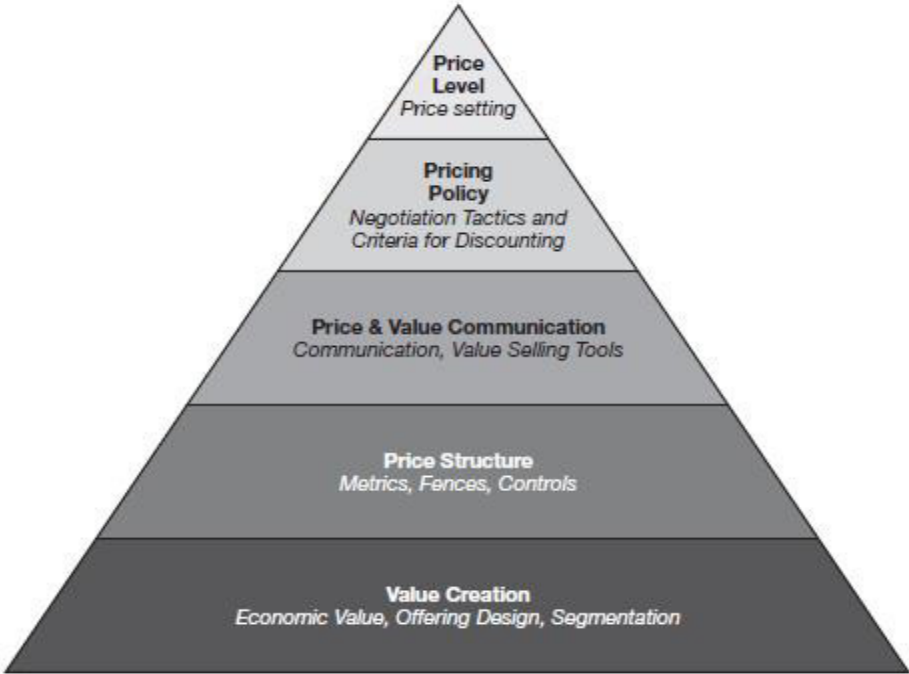


Figure 2: The Strategic Pricing Pyramid – Source: Nagle, Zale and Holan (2014)

Appendix 3 – Value Thermometer with Average calculations



Figure 3: Value Thermometer with Average calculations – Source: Author’s Creation according to Dolan and Gourville (2014)

Appendix 4 - Equation 1 – TEV Calculation:

TEV = cost of the Next Best Alternative + value of the performance differential

Source: Dolan and Gourville 2014

Appendix 5 – Assumptions

Car segments:

- Small: Price of acquisition below 25,000€
- Medium: Price of acquisition between 25,000€ and 35,000€
- Premium: Price of acquisition above 35,000€

Consultancy Complexity:

- Simple: 3 days (equal to 24 hours), 10 cars
- Medium: 6 days (equal to 48 hours), 20 cars
- Complex: 12 days (equal to 96 hours), 100 cars

Ratio 1 charger for 4 EVs:

- Simple: 10 EVs, 3 chargers
- Medium: 20 EVs, 5 chargers
- Complex: 100 EVs, 25 chargers

Appendix 6 - Total Cost of Ownership (TCO)

TCO Analysis and explanation (section 9.2 Price group report)

The TCO represents the total cost of an asset including all the expenses that are related to it and that go beyond the purchase price (Hutt and Speh, 2013). For the purpose of this thesis, the TCO of the vehicles was calculated assuming the vehicles that are financed through operational leasing. Operational leasing means there is a contract wherein the owner (lessor) permits the user (lessee) to use an asset for a particular period which is shorter than the economic life of an asset without any transfer of ownership rights. The lessor gives the right to the lessee in return for regular payments (rents) for an agreed period of time (The Economic Times n.d.). The rent of the operational leasing of a vehicle is a major part of the TCO and it usually includes: maintenance, insurance, tires, vehicle's substitution, 24h assistance, guarantee and Tax of Circulation (*IUC – Imposto Único de Circulação*) (LeasePlan 2015).

This means that for calculating the TCO of a vehicle in the case of operational leasing, one can use the rent, add consumption and account for the fiscal advantages (concerning both rents and consumption). The values used in this exercise were taken from LeasePlan, ZEEV, EDP SU, ERSE, *Preços dos Combustíveis Online* and each manufacturer's website concerning the rents for the vehicles, the electricity cost, the diesel costs, and the acquisition value of each vehicle.

The calculations for the different elements of the TCO are explained below:

Annual Rent:

- Monthly rent values $\times 12$.
- E.g. in the case of a Nissan Leaf and a Ford Focus this value adds up to 6,031€ ($503€ \times 12$) and 4,233€ ($353€ \times 12$) respectively (the values for the Nissan leaf are without VAT because it is deductible). (A)

Consumption:

- Assuming 25,000km per year, the electricity and diesel costs and each vehicle's autonomy.
- E.g. a Nissan Leaf, to do 100km, needs 12kWh, which costs 1.17€/100km. In a year (252 working days, 25,000km), this amounts to 292€ (as 1.17€ is already for 100km, for

25,000km the cost can be calculated as: $1.17\text{€} \times 25,000/100$). A Ford Focus has a consumption of 4.3L per 100km, which results in costs of 5.76€/100km (for a diesel price of 1.34€ per liter), amounting to 1,439€ per year (as 5.76€ is already for 100km, for 25,000km the cost can be calculated as: $5.76\text{€} \times 25,000/100$) **(B)** (Table 4).

Fiscal Advantages:

- The fiscal advantages that can be accounted are the VAT deduction and the reduction in the IRC (Tax on Corporate Income – *Imposto sobre o Rendimento de Pessoas Coletivas*) tax for BEVs in depreciations and Autonomous Taxation (*TA - Tributação Autónoma*) (Table 2).
- Regarding the VAT, it is possible to deduct 100% of the VAT for the rent and consumption of electric vehicles (LeasePlan 2015) E.g. for a Nissan Leaf, this amounts to 1,182€ to receive at the end of the fiscal year $[(503\text{€} - 409\text{€}) \times 12 + \frac{292\text{€}}{(1+23\%)} \times 23\%]$; being 503€ rent with VAT, 409€ rent without VAT, and 292€ annual consumption] **(C)**.
- Regarding the IRC, the depreciations were calculated. Since this is a case of operational leasing, and according to Circular nº 24/1991 of 19th of December, the only value that can be accepted as a depreciation cost are the depreciations that are not included in the rent and that correspond to the vehicle itself and not to the services included in a rent (assumed by the authors as 60% of a rent) **(D1)** that will be lower than the amortization if the vehicle was acquired in full by the company **(D2)** (Direção de Serviços do IRC 1991; Millenium BCP 2012).
 - E.g. for a Nissan Leaf, if the vehicle was bought by the company, the maximum amortization value would be $25\% \times \text{Acquisition Value}$ **(D2)** which is 5,028€ ($201,114\text{€} \times 25\%$) but, since the vehicle is financed through operational leasing, the value that can be accepted as a depreciation cost is only 2,942€ ($60\% \times \text{Annual Rent} = 60\% \times 409\text{€} \times 12$) **(D1)**.
 - However, according to Table 2, there is a maximum value for the depreciation of a vehicle that can be accounted **(D3)**: in the case of a BEV this value is 62,500€ and in the case of an ICE vehicle it is only 25,000€. This means that there is another bound for the depreciation which will not make any changes in the Nissan Leaf example, but for an

Audi A7 Sportback, it will. The maximum value accepted for an Audi A7 will be $25\% \times 25,000\text{€}$ which is 6,250€ (D3), even though, according to the amortization of the vehicle, it would be 19,593€ ($25\% \times \text{Selling Price} = 25\% \times 78,371\text{€}$) (D2) if the car was bought by the company or 9,455€ ($60\% \times 1,313\text{€} \times 12$) (D1) through operational leasing. So, in this case, only 6,250€ will be accepted and 3,205€ ($9,455\text{€} - 6,250\text{€}$) will not.

- This means that the maximum value accepted is the minimum value of D1, D2, and D3. And the IRC to pay will be the value that is NOT ACCEPTED (D).
- Still regarding the IRC, the tax related to Autonomous Taxation was calculated. According to Table 2, for different segments (determined by the acquisition value), ICEs will have to pay an extra tax of 10%, 27,5% or 35% on any expense with the car (rent and consumption). E.g. for a Ford Focus, this will mean an extra expense of 567€ [$\text{annual rent} \times 10\% + \text{annual consumption} \times 10\% + 25\% \text{ NOT ACCEPTED} = (10\% \times 353\text{€} \times 12) + (10\% \times 1,439\text{€}) + 25\% \times 0,00\text{€}$] per year.
- The total IRC to pay (E) will be the sum of the non-accepted value of the depreciations and the autonomous taxation paid on rents and consumption. E.g. for a Ford Focus, this will mean as already mentioned above 567€ per year [$\text{annual rent} \times 10\% + \text{annual consumption} \times 10\% + 25\% \times \text{NOT ACCEPTED} = (10\% \times 353\text{€} \times 12) + (10\% \times 1,439\text{€}) + 25\% \times 0,00\text{€}$].

Summing up:

- The annual TCO of a vehicle financed with operational leasing is: the Annual Rent (with VAT) + the Cost of Annual Consumption + IRC to pay – VAT to recover.
- For a Nissan Leaf this value adds up to 5,140€ per year (6,031+ 292 + 0 – 1,182) and for a Ford Focus it adds up to 6,240€ (4,233 + 1,439 + 567 – 0), which means that switching from a Ford Focus to a Nissan Leaf represents yearly savings of 1,100€ ($6,240\text{€} - 5,140\text{€}$). This value increases as the acquisition value of the vehicle increases: By switching from an Audi A7 to a Tesla Model S, the yearly savings add up to 5,809€ ($24,109\text{€} - 18,300\text{€}$) (Table 3).
- The TCO was calculated for 3 types of vehicle segments and for both BEVs and ICE vehicles. Vehicles with a selling price below 25,000€ are defined as small segment (Nissan Leaf and Ford

Focus), vehicles with a selling price between 25,000€ and 35,000€ are defined as medium segment (Renault ZOE and Renault Clio), and vehicles with a selling price above 35,000€ are defined as premium segment (Tesla Model S and Audi A7 Sportback).

Table 1: TCO Analysis

	<25k		25k-35k		>35k	
	EV	Diesel	EV	Diesel	EV	Diesel
	Nissan Leaf	Ford Focus	Renault ZOE	Renault Clio	Tesla Model S	Audi A7 Sportback
Selling price (w/ VAT)	€ 24 740	€ 24 348	€ 28 592	€ 25 320	€ 87 850	€ 78 371
Selling price (w/out VAT)	€ 20 114	€ 19 795	€ 23 246	€ 20 585	€ 71 423	€ 63 716
Rent (w/ VAT)	€ 503	€ 353	€ 807	€ 552	€ 1 845	€ 1 313
Rent (w/out VAT)	€ 409	€ 287	€ 656	€ 449	€ 1 500	€ 1 068
BEV battery capacity (kWh)	30	-	41	-	75	-
BEV autonomy (km)	250	-	300	-	490	-
Vehicle fuel consumption (L/100km)	-	4,3	-	3,5	-	4,5
Cost of consumption annual (B)	€ 292	€ 1 439	€ 333	€ 1 172	€ 373	€ 1 506
IRC - DEPRECIATIONS (ANNUAL)						
Annual Rent (w/ VAT) (A)	€ 6 031	€ 4 233	€ 9 680	€ 6 620	€ 22 136	€ 15 759
Annual Rent (w/out VAT) (A)	€ 4 903	€ 3 540	€ 7 870	€ 5 472	€ 17 997	€ 13 205
Part of the rent that corresponds to the vehicle acquisition and can be depreciated (assumption: 60%) (D1)	€ 2 942	€ 2 540	€ 4 722	€ 3 972	€ 10 798	€ 9 455
MAXIMUM DEPRECIATION						
Max value per vehicle (25%*Aquisition Value) (D2)	€ 5 028	€ 6 087	€ 5 811	€ 6 330	€ 17 856	€ 19 593
Max value according to the fiscal criteria (25%*criteria) (D3)	€ 15 625	€ 6 250	€ 15 625	€ 6 250	€ 15 625	€ 6 250
Max value acceptable (lowest of the 2)	€ 5 028	€ 6 087	€ 5 811	€ 6 250	€ 15 625	€ 6 250
REAL DEPRECIATION ACCEPTED						
! ACCEPTED min (D1, D2, D3)	€ 2 942	€ 2 540	€ 4 722	€ 3 972	€ 10 798	€ 6 250
! NOT ACCEPTED (D1-ACCEPTED) = (D)	€ -	€ -	€ -	€ -	€ -	€ 3 205
AUTONOMOUS TAXATION						
	0%	10%	0%	28%	0%	35%
From rents (E1)	€ -	€ 423	€ -	€ 1 820	€ -	€ 5 516
From consumption (E2)	€ -	€ 144	€ -	€ 322	€ -	€ 527
IRC TO PAY** (E) = E1+E2+D	€ -	€ 567	€ -	€ 2 143	€ -	€ 6 844
VAT - TO RECOVER (C)	€ 1 182	€ -	€ 1 872	€ -	€ 4 209	€ -
ANNUAL SPENDINGS (TCO) = A+B+E-C	€ 5 140	€ 6 240	€ 8 141	€ 9 934	€ 18 300	€ 24 109

Table 2: TCO Fiscal Advantages

	BEV	PHEV	ICE	Aquisition Value
IRC- TA	0.0%	5.0%	10.0%	<25 000€
	0.0%	10.0%	27.5%	25 000€-35 000€
	0.0%	17.5%	35.0%	>35 000€
	Expenses with the vehicles			
IRC- Dep	62 500 €	50 000 €	25 000 €	
	Maximum value			
IVA	100%	100%	0%	
	Acquisition rent deductible			
	100%	100%	50%	
	Consumption			

Table 3: TCO Savings – Annual Savings

	<25,000€	25,000€ -35,000€	>35,000€
	Nissan Leaf vs Ford Focus	Renault ZOE vs Renault Clio	Tesla Model S vs Audi A7 Sportback
TOTAL	1 100 €	1 793 €	5 809 €

Table 4: TCO Consumption of Electricity Prices

	km	kWh	L	Average of the consumption price
Nissan Leaf	100 km	12 kWh	-	1.17 €
Renault Zoe	100 km	13.67 kWh	-	1.33 €
Tesla Model S	100 km	15.31 kWh	-	1.49 €
Ford Focus	-	-	4.3 L	5.76 €
Renault Clio	-	-	3.5 L	4.69 €
Audi A7 Sportback	-	-	4.5 L	6.03 €

Average of Energy & Diesel Prices

Prices:	
€/kWh BTE Full	€ 0.13
€/kWh BTE Super Empty	€ 0.08
€/kWh MT Full	€ 0.11
€/kWh MT Super Empty	€ 0.07
€/kWh Average Cost per kWh	€ 0.097
€/L (DIESEL)	€ 1.34
Assumptions:	
Long usage rate	
Prices on December 1, 2017	

Source: Author's Creation according to selling prices (Audi n.d.; Ford n.d.; Nissan n.d.; Renault n.d.(a); Renault n.d.(b).; and Tesla n.d.), renting prices (LeasePlan n.d. and ZEEV n.d.), VAT (Código do IVA 2016), fiscal advantages for EVs (Direção de Serviços de IRC 1991; Millenium BCP 2012; LeasePlan 2015), energy prices (EDP SU 2017a&b; ERSE 2017) and diesel prices (Preços Combustíveis Online n.d.).

Appendix 7- True Economic Value (TEV)

TEV Calculation – Total Average

	TEV	PV	COGS
Consultancy Simple + Cars Small Segment + Charging Rent	60 647 €	53 055 €	4 560 €
Consultancy Simple + Cars Medium Segment + Charging Rent	88 769 €	83 918 €	4 560 €
Consultancy Simple + Cars Premium Segment + Charging Rent	223 665 €	217 307 €	4 560 €
Consultancy Medium + Cars Small Segment + Charging Rent	123 404 €	107 975 €	7 600 €
Consultancy Medium + Cars Medium Segment + Charging Rent	179 648 €	169 703 €	7 600 €
Consultancy Medium + Cars Premium Segment + Charging Rent	449 440 €	436 479 €	7 600 €
Consultancy Complex + Cars Small Segment + Charging Rent	621 243 €	543 511 €	38 000 €
Consultancy Complex + Cars Medium Segment + Charging Rent	902 467 €	852 149 €	38 000 €
Consultancy Complex + Cars Premium Segment + Charging Rent	2 251 423 €	2 186 029 €	38 000 €

Note: This calculation is made for 9 possible combinations, according to consultancy complexity (simple, medium and complex) and car segments (small, medium and premium), each one taking into consideration the chargers ratio defined as one charger for four EVs. The extensive calculation of the TEV is explained in the next section. Regarding COGS, it only refers to chargers' costs per year taking into account the ratio of 1 charger for 4 EVs.

Assumptions:

- Consultancy Simple: 10 cars, 3 days of consultancy → 10 EVs, 3 chargers
- Consultancy Medium: 20 cars, 6 days of consultancy → 20 EVs, 5 chargers
- Consultancy Complex: 100 cars, 12 days of consultancy → 100 EVs, 25 chargers

(section 9.2 Price group report)

TEV Overall Calculation

TEV: Value of Performance Differential (TCO Savings - *EDP Frota Verde* offering) + Next Best Alternative (ICEs Rent + cost of fuel consumption)

TEV	Value of Performance Differential					Next Best Alternative					Total TEV (1 year out of 4)
	Negative				Positive	ICEs Rent (annual spending) (w/ IVA)			Cost of Fuel Consumption	Total 1 year (out of 4 years)	
	Charging 22kW Floor Rent (annual rent)	Consultancy			Total 1 year (out of 4 years)	Savings w/ EV's (1 out of 4 years) (Note: does not include chargers)	Small segment	Medium segment			
		Simple (10 cars)	Medium (20 cars)	Complex (100 cars)							
2135 €	2700 €			7 080 €	10 997 €	4 234 €			1 439 €	56 729 €	60 647 €
2135 €	2700 €			7 080 €	17 934 €		6 620 €		1 172 €	77 915 €	88 769 €
2135 €	2700 €			7 080 €	58 094 €			15 759 €	1 506 €	172 650 €	223 665 €
2135 €		5500 €		12 049 €	21 995 €	4 234 €			1 439 €	113 458 €	123 404 €
2135 €		5500 €		12 049 €	35 868 €		6 620 €		1 172 €	155 830 €	179 648 €
2135 €		5500 €		12 049 €	116 188 €			15 759 €	1 506 €	345 301 €	449 440 €
2135 €			10600 €	56 021 €	109 974 €	4 234 €			1 439 €	567 291 €	621 243 €
2135 €			10600 €	56 021 €	179 340 €		6 620 €		1 172 €	779 149 €	902 467 €
2135 €			10600 €	56 021 €	580 941 €			15 759 €	1 506 €	1 726 504 €	2 251 423 €

Note (section 9.2 Price group report):

(1) Value of the Performance Differential

(1.1) **Chargers** (rented floor 22kWh): price for 4-year of contracts is 8,539€/un → for 1-year is 2,135€/un (8,539€/un/4)

(1.2) **Consultancy**: simple (2,700€), medium (5,500€) and complex (10,600€)

(1.3) **Subtotal** = Chargers × n + Consultancy/4 → Consultancy payments are spread over the 4 years of the contract; thus, they need to be divided by 4 in order to calculate the annual value.

→ n is the number of chargers defined for each type of consultancy and company profile (simple: 10 EVs, 3 chargers; medium: 20 EVs, 5 chargers; complex: 100 EVs, 25 chargers):

1st option: 10 cars, 3 chargers | 2nd option: 10 EVs, 3 chargers | 3rd option: 10 EVs, 3 chargers |
4th option: 20 EVs, 5 chargers | 5th option: 20 EVs, 5 chargers | 6th option: 20 EVs, 5 chargers |
7th option: 100 EVs, 25 chargers | 8th option: 100 EVs, 25 chargers | 9th option: 100 EVs, 25 chargers

e.g.: 1st option (simple consultancy & small car segment): $2,135 \times 3 + 2,700/4 = 7,079.49\text{€}$

(1.4) **Savings**: Annual Savings × n'; n' is the number of cars for each type of consultancy project.

→ Annual Savings: calculated according with **Appendix 6 - section TCO Savings – Annual Consumption Savings**, for instance:

- 1st option: 10 Nissan Leaf vs Ford Focus ($10 \times 1,099.74\text{€} = 10,997\text{€}$)
- 2nd option: 10 Renault ZOE vs Renault Clio ($10 \times 1,793.39\text{€} = 17,934\text{€}$)
- 3rd option: 10 Tesla Model S vs Audi A7 Sportback ($10 \times 5,809.40\text{€} = 58,094\text{€}$)

(2) Next Best Alternative:

(2.1) **ICEs Annual Rent** (diesel annual rent): calculated according to the rents of diesel cars presented in **Appendix 6 - section TCO Analysis**.

e.g.: Ford Focus (small car segment) = $353\text{€} \times 12 = 4,233\text{€}$; Renault Clio (medium) = $552\text{€} \times 12 = 6,620\text{€}$; Audi A7 Sportback (premium) = $1,313\text{€} \times 12 = 15,759\text{€}$

(2.2) **Cost of Fuel Consumption**: according with annual consumption of diesel cars presented in **Appendix 6 - section TCO Analysis**.

e.g.: Ford Focus (small car segment) = 1,439€; Renault Clio (medium car segment) = 1,172€; Audi A7 Sportback (premium car segment) = 1,506€

(2.3) **Total**: ICEs Annual rent × n' + Fuel Consumption × n'; n' is the number of cars for each type of consultancy project (simple: 10 cars; medium: 20 cars; complex: 100 cars). e.g.: 1st Option (simple consultancy & small car segment) = $4,233\text{€} \times 10 + 1,439\text{€} \times 10 = 56,729\text{€}$

(3) **Total** = Total Next Best Alternative (2.3) + TCO Savings (1.4) – EDP Frota Verde offering (1.3) = (ICEs Annual Rent + Annual Fuel Consumption) × n' + TCO Savings × n' – Chargers × n – Consultancy/4

e.g.: 1st Option (simple consultancy & small car segment) = $56,729\text{€} + 10,997\text{€} - 7,079.49\text{€} = 60,647\text{€}$.

PV Overall Calculation

PV: Value of Performance Differential (TCO Savings - *EDP Frota Verde* offering) + Next Best Alternative (ICEs Rent + cost of fuel consumption)

PV	Value Performance Differential					Next Best Alternative					Total PV (1 year out of 4)	
	Negative				Positive	ICEs Rent (annual spending) (w/ IVA)			Cost of Fuel Consumption	Total 1 year (out of 4 years)		
	Charging 22kW Floor Rent (annual rent) --> 15% profit margin + 6% rent margin	Consultancy			Total 1 year (out of 4 years)	Savings w/ EV's (1 out of 4 years) --> does not include chargers	Small segment	Medium segment				Premium segment
	Simple (10 cars)	Medium (20 cars)	Complex (100 cars)									
	1902 €	2290 €			6 280 €	10 000 €	4 234 €			700 €	49 335 €	53 055 €
	1902 €	2290 €			6 280 €	15 000 €		6 620 €		900 €	75 199 €	83 919 €
	1902 €	2290 €			6 280 €	55 000 €			15 759 €	1 100 €	168 587 €	217 307 €
	1902 €		4730 €		10 694 €	20 000 €	4 234 €			700 €	98 670 €	107 975 €
	1902 €		4730 €		10 694 €	30 000 €		6 620 €		900 €	150 397 €	169 703 €
	1902 €		4730 €		10 694 €	110 000 €			15 759 €	1 100 €	337 173 €	436 479 €
	1902 €			9110 €	49 837 €	100 000 €	4 234 €			700 €	493 348 €	543 511 €
	1902 €			9110 €	49 837 €	150 000 €		6 619,86		900 €	751 986 €	852 149 €
	1902 €			9110 €	49 837 €	550 000 €			15 759 €	1 100 €	1 685 866 €	2 186 029 €

Perceived Value (PV) – Auxiliar Calculation

PV Consultancy	
Price per day	680 €
Price per hour	85 €

PV Consultancy per Project, according to complexity			
	Price men- hours	GPS Tracking	Total Price
Simple (10 cars, 3 days, 24 hours)	2 040 €	250 €	2 290 €
Medium (20 cars, 6 days, 48 hours)	4 080 €	650 €	4 730 €
Complex (100 cars, 12 days, 96 hours)	8 160 €	950 €	9 110 €

PV Charging Stations (Rent)				
	Floor		Wallbox	
	11 kW	22 kW	11 Kw	22 kW
Charging Stations Price + Services	7 359 €	7 610 €	5 175 €	5 325 €
rent per month	153 €	159 €	108 €	111 €
rent per year	1 840 €	1 902 €	1 294 €	1 331 €

Rent Price - Charging Stations (Rent)	Floor		Wallbox	
	11 kW	22 kW	11 kW	22 kW
Margin 15%	15%	15%	15%	15%
Margin €	1038 €	1073 €	730 €	751 €
Price 1	6 918 €	7 153 €	4 865 €	5 006 €
Margin renting 6%	6%	6%	6%	6%
Margin renting €	442 €	457 €	311 €	320 €
Price incl. margin renting €	7 359 €	7 610 €	5 175 €	5 325 €
Rent per month	153 €	159 €	108 €	111 €
Rent per year	1 840 €	1 902 €	1 294 €	1 331 €

Car Segment	Small (Nissan Leaf vs. Ford Focus)	Medium (Renault ZOE vs. Renault Clio)	Premium (Tesla Model S vs. Audi A7 Sportback)
TCO Savings w/ EVs	1 000 €	1 500 €	5 500 €
ICE Fuel Consumption	700 €	900 €	1 100 €

Note (section 9.2 Price group report):

PV = Value of Performance Differential (TCO Savings - *EDP Frota Verde* offering) + Next Best Alternative (ICEs Rent + cost of fuel consumption)

Same assumptions regarding consultancy complexity and car segments as for the TEV calculation.

(1) Value of the Performance Differential:

(1.1) **Chargers** (rented floor 22kWh): The expected price is lower than the one presented in the TEV, assuming a profit margin of 15% (instead of 20%) and a renting

margin of 6% (instead of 11%). The price for the 4 years of the contract is 7,610€/un → for 1 year it is 1,902€/un.

(1.2) **Consultancy price:** The expected consultancy price is lower than the one presented in the TEV, assumed to be 680€ per consultancy day (instead of 800€/day) → simple (2,290€), medium (4,730€) and complex (9,110€)

(1.3) **Subtotal** = Chargers × n + Consultancy/4 → e.g.: 1st Option (simple consultancy & small car segment): 1,902€ × 3 + 2,290€/4 = 6,280€ → Consultancy payments are spread over the 4 years of the contract; thus, they need to be divided by 4 in order to calculate the annual value.

→ n is the number of chargers defined for each type of consultancy (simple: 10 EVs, 3 chargers; medium: 20 EVs, 5 chargers; complex: 100 EVs, 25 chargers):

(1.4) **Savings:** Annual Savings × n' ; n' is the number of cars for each type of consultancy project → Annual Savings: lower assumed expected savings than the ones presented in the TEV (which were calculated according with **Appendix 6 - section TCO Savings – Annual Consumption Savings**), for instance: Small car segment saves 1,000€/year/car (instead of 1,100€), Medium car segment saves 1,500€/year/car (instead of 1,793€), Premium car segment saves 5,500€/year/car (instead of 5,809€). For instance:

- 1st option: 10 Nissan Leaf vs Ford Focus (10 × 1,000€ = 10,000€)
- 2nd option: 10 Renault ZOE vs Renault Clio (10 × 1,500€ = 15,000€)
- 3rd option: 10 Tesla Model S vs Audi A7 Sportback (10 × 5,500€ = 55,000€)

(2) Next Best Alternative:

(2.1) **ICEs' Annual Rent** (diesel annual rent): calculated according to rents of diesel cars presented in **Appendix 6 - section TCO Analysis** (the same used for the TEV), e.g.: Ford Focus (small car segment) = 353€ × 12 = 4,233€; Renault Clio (medium car segment) = 552€ × 12 = 6,620€; Audi A7 Sportback (premium car segment) = 1,313€ × 12 = 15,759€

(2.2) **Cost of Fuel Consumption:** expected to be lower than the one presented in the TEV (which was presented in **Appendix 6 - section TCO Analysis**) → Small car segment saves 700€/year/car (instead of 1,439€), medium saves 900€/year/car (instead of 1,1752€), and premium saves 1,100€/year/car (instead of 1,506€).

(2.3) Total: ICEs Annual rent × n' + Fuel Consumption × n' ; n' is the number of cars for each type of consultancy project (simple: 10 cars; medium: 20 cars; complex: 100 cars). e.g.: 1st Option (simple consultancy & small car segment) = 4,233€ × 10 + 700€ × 10 = 49,335€

(3) **Total** = Total Next Best Alternative (2.3) + TCO Savings (1.4) – *EDP Frota Verde* offering (1.3) = (ICEs Annual Rent + Annual Fuel Consumption) × n' + TCO Savings × n' – Chargers × n – Consultancy/4 → e.g.: 1st Option (simple consultancy & small car segment) = 49,335€ + 10,000€ - 6,280€ = 53,055 €

Costs	Costs Charging 22kW Floor Rent (1y out of 4 years)	Costs (Total 1year out of 4 years)
	1 520 €	4 560 €
	1 520 €	4 560 €
	1 520 €	4 560 €
	1 520 €	7 600 €
	1 520 €	7 600 €
	1 520 €	7 600 €
	1 520 €	38 000 €
	1 520 €	38 000 €
	1 520 €	38 000 €

Note: The costs of 1,520€/un take in consideration the charging costs for renting for 1-year of contract (which means cost of hardware, cost of installation & transportation and cost of operation, that will be explained in **Appendices 9&10**. The total refers to one year according with consultancy complexity that takes into account the ratio of one charger for 4 EVs (Simple: 3 chargers → 1,520€/un × 3 = 4,560€, Medium: 5 chargers → 1,520€/un × 5 = 7,600€, Complex: 25 chargers → 1,520€/un × 25 = 38,000€). (section 9.2 Price group report)

Source: Author's Creation according to Dolan and Gourville (2014)

Appendix 8 – Consultancy Costs

Consultancy Costs

Costs Consultancy	per hour	per day	per month	tax
Salary	19.89 €/h	159.09 €/day	3 500 €/month	-
Insurance (1.00%)	0.20 €/h	1.59 €/day	35.00 €/month	1.00%
Social Security (23.75%)	4.72 €/h	37.78 €/day	831.25 €/month	23.75%
Food Allowance		7.23 €/day		
Transportation cost		50 €/day		
Total		255.70 €/day		

Note: Consultancy costs includes:

- Salary, according to EDP 2016 Annual Report and EDP “Relatório Social 2016” (EDP 2016a&b) (159.09€/day)
- Insurance, according to average of company's insurance to employees (Saldo Positivo 2014) (1.59€/day)
- Social Security tax for companies of 23.75% (Segurança Social 2017) (37.78€/day)
- Food Allowance, according to the maximum level of tickets of food allowance not taxable (Ordem dos Contabilistas Certificados 2016). (7.23€/day)
- Transportation Cost, according to market average. (50€/day)
- Consultancy total costs = 159.09 + 1.59 + 37.78 + 7.23 + 50 = 255.70€/day

Consultancy – GPS cost

GPS Tracking	
GPS Cost	80 €/un

Source: Authors' Own Creation

Appendix 9 – Charging Stations (Buy) COGS (per unit)

COGS Charging Stations (Buy)	Floor		Wallbox	
	11 kW	22 kW	11 kW	22 kW
Cost of hardware	3 390 €	3 590 €	1 645 €	1 765 €
Installation & Transportation	250 €	250 €	250 €	250 €
Total	3 640 €	3 840 €	1 895 €	2 015 €

Note: Charging Stations buying includes cost of hardware (depending on each type of charger) and cost of installation and transportation (250€/un).

Source: Author's Creation

Appendix 10 – Charging Stations (Rent) Costs (per unit, for 4-years contract)

Costs Charging Stations (Rent)	Floor		Wallbox	
	11 kW	22 kW	11 kW	22 kW
Cost of hardware	3 390 €	3 590 €	1 645 €	1 765 €
Installation & Transportation	250 €	250 €	250 €	250 €
Cost for operation	2 240 €	2 240 €	2 240 €	2 240 €
Costs Total (4 years)	5 880 €	6 080 €	4 135 €	4 255 €
Costs per month (4 years)	123 €	127 €	86 €	89 €
Costs per year (1 out of 4 years)	1 470 €	1 520 €	1 034 €	1 064 €

Note: Charging Stations renting includes cost of hardware (depending on each type of charger) and cost of installation and transportation (250€/un), and cost for operation (560€/un/year)

Source: Author's Creation

Appendix 11 – Charging Services (per unit)

Price Charging Services	
Costs	560 €
Profit Margin %	20%
Charging Services Price	700 €

Note: The costs for charging services were defined according to a market average (560€/un/year). This includes: cost of operation, cost of maintenance, equipment and responsibility insurance. → Price defined according to a profit margin according to EDPC: $560 / (1 - 20\%) = 700€$

Source: Author's Creation

Appendix 12 – Consultancy Price

Consultancy Price per day

Price Consultancy	
Consultancy Price (per day)	800 €/day
Costs (per day)	255.70 €/day

Note: Please see **Appendix 8** for further explanation of Consultancy Costs. This includes: salary per day, cost of insurance per day, social security cost per day, food allowance per day, and transportation costs per day.

Consultancy Price per Complexity per day

Price Consultancy - Complexity	Nr cars	hours	Days	Price per men-hours	GPS Tracking	Total Price
Simple	10 un.	24 h	3 days	2 400 €	300 €	2 700 €
Medium	20 un.	48 h	6 days	4 800 €	700 €	5 500 €
Complex	100 un.	96 h	12 days	9 600 €	1 000 €	10 600 €

Note: Simple ($800\text{€/day} \times 3 \text{ days} = 2,400\text{€} \rightarrow 2,400\text{€} + 300\text{€} = 2,700\text{€}$), Medium ($800\text{€/day} \times 6 \text{ days} = 4,800\text{€} \rightarrow 4,800\text{€} + 700\text{€} = 5,500\text{€}$), Complex ($800\text{€/day} \times 12 \text{ days} = 9,600\text{€} \rightarrow 9,600\text{€} + 1,000\text{€} = 10,600\text{€}$)

Source: Author's Creation

Appendix 13 – Charging Stations (Buy) Price

Price - Charging Stations (Buy)	Floor		Wallbox	
	11 kW	22 kW	11 kW	22 kW
Charging Stations Price	4 550 €	4 800 €	2 369 €	2 519 €
COGS	3 640 €	3 840 €	1 895 €	2 015 €
Profit	910 €	960 €	474 €	504 €
Profit Margin %	20%	20%	20%	20%

Note: Costs of hardware were defined according to EDPC and the market average. In order to get the price, a profit margin of 20% (according to EDPC) was applied. E.g.: Charger floor 22kWh \rightarrow Cost of hardware = 3,590€ \rightarrow Total COGS (cost of hardware + cost of installation & transportation of 250€/un) = 3,590 + 250 = 3,840 \rightarrow Price = $\frac{3,840}{(1-20\%)}$ = 4,800€.

Source: Author's Creation

Appendix 14 – Charging Stations (Rent) Price

Charging Stations (Rent) Price (per unit, for 4-years contract)

Price - Charging Stations (Rent)	Floor		Wallbox	
	11 kW	22 kW	11 kW	22 kW
Charging Stations Price + Services	8 258 €	8 539 €	5 808 €	5 976 €
rent per month	172 €	178 €	121 €	125 €
rent per year	2 065 €	2 135 €	1 452 €	1 494 €
Costs	5 880 €	6 080 €	4 135 €	4 255 €
Costs per month	123 €	127 €	86 €	89 €
Costs per year	1 470 €	1 520 €	1 034 €	1 064 €

Charging Stations (Rent) Price Calculation (per unit, for 4-years contract)

Rent price Charging Stations (Rent)	Floor		Wallbox	
	11 kW	22 kW	11 kW	22 kW
Margin 20%	20%	20%	20%	20%
Margin €	1470 €	1520 €	1034 €	1064 €
Price 1	7 350 €	7 600 €	5 169 €	5 319 €
Margin renting 11%	11%	11%	11%	11%
Margin renting €	908 €	939 €	639 €	657 €
Price incl. margin renting	8 258 €	8 539 €	5 808 €	5 976 €
Rent per month	172 €	178 €	121 €	125 €
Rent per year	2 065 €	2 135 €	1 452 €	1 494 €

Note: Costs of hardware were defined according to EDPC and market average. In order to get the price, a profit margin of 20% (according to EDPC) was applied.

e.g.: Charger floor 22kWh → Cost of hardware = 3,590€ → Total COGS (cost of hardware + cost of installation & transportation of 250€/un + cost of operation of 560€/un/year) = 3,590 + 250 + 560 × 4 years = 6,080 → Price = $\frac{6,080}{(1-20\%)} = 7,600\text{€}$.

Moreover, an extra margin for the renting of 11% according to the market average, was applied in order for the charging price for renting to be higher than the one presented in the buying option. E.g.: $\frac{7,600}{(1-11\%)} = 8,539\text{€/un}$ per 4-year contract → 2,135€/un for 1 year

Source: Authors' Own Creation

Appendix 15 – Pricing Formulas

Variables

Variables	Price
Consultancy (per hour)	c
Consultant price per hour	c'
Hours	h
Technology	t
Material	m
Charger - buy	b
Charger - rent	r
Service (operation of the chargers)	s
EVs	e
Chargers after 4 years	p
Costs of installation & transportation	i
Costs of operation	o

Pricing Formulas:

Equation 2 – Price of Bundling Product and Services: Consultancy, Chargers (Buy), and others: $P(1) = c + b + s + e \times M$

Equation 3 – Price of Bundling Product and Services: Consultancy, Chargers (Rent), and others: $P(2) = c + r + e \times M$

Equation 4 – Consultancy Price Calculation: $C = h \times c + t + m$

Source: Author's Creation

Appendix 16 – Distribution Channel: Chargers (Buy)

Distribution Channel - Chargers (buy)					
Unit Variable Cost		2373 €	2513 €	1152 €	1236€
Manufacturer (Chargers)	Unit Margin	1017 €	1077 €	494 €	530 €
	% Margin	30%	30%	30%	30%
	Selling Price	3 390 €	3 590 €	1 645 €	1 765 €
Retailer (EDP)	Unit Margin	910 €	960 €	473,75 €	504 €
	% Margin	20%	20%	20%	20%
	Selling Price	4 550 €	4 800 €	2 369 €	2 519 €
Consumer (Companies)					
<i>Unit = per 1 year</i>					

Source: Author's Creation according to Dolan and Gourville 2014

Appendix 17 – Distribution Channel: Chargers (Rent)

Distribution Channel - Chargers (rent)					
Unit Variable Cost		2373 €	2513 €	1152 €	1236 €
Manufacturer (Chargers)	Unit Margin	1017 €	1077 €	494 €	530 €
	% Margin	30%	30%	30%	30%
	Selling Price	3 390 €	3 590 €	1 645 €	1 765 €
Retailer (EDP)	Unit Margin	2560 €	2647 €	1800 €	1853 €
	% Margin	31%	31%	31%	31%
	Selling Price	8 258 €	8 539 €	5 808 €	5 976 €
Consumer (Companies)					
<i>Unit = per 4years</i>					

Source: Author's Creation according to Dolan and Gourville 2014

Appendix 18 – Distribution Channel: Charging Services

Distribution Channel - Charging Services		
Unit Variable Cost		392 €
Manufacturer (Chargers)	Unit Margin	168 €
	% Margin	30%
	Selling Price	560 €
Retailer (EDP)	Unit Margin	140 €
	% Margin	20%
	Selling Price	700 €
Consumer (Companies)		
<i>Unit = per 4years</i>		

Source: Author's Creation according to Dolan and Gourville 2014

Appendix 19 – Breakeven Analysis: Consultancy (per day)

	Consultancy
Fixed Costs per unit	199 €/day
Consultancy cost per day	159 €/day
Social Security	37.78 €/day
Insurance	1,7 €/day
Variable Costs per unit	57 €/day
Cost of transportation	50 €/day
Cost of food	7,2 €/day
Selling Price per unit	800 €/day
Contribution Margin	743 €/day
Break-Even point	0.27

Unit = 1 day of work (8h)

Note: The unit is defined as one day of work, which means eight hours, the fixed costs are 198 €/day, which includes consultant costs per day of work (159 €/day, using 22 days of work in one month, and since the salary defined for a consultant is 3,500€) and costs for the company, for instance social security 23.75% and insurance of 1%; the variable costs are 57 €/day, which includes costs of transportation (defined as 50 €/day) and food allowance (defined as 7.23 €/day); and the selling unit price is 800€/day. So, the break-even point achieved is 0.27, which means, *EDP Frota Verde* need to sell 0.27 of one day of work (stands as two hours and sixteen minutes of one day of work of eight hours), unit approximately one day of consultancy, in order to get profit for one single day of a consultant expert.

Source: Author's Creation according to Dolan and Gourville 2014

Appendix 20 – Breakeven Charging Stations (Buy) (per unit)

	Charger Floor < 22kW (buy)	Charger Floor 22kW (buy)	Charger Wallbox < 22kW (buy)	Charger Wallbox 22kW (buy)
Fixed Costs per unit	0 €	0 €	0 €	0 €
Variable Costs per unit	3698 €	3898 €	1953 €	2073 €
Cost of installation & transportation	250 €	250 €	250 €	250 €
Cost of operation (maintenance & insurance equipment)	58 €	58 €	58 €	58 €
Cost of hardware	3390 €	3590 €	1645€	1765 €
Selling Price per unit	4550 €	4800 €	2369 €	2519 €
Contribution Margin	852 €	902 €	415 €	445 €
Break-Even point	0	0	0	0

Unit = per Charging Station

Note: Regarding charging stations, for both purchasing methods (buying and renting), there is no break-even since there are no fixed costs for this offering only variable costs, being the unit defined as per charging station.

Source: Author's Creation according to Dolan and Gourville 2014

Appendix 21 – Breakeven Charging Stations (Rent) (per unit)

	Charger Floor < 22kW (rent)	Charger Floor 22kW (rent)	Charger Wallbox < 22kW (rent)	Charger Wallbox 22kW (rent)
Fixed Costs per unit	0 €	0 €	0 €	0 €
Variable Costs per unit	3390 €	3590 €	1645 €	1765 €
Cost of hardware	3390 €	3590 €	1645 €	1765 €
Selling Price per unit	8258 €	8539 €	5808 €	5976 €
Contribution Margin	4868 €	4949 €	4163 €	4211 €
Break-Even point	0	0	0	0

Unit = per Charging Station

Source: Author's Creation according to Dolan and Gourville 2014

Appendix 22 – Breakeven Charging Services (per unit)

	Charging Service
Fixed Costs per unit	560 €
Variable Costs per unit	0 €
Selling Price per unit	700 €
Contribution Margin	700 €
Break-Even point	0.80

Unit = 1 charging station

Note: However, for the charging services, there is only fixed costs of 560 €, and since the selling unit price is 700€, the break-even point is 0.80, which means, this service only be profitable after selling unit, approximately one unit.

Source: Author's Creation according to Dolan and Gourville 2014