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“DEVELOPMENT A MARKETING PLAN FOR A NEW BUSINESS MODEL FOR EDP COMERCIAL or HOW CAN EDP BE THE UBER AND NOT THE TAXI DRIVER”

Ana Beatriz Gonçalves Dias | 2519
Bárbara Ruivo Tavares | 2609
Carolina Pereira Lima Tomás Lourenço | 2552
Francesco Fanelli | 3027
Nina Rita Coelho Do Amaral Sodagar | 2584

A Project carried out on the Master in Management Program, under the supervision of:

Professor Jorge Velosa

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Abstract
The energy market in Portugal has undergone severe changes currently, with liberalization and consumer empowerment changing the competitive landscape. Currently the market leader, EDP Comercial is in need to innovate constantly and find new profitable opportunities in the market to sustain its position and capture new emerging trends in the market, like renewable energy. This report carefully analyses ways to monetize opportunities regarding renewable energy sources. As the result from extensive marketing analysis, a complete marketing and communications plan was developed for edp + solar, a revolutionizing rental based model that allows everyone to have access to solar energy.

Keywords: EDP Comercial; marketing plan; renewables; sharing energy solutions
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Executive Summary

The electricity market liberalization has abruptly changed this industry by empowering customers and intensifying the competition. Electricity companies face now high switching behaviour once the switching costs are almost non-existent. Therefore, being ahead on innovation was never as important in this market as it is now and they are increasingly looking for new products/services and new business models that might allow them to sustain and grow their business.

This is why EDP Comercial, the Portuguese electricity market leader, plans to invest in new ideas that can differentiate itself from its competitors and revolutionize the entire electricity market, not only nationally but internationally.

This report carefully analyses different and new ways to monetize the electricity market and why or why not customers adopt renewable energy sources. As a result from the analysis, which includes a discussion of the primary and secondary research that were performed, a complete marketing and communications plan was developed for the possible new business model, edp + solar. This new business model consists on the services of renting solar panels, both in single houses and in apartment buildings.
1. Situation Analysis - Market Overview

1.1. Liberalisation process

The electricity market’s liberalisation initiative started to be implemented in 1996 with the promulgation of Directives from the European Union. This process started in Portugal in 2007, since then allowing all customers to shift to the liberalised market, and its conclusion (complete liberalisation) is expected in the end of 2017.

The liberalisation process has changed permanently the market structure of many European countries, increasing the number of players within the sector and the competitive scope and degree of rivalry. This increase in competition results in a wide variety of energy solutions, different in terms of price and innovation. Moreover, this market transformation resulted in a major empowerment of the European consumers, who now have a higher bargaining power, increasing their possibility to switch both internally (within a supplier) and externally (from one company to another) due to non-existent switching costs. This lack of cost leads to higher switching rates in countries with markets that have been liberalised for longer, with Portugal being an outlier regarding electricity. This positive relationship can be explained by the fact that consumers often need time to become aware of new conditions, including possible savings and switching processes (ACER/CEER, 2015). In 2015, an increase of 18% can be noticed in the Portuguese liberalised market in terms of number of customers (39% increase considering the domestic segment) and a switching rate of 27% (37% of those switches within the liberalised market). While the market growth can be an opportunity, the increasing switching behaviour is an imminent threat to EDP Comercial’s current position.

To fight this threat, companies are increasingly looking for new products/services that allow them to hold/grow their stance by retaining and acquiring customers. Being ahead on innovation was never as important as it is now and it is the reason why EDP Comercial is

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1 From here on after mentioned as EDP.
investing in new ideas that can differentiate itself and revolutionize the entire electricity market.

1.2. Energy demand and consumption

In 2014, EU-28 demand for electricity by domestic consumers was 2 870 TWh in total, which represented 3.1% less than in 2013. This is the first significant fall in electricity demand since 2009. This demand decline can be explained by the warmer 2014-15 winter and the implementation of energy efficiency measures in some countries. The level of household electricity consumption shows significant differences between European countries, due to climate and socio-economic factors. In 2014, 6 017 870 Portuguese households consumed 18 TWh of electricity, registering an average of 2 996 kWh/household. Comparably, the average European annual electricity household consumption was 3 403 kWh (ACER/CEER, 2015).

1.3. Retail prices

In Europe, the 2014 household post-tax prices (POTPs) for electricity showed an increase of 2.6% in comparison to 2013, reaching an average of 20.56 euro cents/kWh, while the average pre-tax prices were 13.97 euro cents/kWh. Portugal had a POTP for electricity households of 22.93 euro cents/kWh, aligned with the mentioned European average (ACER/CEER, 2015).

1.3.1. Price developments

In order to better understand the price developments, it is important to first comprehend its break-down. POTP is the sum of the price of the energy component\(^2\) plus non-contestable charges, which are: network charges\(^3\), taxes, VAT and RES charges\(^4\).

To varying degrees in a number of countries, including Portugal, the fall in the energy component of the final price has been offset by the growth of non-contestable charges. This can be said to reflect long-term national policy objectives or regulatory price-setting

\(^2\) Energy component includes the price charged for: generation (excluding capacity charges for generation adequacy), aggregation, balancing energy, customer services, after-sales management, other supply costs and retail margin.

\(^3\) Network charges include prices for: transmission and distribution costs (including losses), system operation costs (excluding balancing energy) metering and meter rental.

\(^4\) RES charges can be defined as subsidies that are covering investments in renewable energy sources.
interventions. In fact, Portugal experienced a year-on-year growth (from 2013 to 2014) on the final price of 4%, despite the 2% fall in the energy component price. Furthermore, using the compounded annual growth rate of the electricity POTP from 2008 to 2014, it is possible to notice that Portugal experienced a 6.5% growth rate in the electricity final price, but just 0.1% increase in the energy component price.

In Portugal, network charges decreased the most (8% annually from 2012 to 2014), due to the reduction in some of the policy costs. Additionally, RES charges have been increasing steeply between in the same period due to the large amount of renewable energy produced and consequent costs. However, due to this production increase electricity wholesale prices have been lowered (ACER/CEER, 2016).

1.4. Market Future Trends

According to the latest available data, in August 2016, the Portuguese inflation rate was 0.7%, being forecasted to grow to 0.84% in 12 months time. In the long-run, it is predicted to trend around 1.80% in 2020. (Tradingeconomics.com, 2016).

The Portuguese economy expanded 0.3% on the quarter in the three months to June 2016, compared to a 0.2% growth in the previous period, therefore exceeding preliminary estimates of 0.2%. Following the forecast for 2017, it is predicted to reach 0.5 % on the third quarter after a slight decrease on the first one (0.2%). Taking into account a long-term perspective, it is aimed to stabilize in 0.4% growth in 2020 (Trading Economics, 2016).

The electricity price in Portugal has increased 2.9% in real terms (second semester of 2015 compared to first semester of 2016) (exhibit 1). Also, the revenues from electricity trade are expected to slow down, predicted to have a sudden growth from 2019 to 2020 (exhibit 2).

Regarding the proportion of energy derived from renewable sources in Portugal, within the period from 2004 to 2014, a growht was registered, reaching 27% in 2014 (exhibit 3), which is forecasted to follow the growing trend.
This expected economic evolution around the electricity market can be justified by the drastic changes in this sector boosted by its liberalisation and technology innovation. Moreover, a few marketing trends can be mentioned, having direct impact in the utilities sector. The current digital fever, seen by the increasing number of internet users and the mobile connectivity anytime, anywhere highly influences the nature of consumer engagement across the customer life cycle. In fact, consumers are now more independent and demanding, increasing their bargaining power towards companies, that now need to learn how to adapt. Aligned with the new consumer role, there is the growth of innovative business models implementation, built on collaborative consumption and resource sharing and based on digital platforms, contributing to a redistribution of value by the companies and even generating new value creation opportunities (DCMK, Marketing Trends, 2016).

2. Five Cs Analysis

2.1. Company

In 2006, EDP Comercial entered the market operating under the holding company Energias de Portugal, established in 1976 in Portugal. This holding went through a privatisation process that started in June of 1997 ending in 2011 with the purchase of the final state stocks by the chinese company Three Gorges. Currently it globally employs 12 084 people throughout its different companies, with 6 683 working in Portugal.

As an organization, Energias de Portugal operates in three different sectors: EDP Produção and EDP Renováveis within production of energy; EDP Distribuição assures the delivery of electricity and gas to the customers; and finally, the commercialization and trading of electricity and gas is the responsibility of EDP Comercial and EDP Serviço Universal.

EDP Comercial operates in the liberalised utility market in Portugal in which it has 85% market share amongts domestic consumers (ERSE, June 2016).

Despite leading the liberalised market over the years, taking into account 2015 data, EDP
Comercial’s market share in the Domestic segment has been growing at a slower pace (22%) when compared with the overall liberalised market growth (23%). Even though not extremely critical at this moment, this might reveal a future challenge in order to maintain the strong presence of the company in the liberalised market (exhibit 4).

Aligned with the commitments stated by the company - social and environmental responsibility towards sustainability, rigorous ethics and professional value in people, fulfilment of results commitments, plus listening to and focusing on the customers - an open website provides a closer relationship between the consumers and EDP, with advantages, discounts and a direct line for communication. These commitments come from a set of values the company uses to guide all decisions and interactions. With the vision of being a “global energy company, leader in value creation, innovation and sustainability” (EDP, Relatório e Contas, 2016) the values initiative, trust, excellence, sustainability and innovation are consistent throughout the years.

When it comes to the Commercial and Marketing Department, EDP wants to be the consumer's favorite, to lead the energy market and services in a sustainable fashion that is customer focused and adjusted. These consumers are mainly families and businesses and the company differentiates itself by providing a wide portfolio of solutions, that are reinforced by all the specialized knowledge of the entire group, as well as the commitments and values that rule the mindset and culture of EDP Comercial (DCMK, Visão e Posicionamento, 2016).

2.1.1. SWOT

To better understand EDP, its strengths and weaknesses, as well as possible opportunities and threats that may arise, a SWOT analysis was created:
<table>
<thead>
<tr>
<th><strong>Strengths [S]</strong></th>
<th><strong>Weaknesses [W]</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>- Largest supplier of energy in the Portuguese liberalized market;</td>
<td>- Big company with several internal barriers for approval of new businesses</td>
</tr>
<tr>
<td>- It highly invested in renewable sources of energy;</td>
<td>- Difficulty in data access internally</td>
</tr>
<tr>
<td>- Constantly trying to innovate and better serve their demanding customers.</td>
<td>- One way source of communication with consumers (company does not give relevance to feedback)</td>
</tr>
<tr>
<td>- Positive brand image by consumers</td>
<td>- Difficulty in communicating and retaining consumers that transfer from the regulated to the liberalised market</td>
</tr>
<tr>
<td>- Know-how highly present</td>
<td></td>
</tr>
<tr>
<td>- High level of resources and bargaining power</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Opportunities [O]</strong></th>
<th><strong>Threats [T]</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>- To become the pioneer in the Portuguese market for a new way to sell energy;</td>
<td>- Non-energy focused companies that are breaking the entry barrier on the service side of the business;</td>
</tr>
<tr>
<td>- Explore new consumer trends;</td>
<td>- Scepticism from consumers for an incumbent brand;</td>
</tr>
<tr>
<td>- Portuguese economy is recovering and new generations are craving for different solutions and approaches to the energy retail.</td>
<td>- Environmental laws and new regulations;</td>
</tr>
<tr>
<td>- People prefer comfort over saving light</td>
<td>- Natural conditions may affect drastically the outcomes of the business and impact the materials.</td>
</tr>
<tr>
<td>- Global warming increasing</td>
<td></td>
</tr>
<tr>
<td>- New products and companies coming up with environmentally safe ways of producing energy</td>
<td>- Renewable more accessible to everyone</td>
</tr>
<tr>
<td>- Portugal has a lot of days of sun every year</td>
<td>- Fast moving tech innovations</td>
</tr>
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| **2.1.2. EDP ’s Current Product/Service Offering** |
With a wide array of products and services offered - from different electricity and gas tariffs to some out-of-the-box solutions - EDP is constantly trying to keep up to date in the energy sector including energy management systems such as Re:dy, that allows consumers to remotely control their home appliances while understanding where and when they are spending energy and how to become more efficient. Another service offered by the company
is *Funciona*, which provides technical home assistance. Other individual products such as water pumps and smart plugs are also available for purchase.

Items like solar panels are also commercialized by EDP and the offer varies according to the type of consumer and his household, which is assessed in an online simulator. In this case, bundles are offered to incentivise the market to *go green*. Although most products offered are within the Business to Consumer (B2C) segment - main driver of profits for the company - EDP also has solutions in the Business to Business (B2B) segment (EDP, Website, 2016).

### 2.2. Competitors

Different types of competition may arise as a result of different market structures. The number of suppliers and the market concentration provide an indication of the degree of competition in the Portuguese market.

#### Number of suppliers

In Portugal, there are 15 retail electricity suppliers in the domestic sector namely EDP, Galp, Endesa, Iberdrola, GN Fenosa, Goldenergy and others that supply consumers independently of their geographical location in the country. Furthermore, there are a number of smaller suppliers that offer regionally specific energy solutions to consumers (ERSE, Website, 2016).

Although retail energy markets with a higher number of active nationwide suppliers are seen as more competitive, it is also evident that markets like the Portuguese one have a very strong regional/local component, where competition at local level can be more intensive.

#### Market concentration

The intensity of rivalry in the Portuguese electricity market can be categorized as “low”. Using the $CR_3$ concentration ratio $^5$, it is noticeable that the three largest suppliers in the market (EDP, Galp and Endesa) account for 95% of the market in terms of number of customers. The same result is achieved with data expressed as percentage of electricity

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$^5$ Sum of market shares of the three largest suppliers in a market, and the number of suppliers that have at least 5% of market share.
consumption, since EDP, Iberdrola and Endesa account for a 79% market share (ERSE, June 2016). Usually, $CR_3$ values above 70% and low numbers of main suppliers\(^6\) are indicative of possible competition problems. Given that, it can be said that Portugal is, currently, a high concentrated market resulting in an non-competitive market for new entrants (Eurostat, 2015). EDP is the strongest player in the retail electricity market with 85% of customers, followed by Galp Energia (5.7%), Endesa (3.5%), Iberdrola (3.2%) and the remaining suppliers accounting for 1.5% of the market in of number of consumers. When looking at levels of electricity consumption in the *Domestic Customers* segment, EDP is the major player with a solid 82% market share. Other companies like Galp (5.3%), Iberdrola (4.1%) and Endesa (3%) represent just a small part in this segment (ERSE, June 2016).

### 2.3. Context

#### 2.3.1. Political Environment

The European Union is under a period of political instability across its Member States, with Portugal under government instability since it is still under scrutiny of the European Commission. Moreover, in the public sector perception, the country scored 63 out of 100 in corruption which is a sign on population’s trust on the government (Transparency.org, 2016). Looking at the electricity market within the political sphere, there are several measures in place. An example is the government incentive system to invest in solar panels, where if they are installed as “*stand alones*” in a land registered as “*Other*”, the property tax for that land is cut by 50%. (Pinheiro, 2014). Moreover, in 2009, a set of incentives, such as reduced taxes as well as financial help in panels’ payment were put in place (Ministério das Finanças, 2010). Under Europe 2020 strategy, a growth plan was created in 2010 with objectives aimed to be improved and developed over the following 10 years. The report has very clear and specific targets for all the member states and within the energy/climate scope, greenhouse gas’

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\(^6\) Suppliers that account for more than 5% market share.
emissions should be 20% lower than in 1990; renewable sources must account for 31% of production and energy efficiency should increase by 20%. (European Commission, 2010).

2.3.2. Economic Environment

After a long period of crisis, the Portuguese economy has been recovering for the past years as proven by a constant GDP growth, steady for the past three quarters at 0.2%, as well as the decline of unemployment rate, which was 10.8% in June 2016, versus 11.9% in the same period of last year (Tradingeconomics.com, 2016). Moreover, the minimum wage increased to €557/month in 2017 (Pinto, 2016).

The services sector makes up a large amount of the Portuguese economy, representing nearly 76% of the GVA (Gross Value Added) while the industry, construction, energy and water sector represents 21.9% of the GVA. Furthermore, the overall trade balance for the country’s economy remained positive, due to the increasing amount of services’ exports (AICEP, 2016).

2.3.3. Social Environment

The total population in Portugal was 10.37 million inhabitants in December 2015, and has been decreasing at 5.7% rate in the last two years. This negative trend is expected to persist in the future due to the population aging which according to analysts’ expectations will be of 10.12 Million in 2020 (Tradingeconomics.com, 2016).

When looking at the housing market, 20% of houses were rented according to 2011 Census, registering a growth of 7.3% from 2001. The house rental market is expected to grow in the future due to the increased difficulty to get housing credit solutions, making rents lower than the installments. (INE, 2013). Additionally, the improvement of education performance will positively and directly impact the future consumers, that will be more skilled and apt to use new technologies. (PwC, 2015). Characterized as a collective-centered society, Portuguese consumers may be inclined to take part in community energy projects since it would bring extra shared benefits. (Geert-hofstede, 2016). Following current focus on sustainability issues,
it can be stated that people are now, more than ever, concerned about the sustainability theme. Directly related with the environmental sphere, the increased focus on the global warming and the negative effect of $CO_2$ emissions are currently taken more seriously.

2.3.4. Technological Environment

The technological revolution is happening at the speed of light and several innovative and disruptive projects are being developed and rolled out into the market. Regarding energy specifically, there have been constant improvements in the renewable energy sources with increasing efficiency of solar panels and windmills (Bullis, 2014). Moreover, the Japanese Space Agency has intensively researched on finding a way of wirelessly transmitting solar energy directly from Space, which has already been tested by Mitsubishi (AENews, 2016). Regarding electricity storage, Tesla has developed Powerwall: a battery that stores electricity produced during the day to be used at night (Martin, 2016). Additionally, new ways of getting electricity have been developed as, for example, Solar Power Windows, marketed by Solaria or Solar Window Technologies, which collect energy and are see-through at the same time (Hanley, 2015); or even bridges that collect energy from cars’ movement (AENews, 2009). As a tool to revolutionize marketing and sales, there is an increased importance of Big Data and Customer Analytics, which allow a better understanding of customer insights in order to deliver adequate solutions tailored to customer preferences (Columbus, 2016). Closely related with the technological environment affecting the energetic scope, there is the evidence of a growing emerging trend of sharing platforms (e.g. Uber, Airbnb).

2.3.5. Ecological Environment

As aforementioned, the Europe 2020 plan envisions a 20% increase in energy efficiency. However, global energy use is expected to grow by 56% between 2010 and 2040 with fossil fuels supplying nearly 80% of all energy through 2040 (EIA, 2014). The goal is to reduce this number through the use of sustainable resources which protect the environment, enabling the
pursuit for a sustainable economic growth, inline with the pressure to go greener. According to the European Commission, “energy and environmental objectives go hand in hand”, namely in energy efficiency and use reduction, use of renewable energy sources and other more specific measures. The United Nations climate change conference in Paris in December 2015 (COP21) produced an agreement among 195 countries to act for zero net emissions in the second half of the century. Nevertheless, the global emission trend remains worrying, as energy-related emissions are not forecast to peak until the late 2020s, at the earliest (FS-UNEP, 2016). Despite the efforts to improve energetic performance in alliance with environmental concerns, all forms of energy development have potential negative impacts for example, windmill blades kill a large numbers of bats and birds (Pioneer Press, 2015); solar panels infrastructure take up vast areas of wildlife habitat (Leitner, P. 2009). However renewable energy sources are desirable as they do not contribute to anthropogenic global environmental change. In fact, according to Francesco Venturini, CEO of Enel Green Power, environmental concerns and the price volatility of primary energies are pushing governments to rely more and more on the renewable technologies as they are becoming more competitive and their costs are reducing as a steady price (PwC, 2015).

2.3.6. Legal Environment

Electricity prices in the regulated market are defined and supervised by Entidade Reguladora dos Serviços Energéticos (ERSE). Regarding in house production of solar energy, it should be used to fulfil the house electricity needs, with just the surplus inserted into the Public Service Electric Grid the excess of energy produced (Laws regarding energy sector). Initially, all the energy produced from photovoltaic\(^7\) solar panels was directly sold to the Public Service Electric Grid\(^8\), at a pre-defined tariff. Moreover, within the general regime (until 5.75kW), the reference selling rate for micro producers (for all kinds of renewable energy production)

\(^7\) Photovoltaic solar panels are solar panels that convert solar energy into electricity

\(^8\) From here on after referred to as grid
equals the energy tariff cost applied by the supplier regarding consumption installation. The subsidized regime states that the reference rate for 2016 is € 0.095/kWh. For categories II and III\(^9\), it grows to €0.105/kWh and €0.10/kWh, respectively (Laws regarding energy sector).

Still within self-production and use, there are a number of restrictions that should be taken into account. As examples, the units of small production may only be connected to the grid with a power equal or inferior to 1.5kW and a self-use unit with a power equal or inferior to 200 W does not need a registration to be installed (Quercus, 2015). Additionally regarding the legal sphere, the installation of thermoelectric\(^{10}\) solar panels in every new or renovated building that gathers all the necessary conditions became mandatory, according to the RCCTE\(^{11}\) revision in 2006\(^{12}\). The measure aims to give incentives to the solar energy use growth in Portugal, being along with energetic efficiency and interior air quality.

### 2.4. Collaborators

Collaborators can be defined as entities that work with the company but are not an integral part of it. They can either be downstream or upstream members of EDP’s value chain. Fuel procurement, construction of energetic facilities, purchase and maintenance of equipment and the hiring of services related to distribution and commercial activities of energy are the significant purchase categories that define the fundamental profile of EDP's supply chain.

Taking into account only EDP, EDP Produção and EDP Distribuição can be considered as main upstream collaborators, being effectively the main provider and distributor of electrivity that would then be commercialized.

Regarding downstream collaborators, EDP is undertaking significant partnerships and collaborations with several automobile manufacturers, under the scope of the “Electric Mobility Program” that the company is currently promoting for the BC2 segment. In fact,

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\(9\) Category I: UPP (Unidades de Pequena Produção - Small production units) registration only; Category II: UPP registration and infrastructure installation for electric vehicles charging; Category III: small production units’ registration and installation

\(10\) Thermoelectric solar panels are solar panels that use solar energy to heat water

\(11\) RCCTE - Regulamento das Características de Comportamento Térmico dos Edifícios

\(12\) Decreto Lei nº 80/2006, April 4th
through partnerships with companies like Audi, BMW, Mercedes Benz, Mitsubishi, Toyota and Volkswagen, EDP is able to offer discounts and services (e.g.: electricity provider for the electric cars) in combination with the purchase of one of these brands.

2.5. Customers

The Portuguese electricity market in the B2C sector is made up of 6 067 051 customers as of June 2016, of which 75% have already transitioned to the liberalised market (ERSE, June 2016).

2.5.1. Empowerment through choice and information

Regarding electricity, market liberalization and distribution and installation of smart meters will dictate how the Portuguese market has and is going to behave over the next few years. While the consequences of the liberalisation of the market – which have been previously detailed – have had an effect for some time, the proliferated use of smart meters, which was only first officially recommended by the European Commission in 2012 – is yet to be noticeably large within the Portuguese market (ACER/CEER, 2016). However, companies have started to prepare their approach to this new tool, with regular meters being changed to smart meters throughout entire country\textsuperscript{13}. The installation and use of smart meters will allow both company and, most importantly, customers to keep accurate track of their energy usage and spendings in order to make better informed decisions when choosing suppliers.

2.5.2. Behaviours and influencing factors when using electricity

There are a great deal of factors that influence the electricity consumption within a household and therefore the choice in both supplier and rates/potência contratada\textsuperscript{14} rating within them. Major factors have to do with the type of home, whether it is an apartment or a villa, how many rooms it has and how recent they are. Bigger homes require more energy, while villas may have energy expenses with outdoor lighting and others that apartments do not.

\textsuperscript{13} This process is carried out by the electricity distribution company, which in EDP’s case is EDP Distribuição.

\textsuperscript{14} Potência contratada is the electrical power available in a home. The level of potência contratada influences the number and type of appliances a household can have running at the same time (more potência contratada, more appliances)
Another influencing factor is the amount of appliances and gadgets each home encompasses as well as the need to have every device connected and either always plugged in or fully powered to use, which puts a strain on the energy demand each household currently has. Furthermore, an increasing amount of people are no longer leaving their homes to go to work or have different work schedules than the regular “9 to 5 job”, meaning solutions like *tarifa bi-horária*\(^{15}\) may no longer be so appealing to a large amount of customers. However, consumers in general are more aware of the fact they should be sensible about their energy spendings not only in order to save money at the end of each month but also to take better care of the scarce resources and the environment in general (CLab, 2016).

### 2.5.3. Market Segmentation

Energy companies generally do not segment the domestic energy market based on demographic or psychographic variables, but rather on the *potência instalada* of each customer. The segmentation is done this way because companies attribute a direct link between this indicator and power usage and habits of customers (i.e. higher installed power rating indicates use of more appliances at once or appliances that require a larger amount of electricity).

#### 2.5.3.1. Efficient Segments

Nonetheless, to analyze new market trends studies are conducted to assess how consumers act upon these trends, creating segments based on characteristics used to measure that trend. As aforementioned, consumers have become more aware of the benefits of being more energy efficient. To analyze these behaviors and consumer characteristics a study was conducted and from it segments emerged, mainly separated into two large groups: the “greener” segments and the less efficient segments. The more efficient group represented 59% of the representative sample, meaning that the Portuguese population is generally more energy efficient.

\(^{15}\) A price plan where there are two rates for electricity, a higher one for the daytime usage (7am to midnight on weekdays) and a lower one for the night-time (midnight to 7am on weekdays)
efficient. From the remaining segments encountered, less informed seniors were the smallest consumer group making up 7% of the sample (DCMK, Produtos e Serviços, 2016).

3. Potential Business Models

As first step on the new business model formulation for EDP, a brainstorm session was conducted taking into account all the insights gathered by the research team about new technological developments, market trends and other existing business models all over the world with a special focus on the European and North American markets due to its similarity in terms of market maturity regarding the electricity industry.

3.1. Business Models Presentation

A set of business models were formulated, exploring different types of renewable sources of energy and alternative financing options. For a deeper understanding of the models’ potential, this section should be read together with the analysis of exhibit 5.

The EDP Roofsharing platform would enable a group of customers that want to use solar energy but do not have enough physical capacity (e.g. land, roof) or the most adequate living conditions (e.g. live in an apartment or a rented house) to find people that have the necessary conditions and are willing to install solar panels, thus finding a partner for energy sharing.

Through EDP EnergyCommunity solution, a group of households (living in the same building, condominium or village) would be able to share solar energy by purchasing a set of solar panels. This offer is convenient for a conglomerate of customers that could benefit from a centralised production of energy and consequent reduction on each of their electricity bills.

EDP SolarFund aims to be the first entity that provides alternative financing solutions for customers to be able to adopt solar solutions through leasing and renting options, mitigating potential lack of funds for initial investment. This solution would also increase customer loyalty while making cleaner energy more available to a broader group of potential customers.

Through EDP Home Windmill, EDP would be the first company in Portugal to sell smaller
windmill devices for homes that would provide energy to households, exploiting electricity generation through wind – the most efficient type of energy in terms of cost/production ratio.

**EDP Solar Farm** would have a large set of solar panels implemented in optimal locations for solar energy production throughout the country, offering its consumers the possibility of renting a panel from those farms for their own use. Their electricity bills would be reduced while not having the burden of the upfront investment and having the opportunity to access cleaner energy even if the consumer originally did not have the space to install the panels.

By bringing together people with a sole purpose of financing a specific project through the **EDP Crowdfunding** solution, solar panels would be more attainable by a larger customer pool, that would have the incentive to go green without bearing the total initial costs.

Through the **H₂E** program, a disruptive and extremely innovative technology for in-house electricity production by installing small water turbines inside the common water pipes the consumer would be able to take advantage of another utility (water) to produce electricity and actively reduce his electricity bill, therefore maximizing its value proposition.

**EDP Cool Waste** is a bioenergy solution that uses waste to generate electricity, while getting the population more involved by providing rewards for waste reduction, in the form of coupons for lower electricity bill. In terms of implementation, costs would be decreased as the population offers the raw material for energy production.

**EDP Energy Storage** would commercialize home batteries together with **Energia Solar EDP** panel customer could save their excess energy, making them less dependent on the grid and from the electricity supplier itself, which boosts customer satisfaction.

By taking advantage of Portugal’s richness in natural resources, namely water, turbines could be placed in rivers, generating energy while not disturbing the terrain. The innovative **EDP River Turbines** solution would enable the generation of energy from clean sources while

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16 *Energia Solar EDP*: a service from EDP Comercial that sells and installs photovoltaic solar panels that produce electricity for household consumption therefore reducing the electricity bill while consuming cleaner energy.
providing the opportunity for the domestic consumer to decrease its electricity bill.

When presenting the afore described models to the company in order to evaluate their potential and risk on development and implementation, three of them were immediately discarded: EDP Cool Waste, as it was out of this project’s scope; EDP Energy Storage, that is already being developed by the company; and EDP River Turbines due to rivers being public property making it impossible to implement such project.

3.2. Potential/Risk Matrix

For the assessment of the aforementioned non-discarded business models, a Potential/Risk Matrix was developed in order to identify the models with “Star” quality, meaning, the ones that present the highest potential and the lowest risk.

To place each model within the matrix, different criteria were selected for both potential and risk. For the final assessment, each criterion had different weights related to its relevance for the project implementation than others. In order to reach a final score for each one of the axis, the models were rated from one to five according to the different criteria (exhibit 6).

After this step, it was concluded that the seven models were all placed in the upper-right quadrant when considering the standard value for the axis - the scales midpoint (2,5) -, which can be explained by the high risk commonly associated to strategic moves within the utilities’ industry. This made it impossible to differentiate the business models, so in order to overcome this hurdle, the values of the axis were adjusted to the mean value for Potential (3,4) and for Risk (3,3), which resulted in the matrix found in exhibit 7.

With this adjustment, it was possible to classify the models according to their attractiveness. H2E and EDP Home Windmill were considered as “No Go” due to its high risk and low potential, EDP Solar Fund and EDP SolarFarm.com were labeled as “Question Marks” with high potential and risk, EDP Crowdfunding was marked as “Quick Hit” due to its low risk and potential, and EDP Roofsharing and EDP Energy Community were identified as “Star”.
Even if the main goal of this tool is to identify the last ones (“Star”), at this stage only the first ones (“No Go”) were discarded, so that further research would allow for an understanding of the implications of the other models with Primary Research.

4. Primary Research

4.1. First Qualitative Research: Consumers

4.1.1. Marketing Problem
Assess consumer perceptions regarding renewable sources of energy and understand their current consumption patterns and current image of the electricity market.

4.1.2. Methodology and Questionnaire
The questionnaire (exhibit 8) for these interviews was loosely defined and served a purpose of general guidance for the interviewers in order to allow some freedom and better explore questions where it was felt that more understanding was needed. After filtering the respondents into Users of Renewable and Non-Users of Renewables, two different sets of questions were conducted, the first to better understand the reasons behind adopting these sources of energy (Users of Renewables) and the other to understand the perception and attitudes towards renewables and reasons of not adopting any product. Both groups also gave insights about their energy consumption patterns at home and what care they take with spending energy, and their attitudes about sharing electricity and other services. To better understand the perception of the different electricity brands currently in the market questions about brand recall, recognition and word association were performed. Finally, resorting to a projective technique - only for the Non-Users of Renewable since the Users would describe themselves - there was an attempt to take into consideration some prejudice or set ideas consumers might have about Users of Renewable Energy.

4.1.3. Sample
For the qualitative research 27 in-depth interviews were conducted with consumers that have
lived in Portugal for at least 3 years, so that there was some degree of familiarity with the market. The overall sample was significantly balanced in terms of both gender and age, with 56% of the interviewees being women versus 44% men and with ages ranging from 21 years old to 81. In order to best assess potential differences between types of electricity consumers, the interviews were conducted keeping in mind two different groups - one who did not have any type of renewable sources of energy in their home, and another that had some type of those sources in their current home.

4.1.4. Main findings

Starting from the Non-users of Renewables segment, it can be said that one of the major observations found was that the majority of respondents never thought about adopting renewables in their current house, mainly due to two main motivations: non-property of their current house and a too high investment perception. In fact, when respondents were asked about their knowledge about current prices and available financial options for renewables, mostly all of them perceived that going with renewables is a high investment in terms of costs structure and, moreover, with an extremely high payback period.

On the other hand, the respondents that have thought about a possible adoption of renewables (8 out of 18) mentioned solar energy as the preferred one, as this type of renewable energy is currently seen as the most common and “house-friendly” one in terms of adaptability. Given that, asking for the main drivers for an eventual adoption of a renewable source of energy was the next step of the research. It was discovered that the most considered driver for going with renewables is a direct economic return, expressed in terms of consistent savings on the average monthly bill. Only an extremely small minority (2 people out of 18) considered taking care of the environment as the most valuable driver for a possible adoption of renewables. In fact, when asking for the respondents’ general opinion towards this source of energy, all the interviewees had a positive opinion regarding the benefits linked to
renewables’ adoption, specifying that renewables are effective for the environment, but, in order to adopt them, they would need to provide economic savings as well, confirming the insights mentioned above.

As for the other segment, the Users of renewables, the goal of the research was to dig into their renewable adoption process, in order to get a comprehensive understanding of respondents’ criteria for adoption, their evaluation phase and, above all, the main drivers for deciding to use these sources of energy.

Given that, it was discovered that the majority of the respondents owned thermoelectric panels, however just 1 person out of 9 was had solar panels provided by EDP, even if the company was the current electricity provider of all these individuals. More specifically, it was discovered that price and technical characteristics of the panels, such as size and durability, are considered as the most influential criteria during the adoption process by all respondents.

The same homogeneous results were not obtained regarding the consumer's evaluation phase of the decision making process, which differed a lot from person to person. However, a common pattern was that a direct contact with an expert or a sales specialist of the sector is always seen as crucial for the majority of the interviewees, since this part of the decision making process is perceived as the most difficult and complex one.

Finally, when asked about the main drivers for deciding to use a renewable source of energy, potential reduction on the average monthly bill was the most mentioned one, in line with the insights collected for the Non-users of renewables. Similar results were also obtained when asking to Renewables Users for their general opinion towards this source of energy. Even in this case, respondents had a very favourable opinion about renewables, considering them as an easy way to save money and helping the planet at the same time.

The third and last part of the research was based on two projectives techniques. The first one used was based on word association with brands the interviewees were able to recognize from
a list. The main findings linked to this part of the research revealed EDP was associated with words like “Energy” and “Electricity”, that confirm that consumers have a clear understanding of the frame of reference of the company. However, other words such as “Monopoly”, “Expensive” and “Chinese” give a specific picture of the current somewhat negative brand image perceived by the respondents. Other electricity companies mentioned by the respondents were Galp, Endesa and Iberdrola. Galp was mainly connected to words that demonstrate that for customers the image of Galp is mainly related to “Gas” and “Fuel”. On the other hand, Endesa and Iberdrola are mostly recognized as foreign companies with “Spain” being the main word that respondents connected to both companies (exhibit 9).

The other projective technique done aimed at attaining a understanding if the respondents had a clear image of a person that used renewables, defining if any type of prejudice was present, to identify other problems that may arise with the presentation of a new model.

Although not being very conclusive with some interviewees having a great deal of difficulty to answer, the main characteristics found to describe what can be considered as a green person were: a responsible person between 30 and 50 years old, that is fit and physically active, enjoys the outdoors and takes care of the environment by recycling and using public transportations, bicycles or electric cars. He or she would also be educated (Higher Education) and with a good upbringing and a good steady job that provides a generous income.

4.2. Qualitative Research: Industry experts

Given the technical aspect of this project and industry specific knowledge needed to fully understand the constraints that our potential business models could have, there was a need to conduct an interview with an expert in the renewable sources of energy sector. For this reason, a meeting with Eng. José Lobato Duarte, Head of Smarthome Marketing and Sales at EDP Comercial was arranged where concerns about the business models and the overall market were raised and clarified.
4.2.1. Main findings

When discussing the basic parameters the potential business models were developed upon with Eng. José Lobato Duarte, technical and legal issues arose that forced a rearrangement of the models accordingly. The foremost regarded the idea of sharing electricity and the parameters it could occur in the Portuguese electricity market, where it became clear that there would always need to be a certified mediator in order to make the transaction of electricity between two consumers legal. For this constraint, the previously presented models did not need to be readjusted since EDP was always to be the mediator in each one of the sharing electricity models developed. Nevertheless, a new model was conceived based on the sole sharing of excess energy produced by consumers that have photovoltaic installations in their homes. The **Excess Energy Sharing** business model became the simplest model since it would only require consumers to sign up for it, without any extra expense or investment.

Another issue that was made aware, was the actual process of transaction between the electrical grid and consumers with electricity production systems and legal constraints applied to it in recent years. Whereas in the beginning of the millennium there were several governmental incentives for consumers to adopt renewable sources of energy, including a price premium for energy sold to the grid by consumers with renewable electricity production systems in their homes. However, consumers started to take advantage of these premium as a source of income, not merely to be self sufficient in terms of their electricity. Therefore, the system changed where this premium gave place to a “penalty” with the electricity being sold to the grid at 90% of the pool price set by the regulator. This means that there is no longer an incentive for a consumer to have an installation that produces more than what they consume, since there is money to be lost in case they produce excess to sell. This presents itself as a constraint to our business models in the sense that all the electricity produced in one system would have to travel through the grid in order to reach the other parties involved in the
sharing solution, which means that the economic welfare of the immediate consumption of electricity in order to capture all its value would be harmed meaning the savings in the electricity bill would be lower for the person at the end of the sharing scheme.

The last major constraint encountered was related to the idea of generating electricity from solar panels in a large sized free standing installation (i.e. in a piece of unoccupied land) and using it to power individual households. There are two issues with this concept - the first is that the maximum capacity legally defined for these types of “solar farms” in Portugal has been reached meaning this is no longer an option for generation and production by companies. This type of installation is also a problem in the sense that the electricity generated is not immediately consumed, which leads to efficiency losses in both monetary and energetic terms, as explained before. Given this last constraint some adjustments were made to the models presented before, with EDP EnergyCommunity losing its “village option” since in this case the solar panels would have had to be installed in a centralized nearby landfill and not directly connected with each house in the village. Furthermore, and for the same reasons, the EDP SolarFarm.Com busineedd model was disregarded from hereon after.

4.3. Quantitative Research

4.3.1. Marketing Problem
Asses openness of consumers to various degrees of sharing electricity under different models, and what would be their desired specifications.

4.3.2. Methodology and Questionnaire
Due to time restrictions, the fastest way to deliver the questionnaire was online, mainly through email and social networks and there was a distinction in the questions between the population responsible for the home decisions and the one who is currently not. For the former there were differentiated sets of questions for people who already had renewable sources of energy at home and those who did not (exhibit 10).
The first section focused on validating the data previously collected during the qualitative interviews regarding renewables adoption and consideration. The following section focused on stating different scenarios with different models - that were in need of being tested to come up with a final product - and the degree of openness, attitude and conditions stated by the sample towards each hypothesis. This section was presented to the entire sample, excluding respondents that stated being owners of photovoltaic solar panels which were presented a different set of scenarios, more specific to their current situation. The end, all segments had to choose among all models the one which they would prefer to implement.

In order to confirm the results of the qualitative, questions regarding recall, recognition and attitude towards the energy brands were also conducted, as well as demographics and behaviour towards saving energy.

Despite the effort to achieve the most accurate results possible, there were some limitations and caveats throughout the whole process. In addition to the limited time one had to conduct the analysis, the sample size was relatively small, being constrained to the research group’s network and lack of technological access by a part of the population. Also, there was some limited access to data and information as some respondents did not have in-depth knowledge regarding the electricity market in general.

4.3.3. Sample

Sample for this Quantitative Research (detailed in exhibit 11), suffered from age bias due to age group concentration in the mediums used to proliferate the questionnaires. Therefore there was a plea for respondents to transmit the questions to their older relatives. In the end the sample was composed of 322 respondents that live in Portugal for at least three years and are older than 18 years old. Another filter was implemented to distinguish consumers that currently were in charge of the household decisions (57%) and the ones who would only be in the future (43%) - the purpose of creating two sets of questions for these different audiences.
was to better assess the progression potential of the business models according to the population. The overall characteristics of the audience are as follows: 59% women and 41% men; 50% is between 18 and 25 years old (due to the channels of propagation and the team’s network limitations) and there were representative groups of enquiries from all age groups until more than 65 years. Around 50% of this sample considered itself as financially independent and there was an attempt to better understand their living arrangements dividing this population in “Own house” (29%), “Own Apartment” (44%), Rented House (2%), Rented Apartment (19%) and Rented Room (6%).

4.3.4. Main findings

In what concerns the adoption of renewables, one can infer that most people take that decision when they are more stable, after creating a family (tendentiously when there are more people in the household), being less likely to adopt renewables if they decide alone (exhibit 12).

Generally, the main reason for not having considered the adoption of renewables was related with respondents’ living arrangements, specifically the fact of living in an apartment.

Respondents included in the Future segment (the ones that currently do not take decisions regarding electricity) are generally more open to consider adopting the solutions presented.

As a general overview on the consumer's preferences regarding the solutions presented, the Building solution was the most preferred in comparison with the others (67%) - independently of living arrangements - , followed by the Excess Energy Sharing option (12%). Curiously, almost 9% of the respondents would not engage in any of the solutions presented, a higher percentage than the one attributed to the solutions that involved a Roofsharing system, either alone or with a group (5% and 7%, respectively). Even though these latest solutions were the least preferred, when evaluating them individually, there was a high degree of consistency relatively to the percentage of energy respondents were willing to share (they were generally willing to receive as much as they would be willing to give).
The *Users of Photovoltaic Panels* (6 respondents, that account for around 2% of the total sample), generally have a correct perception of the panels’ price and corresponding payback period. It was verified an increasing tendency in the number of energy-efficient appliances with the increase of number of people in the household. As they were already using electricity generated by the photovoltaic panels, only the *Excess Energy Sharing* scenario was presented to them. Generally, this group was open to the solution, being willing to share if it caused no harm to their current situation. The most frequently mentioned conditions in order to engage in the solution were from economic (“bigger savings in electricity bill”) and environmental (“environmental responsibility issues”) origin. However, this last one had effectively less impact, especially on respondents with a lower household income per person.

Regarding the remaining *Users of RSE*, their main driver for adoption was the possibility of achieving bigger savings, independently of socio-demographic variables. Generally, the average electricity bill within this group was less than 150€.

The largest percentage of respondents belong to the *Non-Users of RSE* category. Within this group, most of the respondents have considered but ended up not adopting renewables mainly due to living arrangements constraints (not owning the place they live in or living in an apartment) or economic reasons (considering it too expensive). In fact, more than half of the respondents (51) ranked “too expensive” as one of the top 3 reasons for not adopting. From the ones that did not even consider the adoption of renewables, the majority (30) chose “living in an apartment” as the main reason of non consideration - most of whom prefered the building solution -, and a significant group simply “never thought about it”.

When analysing the evaluation of all the models presented individually, one can see that, in what concerns the *Roofsharing* solution adaptations (either investing alone, in a group or when assessing the willingness to rent own roof to another person/group), 61% of the respondents were willing to engage in this solution with specific conditions, being the
guarantee of “no power cuts” and “panels protection” the most mentioned, contrasting with “knowing the owner of the roof” and “having access to clean energy”. These results demonstrate that having access to a cleaner source of electricity is not perceived as a relevant driver in order to adopt a renewable source of energy.

When analysing the willingness to engage in Roofsharing alone, a significant percentage of people would not like to adopt this solution (17%) and the guarantee of “panel protection” and “no power cuts” are some reasons that might make people change their minds. However, 46% of these would not be willing to engage in the solution. In general, people are more willing to adopt this type of model when thinking of doing it with people they know as only 11% of respondents would not be willing to engage in a group Roofsharing solution at all.

Most of the respondents would be open to the idea of renting their roofs to other people, being most of them just accepting to do so under some conditions - the guarantee of “no maintenance” and “no extra cost” were the most popular ones.

The Building and Excess Energy Sharing solutions were generally well accepted by the respondents, registering a high willingness to adopt rate, 92% and 97%, respectively.

In case of not having sufficient money to invest, every age group would prefer not to opt for any of the presented financing options, with the exception of individuals older than 45 years old, that considered the “Renting” option as the most viable. This may indicate that informed people with a more stable financial situation are more open to alternative financing options.

Regarding group financing decisions, in general, responses are much more distributed among the available options as 28% of the respondents chose not to do it together with other people but 26% preferred the “Sharing Renting”.

In both cases (either investing alone or in a group), the Leasing option was the least preferred. When considering all the alternatives, respondents across all the Education levels generally did not exhibit any preferences when it came to financing options. Regarding the second
most preferred option, people with a higher education level (Bachelor Degree, Master Degree, Postgraduate and PhD) considered “Renting” as the most viable option. When using Occupation as a descriptive variable, “Renting” was the most preferred option within the Self-employed and Employed by third party respondents, while the remaining groups were not open to any of the financing options. When crossing the preferred solution with the financing options presented, one could see that most of the respondents that prefer the Building solution alternative would consider a “Shared Renting” financing option solution (28%).

To better understand how the brand EDP is seen by consumers, questions about the brand’s recall and recognition (exhibit 13) were asked. Firstly, when asked about which energy brand was the first they thought about, 95.3% of respondents answered with EDP as top-of-mind. The other two direct competitors both tied in second place with a recall of 1.6%. The only outlier was the “Energia dos Açores” as it is Azoreans main source of energy and electricity. When it comes to the brand’s recognition, once again EDP had the highest score with 98.8% of recognition by consumers. The second highest score was another portuguese company Galp with 96%. However, from the qualitative it was understood that people recognized the company more because of the petrol and gas side of the company than the home electricity. The second and third most recognised companies were the spanish brands Endesa (67%) and Iberdrola (48%). These results were directly affected by the campaign and promotion efforts developed by Endesa that started right before the quantitative research was performed. For the brand perception (exhibit 14), a semantic differential type of question was asked for EDP, Galp and Endesa (in case the respondent recognised the three or only showed the ones they recognised). With these polar opposites, EDP fared better (with a higher score) in matters of nationality, environmentally friendly, innovative and trustworthy. However, all of them were given the same middle score when it comes to transparency, and EDP was considered
the worst in high prices and being a monopoly (not serving the liberalized market).

4.4. Second Qualitative Research: Industry experts

In order to fully validate the insights and conclusion that were achieved through the quantitative research and to gain an even deeper knowledge regarding the technical aspects and the feasibility of the outcomes of the same research, a second interview with Eng. José Lobato Duarte was arranged. The focus of this second qualitative research was to dig inside the cost structure of EDP’s current solar panel offering, by understanding the correct breakdown of operations, especially regarding the price for the company of the solar panels themselves and installation costs for EDP, and to get insights regarding the feasibility of the intended project.

4.4.1. Main findings

In what concerns the financial aspects related to the purchase of solar panels from suppliers, it can be said that it is not possible to state a reference price, mainly due to the fact that EDP buys them on the terms of spot tariffs with foreign suppliers. However, it can be stated that an average price metric used by EDP is estimated as 0.50€ per Watt peak. Furthermore, solar panels are essentially bought on the criteria of the technical and quality aspect of them, especially because their output in terms of energy generation is deeply related with the level of savings that a future customer will be able to achieve. Regarding installation costs, it can be said that there are no significant differences in terms of expenditures for EDP, since a team of technicians is always needed for installing a solar panel-based solution, whether the solar panels be one or six (the maximum number of solar panels per house admitted by Portuguese law). Furthermore, another element is needed to be considered inside the installation breakdown, namely micro inverters for connecting the panels to houses. Finally, considering both the cost of acquisition of solar panels and installation costs, it was discovered that EDP applies a profit margin of roughly 20% on the entire solution.
As previously said, after having understood the cost structure of EDP, the next step was to gain insights about the workability of a new solar solution based on renting. In a first instance, doubts regarding a too extensive duration of the renting contract were expressed. As an example, American companies that are already in the market, like SolarCity and SunPower, are currently offering solar solutions based on rent with a minimum duration of 20 years. However, since net-metering (re-sell the excess energy to the grid without incurring in net losses) is not allowed in Europe and making the window for savings through renewables smaller when compared to America, this type of contract duration is not feasible in Portugal. Given that, a renting period of 5 years can be considered as feasible in Europe. Moreover, other limitations were founded, especially regarding the feasibility of the intended project for condominiums. This relates to the fact that the existing system for solar energy generating in households is very simplified and not smart, meaning that it can only connect one household to one set of solar panels directly. This hinders the intention of developing a business model that would rely on more than one consumer sharing energy originated in the same set of solar panels.

5. Solution: edp + solar

After taking into consideration the findings of the Primary and Secondary Research performed, as well as all the legal and technical limitations at play, the solution proposed is a service of renting photovoltaic panels to Portuguese households, whether they be houses or apartments. This solution will allow EDP to service a market segment with tremendous potential and that represent the majority of household types in Portugal - the apartments. The issue here is that consumers see the Decision Process too complicated and often assume that because of their living arrangements their use of renewable sources of energy is limited or even non-existent. Therefore, with a simple turn-key solution that transforms the entire process to be user friendly and easy to adhere to, consumers will jump to the opportunity of
saving money on the electricity bill while being good for the environment.  

_**edp + solar**_ allows consumers to sign up for a subscription plan (fixed tariff) that is unique to each building (depending on the number of subscribers in the building, as well as the building’s consumption, light exposure and available area for implementation) where consumers will always be saving on the overall yearly expenses. In this building solution, both the costs and benefits of the panels will be shared among neighbours.  

In the house solution, the same model will be applied with the only constraint of not sharing the panel with neighbours and being allowed to choose how many panels the consumer desires (and paying accordingly).  

All solutions will be attached to a 5 year contract, where EDP is responsible for the installation and maintenance, as well as removal of the panels at completion of the contract (if not renewed). There will also be an option of creating bundles of other EDP products with _Re:dy_ being the main one _Re:dy_.

### 6. Marketing Strategy

According to the modern perspective on Marketing, companies cannot address all customers in a broader way due to market heterogeneity. Therefore, they must divide it into segments with distinct needs and wants and identify the ones they can serve effectively and how to position themselves within the chosen segments. This strategic process, also known as STP (Segmentation, Targeting and Positioning), requires a deeper understanding on the consumer behaviour and marketplace environment. (Kotler & Keller, 2012).

#### 6.1. Segmentation

Segmentation is the first step on the Marketing Strategy and it consists on the “separation of a heterogeneous group of customers with different needs into homogenous subgroups or segments of customers with similar needs and preferences.” (Gupta, 2004).

According to the primary research, it can be inferred that the Portuguese households are very
homogeneous in what concerns the benefits sought and attitude towards renewable sources of energy. In fact, when thinking about adopting renewables, people perceive them primarily as a new source of savings instead of a way to be environmentally friendly. Furthermore, people do not perceive this as a primary investment in order to become energy efficient, so they opt first to adopt other electricity efficiency tools like LED lights and Plugs with switchers. Therefore, this investment generally takes part on a household when people start to constitute a family (considering family a household with more than one person living on it) and have financial stability to support the investment - a household is considered to have financial availability when the disposable income is above the national average - of 28737,4 in 2014. Moreover, another crucial constraint may arise when thinking about “going green” – the living arrangements, because living in an apartment is pointed out as one of the main reasons for not adopting renewables.

Concluding, concerning utilities, demographic variables seem to be the most relevant. Families are the main scope of the project due to their positive attitude towards renewables. However, other four sub-segments can be identified taking into account another two demographic variables: financial availability and living arrangements.

6.1.1. Personas

As stated before, it is possible to clearly distinguish four segments according to financial availability and living arrangements:

- The **Skyscrapers**, families who live in apartments that, despite having financial stability, search for new sources of savings and have enough resources to invest on renewable sources of energy, which are perceived as the next step for electricity efficiency and environmental sustainability. They have not done this yet due to space constraints, once the roof is shared with the neighbours;

- The **Residentials**, families who live in apartments and do not have financial stability.
They value new ways to save, but they cannot afford the investment on renewables. So, they prefer to search for cheaper tools like LED lights and plugs with a switch. They are not environmentally conscious at all and the financial constraint allied to the lack of space seems to be the greater reason for not adopting renewables;

- The **Mansionists**, families who live in single-houses that, despite having financial stability, search for new sources of savings and have enough resources to invest on renewable sources of energy, which are perceived as the next step for electricity efficiency and environmental sustainability. They have not done this yet mainly because they are not well-informed on the matter;

- The **Bungalowers**, families who live in single-houses and do not have financial stability. They value new ways to save, but they cannot afford the investment on renewables. So, they prefer to search for cheaper tools like LED lights and plugs with a switch. They are not environmentally conscious at all and the financial constraint seems to be the greater reason for not adopting renewables.

**6.2. Targeting**

“Targeting involves evaluating the attractiveness of each market segment, selecting one or more segments to pursue, and then designing marketing programs to serve them. The goal is to select segments that improve the organization’s chances of maximizing its long-term profitability in those segments.” (Gupta, 2014)

The attractiveness of each segment should be assessed according to its characteristics (like size, growth rate and profitability), its fit with the company considering resources, competencies and objectives of the latter, and its current and potential competitors. Once all the four segments score similar concerning company’s fit and competition, for the target selection the segments were rated from one to five taking into account Profitability Potential, Expected Market Penetration and Cross-Sell Opportunities (exhibit 15).
As a result, it can be inferred that the Skyscrapers represent the segment with higher potential, followed by the Mansionists. This happens mainly due to the fact that both segments have financial availability and, consequently, they score high on profitability potential and expected market penetration. Concluding, from the four main segments, two will be object of study from now on - the Skyscrapers and the Mansionists - due to their high attractiveness.

6.3. Positioning

“Positioning is the act of designing a company’s offering and image to occupy a distinctive place in the minds of the target market” (Kotler & Keller, 2012), being the last step on the Marketing Strategy development after Segmentation and Targeting. Therefore, two positioning statements must be developed because each target market presents different needs and searches for solving different problems.

6.3.1. Edp + solar: Building Solution’s positioning statement

To families that live in a building and seek new ways of saving on their electricity bill and do not have the space (Target Market), edp + solar is a brand of solar energy solutions (Frame of Reference) that offers a turnkey no hassle building solution at no cost (POD) powered by EDP, a well-established company for more than 40 years that assures the excellence of the service provided regarding energy flows and other additional services such as consumption/production tracking and maintenance (Reason to Believe).

6.3.2. Edp + solar: Villas Solution’s positioning statement

To families that live in a villa and seek new ways of saving on their electricity bill and do not have the resources to invest (Target Market), edp + solar is a brand of solar energy solutions (Frame of Reference) that offers a turnkey no hassle solution at no cost (POD) powered by EDP, a well-established company for more than 40 years that assures the excellence of the service provided regarding energy flows and other additional services such as consumption/production tracking and maintenance (Reason to Believe).
7. Brand

7.1. Brand identity

*edp + solar* is a brand of services that is inserted in the overall EDP brand. By maintaining EDP in the brand name there is a fast association with the company by the consumers that have an overall positive image of the enterprise, as previously stated during the research phase of the project. Moreover, the culture and identity of one brand should not be under constant transformation, so that consumers can identify and maintain the image previously associated with the brand. That being said, EDP’s new solution, *edp + solar* will maintain the overall aspects of the identity of the mother company, but focusing more on new trends and characteristics of the new service. To better assess this identity in a clear manner, Kapferer’s Brand Identity Prism Model was put into place.

7.1.1. Brand Identity *edp + solar*

**Physical** - Since the proposed solution is a service, physical aspect of the brand is less visible as if it were a product. Therefore, although the solar panels installed are visible, they look like all other brand’s. To differentiate and increase the recall in the consumers’ minds, the different brand elements must be indicative of the brand’s identity - the website and logo are visually attractive, modern and “clean”, while maintaining the red color and the symbology of the red circles/icons present for easier identification of the EDP brand being involved.

**Relationship** - *edp + solar* will be creating a relationship with its consumers based on trust from both sides with an open communication line where problems and suggestions can be revealed in order to better improve the overall service.

**Customer Reflection** - Since *edp + solar* is a new service that will be launched into the market with a high degree of innovation, the ideal consumer is someone that keeps up with the trends, is tech savvy, and is concerned about the environment and how to be more sustainable. He/she also needs to have a medium-high income in order to ensure the
continuous pay of the “rent” of the panels, while being an informed person that is interested in saving money and finds the best alternatives to do so without relinquish his/her lifestyle.

**Personality** - If *edp + solar* was seen as a person, it would be a young, outgoing, social and innovative person, that cares for others and for the environment. It is a loyal element that listens, cares, is protective and respectful of others. The reason why *edp + solar* should be perceived as a energetic and outgoing person is due to the innovation present on this new business model which needs to attract consumers. After catching the consumer’s attention it needs to “seduce” them and show the characteristics that make this opportunity unbeatable.

**Culture** - Since culture is one of the most defining characteristics of a company, it should not be subject to changes. Moreover, the current culture stated by EDP is in the same line as the new business model to be implemented. It can be stated that *edp + solar* fulfills the culture proposed to the fullest, with Innovation, Human centricity and Sustainability as its pillars.

**Self Image** - When subscribing to *edp + solar* consumers will start to see themselves in a different fashion, with more confidence in their actions and feelings towards global problems such as global warming. “I feel like I am doing something to help the environment.”; “I feel I am making smarter decisions with the spending of my money.”; or “Now I know my neighbours and we truly have created a community where we all benefit.” are some of the thoughts that may go through the customer's mind when using *edp + solar*.

After analysing EDP’s Brand Identity prism and comparing it to *edp + solar* there are clear but minor distinctions between them (Exhibit 16).

Since this new product is part of EDP, it cannot have a radical shift in the identity, in part to be consistent in the offerings but mainly not to create confusion and distress with consumers when confronted with two majorly different identities of one single brand. Therefore, to maintain the understanding and the positive connection and attitude the audience has with the
utilities’ company, although presented with a disruptive product, the company will maintain the same pillars present in all its branches, mainly reflected in the culture. However, the main differentiator factors all revolve around the consumer and the fact the company is trying to rejuvenate itself. When it comes to Customer Reflection, although EDP does not distinguish a specific audience considered the optimal client, edp + solar believes that to be significant and to achieve major influencers, the ideal customer is someone more informal and tech-savvy (among other characteristics previously described) which immediately demonstrates what the brand is trying to achieve in the Portuguese market. Moreover, its personality is connected to a younger, more active and communicative population that identifies with this new product. All in all, by combining these two separate elements, the Self-Image of the client will also inevitably change as different consumers will see themselves in a different light by being associated with such an innovative service as edp + solar is and represents.

7.2. Brand architecture

Edp + solar is a brand of rental services for renewable energy solutions that is part of EDP’s portfolio (exhibit 17). The other brand that deals with the same market of products, Energia Solar EDP, provides opportunity for consumers to purchase these solutions and offerings. In the future, it is expected for both brands to merge into one large offering of solar products, with options for purchase and renting. Moreover, since a large campaign will be implemented with communications efforts to publicize and increase the brand awareness the wiser future path is to maintain the new name of edp + solar and all the identity and elements that follow.

7.3. Brand elements

To maintain a clear image and identity in the consumers’ minds all brand elements created are coherent amongst themselves and also with the EDP main brand and norm book. The new elements created were the name, logo, slogan and micro-website. As for the
symbology, aspect and colors present in the logo, these are coherent with the rules of the mother brand, but at the same time have an emphasis on the clean and modern look, with accents of red and circular elements (exhibit 18). The name edp + solar and slogan “+ Para si, + Para Todos” are simple play on words that simultaneously are a call to action. On one hand the name implies that besides being solar solutions the company is also becoming more sustainable. On another hand, the slogan appears as a call to action and a play on words, appealing to the benefits of having the solution.

8. Service Mix

8.1. Product/Service

After the thorough research conducted, the product that was the most appealing to an array of consumers in representation if the portuguese population, was the rental service of renewable energy solutions. Moreover, since the majority of the physical issues for not having solar panels installed comes from the fact customers live in apartments, this was the main issue that needed to be solved. That being said, a general service was created with different specifications, pricing and process, depending on the living arrangements. These different conditions will be explained in the next subsections, as well as in the Product report.

Building Solution

To subscribe to this service, a 5 year contract will be signed by both parties where the consumer states not only that he will honor the contract until the end date but also will maintain a loyalty agreement with EDP electricity services for that period of time. The full extent of service will be provided by EDP, from installation to the maintenance to the solar panels themselves, all will be covered within the service. For a small fee each month, the consumer will have a solar panel installed and all the benefits of using this type of source of energy (mainly saving in the electricity bill by the end of each month). In order to have the best use of space (each panel is 2 square metres is area occupied), the most energy savings per
person, and to decrease the monthly costs to maintain savings (savings must be higher than monthly fee) it was stipulated that the minimum number of people that intend to install the solution in buildings will be two people, sharing a 1000W panel (creating a need for the company to upgrade their current offer from panels of 250W to 1000W, where the dimensions are the same and the price corresponds to four panels of 250, with no price increase). Although legally the maximum any consumer may install without paying an extra license is 1500W, with this solution each customer will be attributed only 500W as (s)he will divide a 1000W panel with another person.

Since this is a new business model it will also require a development in terms of technology associated, therefore there is a need to create a separate meter using components already present in the market. That being said, for a power of solar panels above 1500W, there is a legal need for a second meter to inject all energy produced into the grid to be sold. This new proposal takes that meter but instead of sending the energy back to the grid, distributes it through the different consumers’ houses, as it is used in most apartment buildings in the United States of America\(^\text{17}\) where the energy that comes from the grid goes to one single meter that then distributes it evenly among tenants. This meter will also control the amount of energy produced. The overall production will then be divided amongst subscribers so that the energy savings will be the same for all, even if one person uses the more than the rest during the hours of solar energy production. This meter will work on a basis of “On-Off” switch, meaning that it will be easier to manage the new subscribers and those who want to cancel the contract, without increasing the workload/construction.

Moreover, in order to incentivize a larger number of people to adhere everytime a new person joins, the bill for all the previous consumers will be lowered referencing to “Discount for new subscriber in the building”. However, what this will do is to balance the monthly payments.

\(^{17}\) http://www.universalutilities.com/
Villa Solution

As for the Villa Solution, it will combine the principles from both Building Solution and the Energia Solar EDP. This solution will allow consumers that live in individual houses (moradias) to have solar panels installed, through the service of rental with a contract of 5 years. The power and number of panels installed will depend directly some of the household factors such as consumption\textsuperscript{18}. However, since the decision process only depends on the individual (or family) living there, the consumer has the choice of installing more or less panels than recommended.

Like in the Building Solution, the available panels will still be the ones present in the inventory - 250W and 1000W panels - and the services covered by the company are also the same - installation, removal and maintenance.

8.2. Process

In the case of services, rather than products, processes are a determinant part of success, since a poorly designed process can damage frontline employees’ performance, which will impact service quality and customers’ satisfaction, leading to lower levels of customer loyalty and revenues (Frei & Morriss, 2012). Therefore, it is crucial to design an efficient process that strives to excel (Wirtz & Lovelock, 2016). In order to complete this task, two tools were developed to better describe the process design: a flowchart and a service blueprint.

8.2.1. Process Design

8.2.1.1. Edp + solar flowchart

To describe the sequential steps a customer undergoes when ‘flowing’ through the service process, two flowcharts were designed (exhibit 19), one per segment addressed. While the villa solution presents a similar service flow to Energia Solar EDP, the building solution is much more complex. Both processes initiate upon prospect’ initiative to run a simulation

\textsuperscript{18} Further explained in the Product report
(online or by phone) being contacted by phone afterwards to confirm the interest. However, the building solution process takes longer (up to three months) due to the need to contact the neighbours and make them reach an agreement. For the villas the decision-making unit is singular and, therefore, the process should not take longer than one month (exceptions might happen due to weather conditions in both cases). Looking in more detail, the process flows for both solutions present some differences. On one hand, after being initiated by the customer, villa solution process includes an on-site evaluation of conditions leading to a final contract proposal that upon acceptance by the customer only requires solar panel(s) installation. On the other hand in buildings, once the first customer runs the simulation and confirms their interest, all the other households within the same building are contacted by phone, if the majority are already EDP’s customers, or by door-to-door salespeople, in remaining cases, motivated by the fact that acquiring customers implies a bigger investment effort due to the level of customers’ commitment. After getting all households’ answers, an on-site evaluation of the building conditions is conducted leading to a final contract proposal that, this time, has to be accepted by all the prospects interested in joining collectively. Final contract proposal may suffer adjustments depending on the agreement level of the involved parties and after it is signed, the solar panels are installed. Furthermore, while villas can acquire the service whenever they want, people who live in apartments can only join the solution every six months after the first contract to make logistics and rent adjustment easier. In both solutions, in case of contract breach, either the customer gets another person within the same villa (case of moving houses) or within the same building (case of moving houses or getting another household interested) to assume his/her contract, otherwise the exit mechanisms\(^{19}\) are initiated. After breaching the contract or simply not renewing it, the solar panels can be reused in another customer’s roof. The remaining process will be simple - EDP presents the

\(^{19}\) As explained in the pricing section of this report presented further ahead
monthly bill and the customers pay the rent together with their electricity expenses.

8.2.1.2. *Edp + solar Service Blueprint and Service Attributes*

To reach a bigger level of detail regarding front back-office actions and service structure, a service blueprint must be designed, and once again, two blueprints were developed, one for each target market as it can be seen in detail on exhibit 20. By designing the service blueprint it becomes clearer the attributes in which *edp + solar* excels regarding its service offer. These attributes must be aligned with the ones the consumers require and, whenever possible, must cover gaps that competitors are underperforming in. In the case of *edp + solar*, the attributes required by the two addressed segments, villas and buildings, have different importances, despite being the same. In the attributes map present in exhibit 21, these differences are made clear, while also expressing the attributes in which *edp + solar* is overperforming in - the convenience/location attribute justifiable by the strategic goal of market penetration - or underperforming - as well as the ones where the brand is outperforming the competitors in the villas segment (as they are inexistent in the building segment) by offering a much lower level of initial investment required.

8.3. Price

After value for customers has been created through Product, it is now time to capture it through a feasible pricing strategy. Being *edp + solar* a new service with the promise of being a turn-key no hassle solution at no cost, a value-based pricing approach, where prices are set in relation to the benefits, namely the amount of savings provided to customers, is preferred over a classic cost-based approach, where the price level is set by adding a standard markup to the Cost of Goods sold (COGS).

To complete the task of developing a correct price-setting process based on the delivery of consistent value to customers, several steps are needed to be followed, namely the statement of a clear pricing objective deeply connected with the overall business strategy of *edp + solar*,
and the creation of specified pricing windows per served segment, by considering both the COGS for \textit{edp + solar} and the deliverable value of the offering.

\textbf{8.3.1. Pricing Objective}

The overall business strategy of \textit{edp + solar} is to achieve, in the long-run, a 20\% rate of penetration inside the market of Solar Energy Solutions (SESs) for households in Portugal. Consequently, a market penetration pricing strategy should be pursued. In fact, by adopting a price level that is perceived low enough, \textit{edp + solar} will be able to attract and hold a large base of customers. This can be stated mainly because, through the quantitative research mentioned in the sections above, enough of the market can be categorized as “price sensitive”, as the economic return is mentioned as the first driver of choice when deciding the adoption of a RSE. Given this, it is fundamental to let future customers to understand that by adopting the \textit{edp + solar} solution there will be the space for them to achieve consistent savings by using a clean source of energy. Furthermore, other gains that could derive by the adoption of this kind of strategy are constituted by the fact that a low level of prices will stimulate market growth and discourage actual and potential competition to enter this market, and by the fact that an increase in market share is deeply connected with the consequence of a higher inventory turnover, creating a positive effect on fixed overhead costs for \textit{edp + solar}.

Having this in mind, pricing windows for both the offered solutions, namely Villas and Buildings solution, are going to explored in the next section.

\textbf{8.3.2. Pricing window for “Villa Solution”}

To establish a pricing window for this type of solution, first the COGS for \textit{edp + solar} need to be established, as they represent the lowest allowable price point of the window. To correctly operate, the \textit{edp + solar} solution needs several components, and all of these represent an important weight inside the COGS accounting action. The primary component that is needed
to be considered is the cost of acquisition of photovoltaic solar panels\textsuperscript{20}, which EDP sources from multiple manufacturers at a cost of €0.50 per Watt-peak (exhibit 22). Secondly, costs regarding installation and maintenance of the panels count for the other main component of the COGS line. Using a break-down approach, it is possible to state that installation is composed by three subcomponents, namely the cost of a micro-inverter (exhibit 23), which are needed to convert the energy produced by the panels into usable energy for each household\textsuperscript{21}, the cost of the installation\textsuperscript{22} and the maintenance costs, which are estimated to be €0 since maintenance is done by rain. Finally, the last line of COGS is composed by the ownership costs, that can be defined as all the direct and indirect costs associated with the use of a product or a service (Kotler, P., 2010). In the case of the edp + solar’ solution, ownership costs are formed by the depreciation, replacement and partial installation costs and have been estimated as 30\% of the total hardware COGS. A further detailed break-down of COGS per installed power can be found in exhibit 24.

On the other hand, the ceiling of the pricing window for the villa solution is represented by the estimated total savings (exhibit 25) achievable when customers acquire solar panels. As an example, by assuming a “model customer”\textsuperscript{23} will adopt the solution with one solar panel, the total amount of potential savings along the lifetime of the 5-year contract is estimated as 480€, assuming an average yearly electricity consumption of €960,00\textsuperscript{24}.

Given that, the pricing window for a customer living in a villa will be between €480,00 and the COGS (also for 5 years) that edp + solar will incur in serving the customer, which are estimated as €238,20 plus VAT, resulting in the grand total of € 292,80.

To achieve marketing objectives of penetration of the solar energy solutions for household

\textsuperscript{20} From here on when solar panels are mentioned, consider they are photovoltaic.
\textsuperscript{21} The number of inverters is strictly connected to the amount of installed power (in Watt) of the solar panels. Until 250 W installed, just one inverter is needed. For 500W, two inverters are needed. From 750 W to 1500 W other types of upgraded inverters are needed, raising the COGS for the building segments.
\textsuperscript{22} Cost of installation is estimated with a constant value of €125,00 per unit.
\textsuperscript{23} Assume as “model customer” the one with an average electricity consumption of 80€ per month, who is not at home during the day but it is during the weekends and who has a Potência Contratada of 6,9kW/h.
\textsuperscript{24} According to CLab (2016) the average household electricity consumption per month in Portugal is estimated as €80,00.
use market, an optimal level of price that guarantees the delivery of important and consistent value to customers is estimated as €354,00\(^{25}\) (with VAT) over the 5 years of the contract. By establishing this level and still considering penetration as the main objective of the pricing strategy, \(edp + solar\) will still be able to achieve a margin of 17% on this type of solution. However, since villas’ consumption is usually higher than the nationwide average, there could be a need to an increase of the number of solar panels the household would require. That increase in additional solar panels’ number is followed by increases in the level of savings leading to a higher value for consumers, which means there was the need to establish higher incentives to encourage the installation of additional solar panels. This led to the decision of having a fixed price increase for every additional panel, estimated in €174,00 over the 5 years of the contract. Therefore, the monthly rent of the first solar panel was established to 5,90€ and the one per additional panel to 2,90€. All different pricing set-ups and margins connected with different type of configurations for more than one solar panels can be found in exhibit 26. Exit mechanisms have been created for customers that express the willingness to breach their contract. Again, customers can do it at any point of the contract’s lifetime however, when breaching it, they must pay the remaining value of the contract in Present Value (PV).

8.3.3. Pricing window for “Building Solution”

COGS for the Building solution were estimated similarly to Villas, with the difference that, to implement this different type of solution, an extra meter is needed to split electricity among all the apartments in the building that are part of the solution (exhibit 27). However, COGS with VAT are still the floor of the pricing window and the lowest possible price (exhibit 28). Having said that, there is now the need to define the average level of savings for the people that are going to be involved in the Building solution and that represents the highest price point allowable for this solution and the price ceiling of the window. Moreover, it is important

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\(^{25}\) Price setting has been made in order to let customers to save at least, in the most pessimistic view (just one solar panel and low average consumption), one electricity instalment per year.
to underline that, for each additional household added to the solution, the overall rent of solar panels for every household must decrease. To complete this task an objective function had to be developed. A parabola shape (exhibit 29) seemed to be the best fit for the solution considering the goal of incorporating an incentive scheme within the pricing strategy and for being adjustable to each specific situation (building).

In fact, the maximum final price must guarantee that the consumer saves at least 25% of what he/she would save if they were buying solar panels, meaning that this price level is translated into 75% of the potential savings and for the minimum number of households joining the solution, namely two. Formulas for maximum and minimum prices can be seen in exhibit 30. This price level leads to a negative margin for EDP over the 5 years of contract and it is obtained when the in-building penetration counts for 100%. However, besides being extremely difficult to obtain this level of in-building penetration due to external constraints, like for instance financial unavailability from households within the building or physical constraints like no roof space or other impactful structural issues, this negative margin is justified by the customer acquisition and loyalty gains. Given these constraints, the optimal in-building penetration for EDP is in fact the 50% that maximize the potential margins at the same time reducing the COGS. Having all the ingredients needed, the.

Moreover, the margins for edp + solar vary per the in-building penetration presenting a parabola shape by themselves (exhibit 31). This happens because COGS can be translated by a logarithmic function (exhibit 32). Therefore, it is possible to infer that margins are maximized when the in-building penetration reaches approximately 50% as it can be seen on exhibit 31, where the case of a model building with eight households was applied.

Furthermore, the same exit mechanisms have been created for households that express the

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26 A parabola can be defined by the following quadratic formula: \( p = m \times (z - h)^2 + v \), where \( p \) stands for the final monthly price for the consumer (with VAT included), \( z \) stands for the objective in-building penetration and \( h \) for the minimum in-building penetration. \( m \) and \( v \) are merely parameters that must be calculated.
desire to breach their contract before its actual conclusion upon reaching the 5 years. Customers can cancel their service subscription with \( edp + solar \) at any point of the contract’s lifetime however, when breaching it, they must pay the remaining value of the contract in Present Value (PV).

**8.4. Communication Plan**

In order to reach the intended goals upon the launch of \( edp + solar \), an effective plan to communicate this new service as well as introduce renewable sources of energy as something available to consumers everywhere. This communication’s plan must stress out the key benefits the service offers in a way that is relatable to the target audience via the advertising materials which aim to generate the intended action objectives and levels of awareness.

**8.4.1. Marketing Objectives**

The strategic goal of \( edp + solar \) is to penetrate the market of Solar Energy Solutions (SESs) for household use, hence, marketing objective for this campaign is to reach 3% market penetration\(^{27} \) within the first year after the service launch, which represents an increase of 27 percentage points of the current market penetration detainted by *Energia Solar EDP*. Despite competition being currently low in this market, competitive investment was set per the intended goals, explained further ahead in this report, which will require an estimate €2 million investment in this campaign.

**8.4.2. Target Audience Selection**

Understanding who are the potential and most promising prospects for \( edp + solar \) is crucial to develop an effective campaign. With this said, the primary target audience for this campaign are New Category Users (NCUs) meaning households that will enter the category of SESs for household use by becoming \( edp + solar \) customers. The individuals in this target market can be further characterized utilizing results from Primary and Secondary Research

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\(^{27}\) Due to constraints regarding available data, market share – the optimal indicator objective in this case – was unable to be determined, so market penetration was used as the closest indicator.
which showed that individuals that are at a more stable time of their lives i.e. families\textsuperscript{28} that want to take the next step in saving money on their electricity expenses\textsuperscript{29} are more prone to have or to at least have considered adopting SESs for their households (exhibit 12). Age was also considered to segment the audience as it is good indicator of a consumer’s stage in life with the interval considered being individuals between 30 to 55 years old. Lastly, the target audience must have the financial availability to undertake \textit{edp + solar} service as it requires a commitment to be paid at the end of each month. As for psychographic characterization, the target audience could be classified as ‘Achievers’ in light of the VALSTM\textsuperscript{30} framework as they are individuals that, despite putting their own well-being first, are still conscious of their community and peers and value technology and innovation that will allow them to achieve the best results (SBI, 2016). Furthermore, as this is a service communications campaign the secondary target audience will be the service’ employees, as a good campaign will make them strive for a better service provision (Wirtz & Lovelock, 2016).

\textbf{8.4.3. Target Audience Action Objectives and Behaviour}

The action objectives for this communications campaign is trial of both the brand \textit{edp + solar} as well as its Category, since it is a new brand targeting NCUs. Due to lack of reliable external data, trial goals were set on the estimations for sales by the end of the first-year considering the goal 3% market penetration which translates into a little over 177,000 contracts by the end of the first semester of 2019. However, a secondary trial action objective as simulation ran in any one of the channels available, further detailed in this report, due to the long-term commitment nature of the service. To understand the touch points to leverage at each stage of the target audience’ purchase decision journey as well as the roles each person can take in it, a Behavioural Sequence model was developed, available in exhibit 33.

\textsuperscript{28}Family is any committed relationship amongst people within the same household (couple with children, spouses, etc.)  
\textsuperscript{29}Previous steps are adoption of appliances that aim to reduce the electricity bill (LED light, smart meters/plugs, etc.)  
\textsuperscript{30}Used as a reference since VALS service is not available in Portugal, therefore this analysis is tentative
8.4.4. Communication Objectives

There are five different communication objectives to be considered for a campaign, the first being Category Need. Since SESs are not something regularly bought by the target audience, this objective is not latent in consumer’s minds which means that Category Need – and subsequent Awareness, Attitude and Purchase Intention – becomes focal communication objectives of this campaign and must be “sold” positively to the target audience.

Brand Awareness is one of the universal communication objectives of a campaign and can be described as the ability of the target audience to identify a certain brand within a category, prior to any communication effects, and it can be defined as either Recall or Recognition (Percy & Elliot, 2016) depending on the choice occasion in buyer behaviour or both. Since edp + solar is a new brand, promoting Brand Recall is a main communication objective for this campaign, once the goal is to have consumers remembering the brand when the category need is sparked and to attain this goal this plan will rely also on the transfer of the current high awareness of the brand EDP (exhibit 13).

The other universal communication objective is Brand Attitude. When dealing with NCUs within a new or recent product/service category, the new brand has no previous Attitude from buyers so the objective must be set to create a positive one (Rossiter & Percy, 1997). This is the case for this plan, which also aims to create a positive Category Attitude towards SESs for household use with the goal of increasing the consumer pool by positive associations.

Brand Purchase Intention can have one of two goals as an objective of a communications plan: assume or generate. For edp + solar a high-involvement purchase, an explicit intention is required for purchase to occur, so this campaign needs to generate Intention by including a call to action, driving the target audience to the desired action objectives (Rossiter & Bellman, 2005). Brand Purchase Facilitation must be incorporated as a communication objective in this campaign since edp + solar is a new brand and consumers do not know how they can act
upon their intention towards the service (exhibit 34).

8.4.5. Positioning Statement for Communications Plan

Despite leveraging on the position of the mother brand EDP to some extent, there is the need to place \textit{edp + solar} in consumers’ minds using the strongest purchase motivation which in this category is the need to save money on the electricity bill. Hence, the positioning statement reads as follows:

\textit{To families} with parents between 30-50 years old, looking for taking the next step in savings on the electricity bill (new category users), \textit{edp + solar} is a differentiated brand of solar energy solutions (where the product is the hero) \textit{that offers} a turnkey solution that allows people to save money on their electricity bill (problem avoidance) independently of their living arrangements (problem removal) while also offering consumers the possibility of engaging in their own community and contributing for a more sustainable environment (social approval) \textit{because} EDP is a well-established and reliable company with 40 years of expertise, that is driven by sustainable innovation and a high dedication in serving the consumers with the highest of standard. The \textit{advertising should} emphasize that the brand solves a problem by allowing consumers to save money while enjoying the comfort of their homes (from negative emotion to benefit to positive emotion: e®b®e in the attribute-benefit-emotion model) and also that it can serve consumers in all types of living arrangements, mention effortless subscription as entry ticket and omit price and technical aspects of the service.

8.4.6. Creative Strategy

Regarding to their electricity related habits, consumers value the security and certainty they are accustomed to that when they flip a light switch the power will turn on. This is true to extents past the mere necessity, meaning despite being highly motivated to save all the money they can on their utility bills, consumers prefer to turn on that extra light or the heater in favour of enjoying a more comfortable experience of their own home (CLab, 2016). With that
said, the Key Benefit Claim (KBC) for edp + solar should be that this brand offers a way to save money every month without losing any of the comfort consumers are accustomed to in their own homes. Moreover, the second most important benefit, which is that this solution fits all types of living arrangements, should be portrayed without overwriting the KBC. How it comes to life depends on the Creative Idea, the component of the Creative Strategy that is most determinant as supports all the advertising materials (Rossiter & Bellman, 2005). In order to resonate with consumers, the message of the campaign must have the right tone because only then it will have the desired impact. In this sense, for edp + solar’ campaign a simple storyline based on a real-life situation must be used to ensure maximum relatability of the entire target audience. Furthermore, the tempo must be upbeat and have an overall positive emotional appeal, since these elements present a strong foundation for creative development (Nielsen, 2015). Since edp + solar is a High-Involvement/ Informational brand, ads should introduce the initial attitude of the target audience towards the category, then showing the positive effects of the brand and how it solves the fact that they spend too much money on their electricity bill.

To attain the desired levels of Brand Recall, the association of the category need with edp + solar should be stated repeatedly and a fun mnemonic device will be used, in this case in form a jingle – whose lyrics can be seen in (exhibit 35) – which will use a melody that is known to consumers, to penetrate of their minds in a non-intrusive and non-overbearing way. To summarize this strategy, a Creative Brief was developed which is presented in exhibit 36.

8.4.7. Integrated Communications Strategy

Effective communications campaigns must bring together activities and means of advertising and promotion centrally integrated under the brand’s positioning, thus creating an Integrated Marketing Communications (IMC) plan. For this campaign, Public Relations (PR) will be used upon launch of the edp + solar by engaging with the press in an exclusive event to be
held in the two main shopping malls of the country. Moreover, singer Miguel Araújo will be contacted to record the jingle - based on one of his songs - which will allow leveraging on his fan base as potential proliferators of the song and its message. Another part of an IMC plan are promotions which can assist a manufacturer brand to promote trial (Rossiter & Percy, 1997). For this campaign, a ‘self-liquidating’ premium consumer promotion will be offered as an incentive for consumers, which will be a free 1-year Re:dy subscription, where interested consumers will still have to pay for the hardware necessary.

8.4.8. Media Strategy

Media Strategy must be aligned with the other objectives and strategies stated throughout the communications plan, especially considering the intended goals of Brand Awareness and Attitude. In this campaign’s case, the use of verbal content – both written and spoken – is vital to not only claim the key benefit, but also convey the brand name. Furthermore, high frequency is necessary to repeat the association between category need and brand for reaching the intended goal of Brand Recall whilst processing time should be prolonged so that the target audience can process the benefits claimed in ads, due to the High-Involvement/Informational nature of the service (Rossiter & Percy, 1997). With these tactics in mind, fitting primary media – which per Rossiter & Bellman (2005) are the mediums that can deliver all the communication objectives of the campaign – are Television and Internet.

Television is still a very trusted media across all generations which combined with its high unduplicated reach makes it crucial for edp + solar’s strategy, even more so being a service in a category related to a utilitarian expense that is common to every household in the market. The use of Television for this campaign will start with a 40 second ad (exhibit 37) being displayed in prime-time across the main channels, which will be eventually reduced to a 20 second ad running for the remaining of the campaign and both versions must respect the creative indications given above. As for the use of Internet in this campaign, it will be done
through the creation of a branded website (exhibit 38) which is the most trusted type of owned media by consumers (Nielsen, 2015) and a Facebook page dedicated to the *edp + solar* since this service relies heavily on positive experiences from users and engagement between them and prospects whilst allowing the brand to be in a more direct contact with the consumers and create the two-way relationship it strives for. Furthermore, ads on widespread daily use online platforms will be used since they may trigger a more immediate action once consumers see the ad and with a single click be taken to a place where they can have access to more information (Nielsen, 2015). Facebook and YouTube ads will be used because they allow for target audience specific impressions, whilst Google Ads allow for keyword buying prompting brand exposure anytime a consumer shows interest in the category. As secondary media Newspapers and Magazines will be used since they allow for a more extensive benefit claim and higher processing time. Also, Radio and Out-of-Home (OOH) materials will be used both for their reach and frequency as well as forceful exposure potential during waiting periods, i.e. traffic. In addition, this campaign will have a teaser campaign since it is an effective way for a brand to launch a new product (Rossiter & Bellman, 2005) where only the first 5 seconds of the jingle and partial logo of *edp + solar* will be used in TV, OOH materials and Social Media. This will leverage on Priming where the incomplete first message of the teaser will motivate the audience to process the second message of the full ads, via curiosity. Lastly, a Brand Activation initiative will happen in Colombo and NorteShopping, as a tangible way for consumers to experience the brand and its services in a fun and interactive way while generating buzz and excitement around the launch.

### 8.4.9. Budget Break down and Campaign Schedule

Budget was set per theoretical considerations as well as intended goals of target audience reach due to constraints on measuring current expenditures in communications for the market. To set the tone in the category and given that market share growth is driven by high levels of
share of voice (Binet & Field, 2008), communication should be a main operating expense, amounting up to €2 million. More than half of this budget was allocated to the primary media (50.7%) while the remaining was split into secondary media and creative content development costs, of which OOH materials occupied the second biggest share (exhibit 39).

Since it regards solar energy, the service and its campaign launch should start in the Spring, to take advantage of subconscious associations on consumers’ minds. The campaign will start in mid-April 2018 – due to the message relying on the approach of the “end of the month” –, with the launch of the teaser that will precede the product launch scheduled for the last days of the same month. Afterwards, the main campaign will commence with the integral ads running on Television and Radio for the first weeks and the Brand Activation initiative launched in the first days of the service in the market. In addition, a Christmas campaign was considered due to Primary Research results stating consumers spend more on electricity in the Winter, making them more conscious about saving money there. A tentative schedule was also made for 2019, but it is not included in the strategies discussed in this report (Exhibit 40).

8.4.10. Campaign Tracking

To ensure that all the communication efforts are working towards the intended goals, campaign tracking mechanisms must be set up and Key Performance Indicators (KPIs) must be established. For this campaign, there are two different sets of KPIs: general and digital oriented. One of the main KPIs in the general set is the campaign Return on Investment, which will be expressed as ultimate sales generated due to effects of the campaign. Furthermore, levels of Brand Awareness (with an emphasis on Recall) for edp + solar as well as other communication effects track records must be kept to ensure the right message is being perceived by consumers.

Digital KPIs include click-through-rate in paid advertising as well as conversion rate in terms of number of consumers that enter the branded website and do a simulation. Moreover, micro
website traffic and reach of social media posts must be monitored to ensure engagement.

8.5. Place

8.5.1. EDP Distribution Channels

An analysis of EDP’s current distribution channel strategy is important to assess to which extent an adaptation could be made to suit *edp + solar*’s strategy and objectives. Regarding *Energia Solar EDP* most specifically, as it is the most similar service to *edp + solar*, EDP reaches its end-users through the following channels: physical points of purchase (EDP stores and agents – divided into *Agentes de Atendimento*, that sell EDP’s products and services; and *Agentes de Cobrança*, that only process bill payments); the company’s website\(^{31}\) (through which the consumer can run the simulation in order to assess the conditions to adopt the service); call-centre team (outsourced from specialized entities); and direct sales (door-to-door sales force). A detailed scheme and process explanation can be found in exhibit 41.

8.5.2. *Edp + solar* Distribution Channels Strategy

8.5.2.1. End-User Analysis: Segmentation, Positioning and Targeting

The segmentation analysis was conducted based on service output\(^{32}\) demanded by end-consumers, since they value the final offer as the combination of the service itself and the service output bundle provided. Before defining the segments, the existent service outputs (whose detailed definition can be found in exhibit 42) and their specificities should be analysed in light of *edp + solar* solution. Looking at the service outputs demanded, whose detailed description relatively to this service can be found in exhibit 43, some differences can be detected concerning preferences on **spatial convenience** – as some customers prefer the process to be *remote*\(^{33}\) and others *in-store* - and on **customer service** level – measured as *high* and *low*. Considering these two dimensions, four different segments can then be defined:

\(^{31}\) [https://energia.edp.pt/particulares/]

\(^{32}\) Service Outputs: value added services created by channel members and consumed by end-users, together with the product/service purchased (Palmatier, et al., 2015).

\(^{33}\) Refers to the preference for not needing to go to a physical POP to buy the product/service.
Segment A - *In-Store*, High Customer Service; Segment B – *Remote*, High Customer Service; Segment C – *In-Store*, Low Customer Service; and Segment D – *Remote*, Low Customer Service. Additionally, one should have in mind that all of these segments require the lowest **waiting time** possible and the highest level of **information provision**. Relatively to **product variety and assortment**, a customized offer is designed to each consumer, taking into account the different assortment needs (exhibit 44).

In this case, there is the possibility to reach the defined segments through a customized channel strategy, following the goal of *edp + solar* to be integrated in the Portuguese market.

### 8.5.2.2. Channel Design

#### 8.5.2.2.1. Channel Members

The upstream position is occupied by the **suppliers** that are the different producers of solar panels, inverters and meters (the service tangible items). Suppliers sell those items to **EDP**, the manufacturer of the service *edp + solar* and the “**channel captain**”, acting as the prime mover in establishing and maintaining channel links. EDP also owns the **warehouse** where the service tangible items are stored before being installed in the customer’s roof. A set of channels, coordinated and oriented by EDP, are designed to reach end-consumers, being them: the **online channel** - *edp + solar* exclusive micro website (a webpage sample and detailed section description can be found in exhibit 38; the current 65 **official physical stores** in Portugal, where customers can get information about the service and conduct the simulation – with the help and guidance of a collaborator or autonomously through the do-it-yourself monitors (exhibit 45) – as well as forward steps of the process; the **Door-to-Door channel** that is composed by the direct sales team in charge of selling *edp + solar solution*; the **Call-Centre** that acts as a telemarketing and information support channel and has an exclusive phone number dedicated to EDP solar solutions (808 914 372); and the **Agentes de Atendimento** that are currently 177 in Portugal and that would incorporate *edp + solar* in the
service portfolio they already sell to end-consumers. The last two channel members are the only detached from the other channels as they are only oriented and supervised by EDP, not being totally controlled.

8.5.2.2.2. Types of Channel per Segment

Based on the positioning map of exhibit 44, specific channels addressing each segment were identified and are summarized in Figure 1 summarizes per segments’ preferences.

<table>
<thead>
<tr>
<th>Segment</th>
<th>Preferences</th>
<th>Most adequate channel(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Customer Service</td>
<td>Spatial Convenience</td>
</tr>
<tr>
<td>A</td>
<td>High</td>
<td>In-Store</td>
</tr>
<tr>
<td>B</td>
<td>High</td>
<td>Remote</td>
</tr>
<tr>
<td>C</td>
<td>Low</td>
<td>In-Store</td>
</tr>
<tr>
<td>D</td>
<td>Low</td>
<td>Remote</td>
</tr>
</tbody>
</table>

Figure 1: Distribution Segments: Preferences and Channels

8.5.2.2.3. Channel Structure

To better understand the distribution structure, the reading of this section should be done together with the analysis of the exhibit 41. Similarly to the current channel structure of EDP (exhibit 46), the frequent contact between suppliers and the company would be maintained for this new service, as EDP orders and pays the service tangible items (1) and the suppliers deliver the ordered items (2), that would then be stored at the edp + solar warehouse – a new rented facility for the effect -, until they are installed in the end-user’s property. Once a consumer engages in edp + solar solution, the service (including the service tangible items to be installed) is delivered directly from EDP to end-consumers (3)34. From the installation moment onwards, the end-consumer has to pay a monthly rent to the service provider. The contact between the channels - agents, online (edp + solar Website), physical stores, call-centre and door-to-door sales force - and the end-consumers happens during the whole

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34 Detailed information in the communications plan section of this report.
process (see flow marked as (*) in exhibit 41). Special attention should be given a reverse logistics phenomenon that might occur in case of breach or non-renewal of the contract. At this point, the tangible items once installed in the customer’s roof need to be returned and stored again at the warehouse (4). If the retrieved panels are still within the 25-year lifetime period, they can be installed in another customer’s roof that adopts the solution.

8.5.2.2.4. Channel Flows

This section summarizes the flows that occur between the three main stakeholders in this process (the tangible items’ producers, EDP and the end-consumers), present in exhibit 47.

Physical Possession: Suppliers (where the items are produced) → EDP (received and stored at the warehouse) → End-consumers (once installed in the customer’s property).

Ownership: Suppliers (initial ownership holders, before sale and payment are made) → EDP (final ownership holders, once the payment is made). As it is a rental service, the end-user does not own the service tangible items.

Promotion: EDP (through the channels - online, on physical stores (EDP own stores and agents), telemarketing and door-to-door sales force, advertising campaign) → End-consumers

Negotiation and Financing: Suppliers ↔ EDP. The existence of negotiation agreements between EDP and suppliers, benefits EDP as it enjoys a degree of bargaining power that, combined with large orders, result in quantity discounts\(^ {35} \). Negotiation is not possible between service provider and end-consumer given that it is a customized solution\(^ {36} \).

Risk: Suppliers (bear the risk until payment is made and items are delivered) ↔ EDP (in charge of replacing the tangible items due to uncontrollable circumstances or end-of product lifetime). In the case of solar panels, a 10-year warranty is guaranteed by the supplier (justification of the two-way flow). If any of the service tangible items are intentionally damaged, the consumer should be held responsible. No insurance fee is included.

\(^{35}\) A 20% supplier discount was assumed for solar panels and inverters and a 10% discount was applied for meters.

\(^{36}\) As per the information previously detailed in the pricing section of the report.
Ordering and Payment: Suppliers ← (frequent ordering is made and payment is done within a timeframe of 60 days\(^3\))  
EDP← (order occurs every time a contract is signed, usually in a period up to three months since the simulation is conducted; monthly predefined rent payment is done throughout the contract period)  
End-consumers

Information Sharing: Suppliers (direct contact) ↔ EDP (through the defined channels) ↔ End-consumers

8.5.2.3. Gap Analysis

An initial analysis of internal and external factors that might affect the channel implementation must be conducted. As all the channels to be used by edp + solar already exist at some extent within EDP’s distribution, it becomes important to analyse the differences between the optimal and actual channels.

8.5.2.3.1. Managerial and Environmental Bounds

At a managerial level, an information provision gap might occur if collaborators lack knowledge about the service and its process. Also, the high complexity of the process might increase the frequency of consumers going to physical stores, that is, per se, a costlier channel. Additionally, it might occur an incentive system clash as a channel might make more profit (in a short-run perspective) by selling Energia Solar EDP service than edp + solar.

Regarding environmental bounds, the fact that in the Azores and Madeira islands there are specific electricity suppliers and tariffs, all the distribution and competitive landscape is different, making the establishment of this edp + solar in those regions harder. Also, the fact that not everyone is tech-savvy might increase costs as the online channel is the cheapest one.

8.5.2.3.2. Competitive Benchmarks

Looking at edp + solar competitive benchmarks, it is only possible to register similar solutions for the villa segment, since no other solutions for buildings are currently present in the market. These solutions consist on the possibility of buying solar panels, either through

\(^3\) (EDP - Energias de Portugal, S.A. 2009)
*Energia Solar EDP* service or smaller retailers. In the first case the process is similar (with the possibility of paying in instalments) whereas in the second one it is simpler, as the payment is made up front with no alternative financing options.

### 8.5.2.3.3. Demand and Supply Side Gaps

Demand side gaps mean that at least one of the service outputs demanded is not being appropriately met by the channel, being either under or oversupplied.

A **waiting time** gap in *edp + solar* service provision was detected for the building solution given the long process end-users are subject to - from the moment they conduct the simulation until the service installation is effectively made (gap felt by the *Skyscrapers* segment). Additionally, the in-store waiting time is also a concern as end-users desire to be served faster, which is not always possible given the store affluence and limited in-store collaborators (Service Output Demanded (SOD) > Service Output Supplied (SOS)). A **customer service** gap was also detected in segment C’s needs, currently oversupplied in what concerns in-store experience, whose regular service is characterized by direct monitoring and help by the in-store collaborators (SOS > SOD) (summarized in exhibit 48).

As for supply side gaps, when analysing *edp + solar* channel flows, none were identified, meaning that no flow in the distribution channel is carried out at too high a cost.

### 8.5.2.3.4. Closing Gaps

To close the demand gaps – either in terms of customer service and waiting time –, a *do-it-yourself* system (exhibit 45) is implemented in the physical stores so that customers can get information about the service and conduct the simulation in a faster and autonomous way. Regarding the building solution process duration, it cannot be completely overcome as it depends mainly on the group of households’ decision making process. On the other hand, in order to overcome the possible managerial bounds affecting the information provision service output that might arise, an insightful training program should be given to all the collaborators.
involved in the process. Moreover, incentive system clash can be overcome by designing a specific incentive scheme for channel collaborators, detailed in the following section.

8.6. People

All people that play a part in the service exchange must be analyzed, from customers to employees, and their roles specified. Since, Edp + solar’s process only starts when the customer takes the initiative to run a simulation online or by phone, making them extremely important players in the entire process. The reliance on customers to do a substantial extent of the work is extremely beneficial because it cuts costs by sparing employees’ time.

Furthermore, there is a moderate participation level from the customer due to the solution’s degree of customization and to the need of co-creation in the early stages of the process. This is enhanced in the building solution due to the role that customers perform as influencers over their neighbours. In this way, edp + solar gets customers to do the work and cuts costs with the online do-it-yourself simulation and by transforming customers into sales people giving them proper incentives such as extra savings. Moreover, for all their work, customers must be further compensated and the brand must set them up not to fail. This clearly happens for both solutions since customers are not disturbed with calls and given the opportunity to perform everything online. Furthermore, the online simulation questions (exhibit 49) are designed in order to make it easy and effortless for customers to answer. Moreover, in the building solution customers are clearly instructed by email (after the first contact) with a detailed simulation that shows how much the price per month decreases per additional person in the solution, and with a detailed brochure that can be shared with the neighbours explaining all the process. Additionally, EDP analyses the potential of each building as a consumer unit and triggers, in parallel, a customer acquisition process using door-to-door salesforce or telemarketing as mentioned before.

The other players in the service exchange are the brand’s employees, that must be able and
motivated to achieve excellence (Frei & Morriss, 2012). Thus, it is important to understand who these employees are, which activities they perform and which incentives they have. Several different groups of service personnel can be identified, they are: outsourced call-centre employees, in-store and door-to-door salespeople, agents, technicians/engineers and edp + solar management team composed of one team director and five product managers - four for the building solution (one per region: Grande Lisboa, Grande Porto, Norte/Centro and Sul/Ilhas) and one for the villa solution (integrated the Energia Solar EDP’s team).

The first ones are responsible for the telemarketing campaigns and for customer service, while in-store salespeople and agents perform similar activities like customer service and sales/payment support and door-to-door salespeople are only in charge of selling the solutions. Engineers/technicians are responsible for the technical support, installation, maintenance assistance and technology development. Finally, the activities allocated to the edp + solar Team Director consist on supervision, decision making and product, process and marketing management while the product managers monitor the respective salesforce teams.

8.6.1. Training

To guarantee that employees are set up to succeed, training activities must be employed in order to ensure that all the personnel has the necessary tools to excel on customer service. Moreover, by leading to higher performance levels, training activities also contribute to the improvement of employees' motivation. In this sense, training programs are to be implemented at least once per year in order to align goals or when new people join the sales force teams. It is important to mention that this effort should be bigger in the beginning with the solutions’ introduction in the market. Besides the instruction provided, some scripts related to customer service and support must be available for employees to consult (see exhibit 50). This guidance is extremely helpful on the job performance, mainly concerning the agents and the call centre that because it is outsourced is more difficulty controlled.
8.6.2. Incentive System

Incentive systems are crucial for keeping employees motivated while performing their job functions and they may be monetary and/or non-monetary. Due to the high investment needs associated with this project, the first ones will only apply to agents that currently earn a 10% commission on sales\(^{38}\). For the management and technical teams the incentives given are job promotions and for the sales teams more “practical” incentives are also attributed to reward the extra effort they have in persuading the customers to buy the *edp + solar* solution. These incentives are free EDP’s products/services (e.g. Re:dy or Funciona) for a year when a door-to-door salesperson has sold 180 *edp + solar* solutions or the granting of extra five vacation days for the best in-store salesperson, always concerning the previous year. In this incentive scheme, only the call-centre was left out since it is an outsourced entity with its own incentive system. Moreover, incentives for selling *Energia Solar EDP*’ offerings should be reviewed to prevent clashes and hurdles when selling *edp + solar*.

8.7. Physical Evidence

8.7.1. Tangible Perspective

For *edp + solar*, there are three tangible items for the service core offering: **solar panels** (with installed power of either 250W or 1000W - exhibit 51); **inverters** (micro and isolated/hybrid inverters - exhibit 52); and **meters** (production/consumption meter - exhibit 53).

8.7.2. Environment Perspective

In what concerns *edp + solar* service environment components, the *edp + solar* **website** is one of the most relevant channels for the service experience (exhibit 38). Additionally, one can emphasize the **physical store** environment as a critical component of the service experience. *edp + solar*’s strategy should focus on providing a pleasant in-store experience (for customers to be satisfied), that indirectly stimulates the consumer’s senses, creating a connection with

\(^{38}\) Information provided by EDP Comercial
the service experience. Taking into account the verified positive impact of *in-store* touch displays in sales, an experience at the point of purchase was created, in the form of the installation of a do-it-yourself monitor (exhibit 45), through which the customer can get more information about *edp + solar* and autonomously conduct the simulation in a fast and efficient way. At the same time, specialized in-store collaborators are available to guide the customers and help with the whole process, involving person-to-person contact at some level. An additional experience would be conducted at shopping centres (Colombo and NorteShopping), consisting on the placement of an “*energy efficient house*” model where visitors can enter and experience the life in a fully equipped house served by EDP service portfolio, while discovering more about the process and the new offering itself (also having the possibility of conducting the simulation at that time) (exhibit 54). The goal is for customers to feel relaxed and stimulated, while absorbing the message that they can achieve a higher level of efficiency in their homes without giving up on the comfort they already have.

9. **Key Success Factors**

After describing how the launch of *edp + solar* in the market is expected to be implemented, it is important to assess the financial viability of the project and how its performance might be measured. Hence Key Success Factors\(^{39}\) (KSF) should be recognised and within the solar solutions market it was possible to identify several major KSF. Firstly, Category Acceptance is a major factor because the success of this service mix relies on consumers becoming open to the use of solar energy solutions for their homes and understanding their benefits fully. Secondly, the Brand’ success is also of key importance for the company, since it is its entry ticket to this market (considering that the current offerings of EDP are not under a unique and fully communicated brand). Finally, Service Experience is also a key success factor since the nature of the service is highly dependable on the positive word-of-mouth by consumers to

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\(^{39}\) Key Success Factors are critical factors that may endanger the business, so the company should keep an eye out for them
prospects, whether they are just friends and family or neighbours within the same building trying to recruit more neighbours to lower overall rents.

10. Profit and Loss

Having set all the elements of edp + solar’ Marketing Mix, a forecast of the results for the upcoming 10 years (until 2027, being 2017 the year zero - the development phase) must be developed. A project management perspective was assumed (only considering the incremental values) and a scenario analysis was also conducted for a Pessimistic, an Optimistic and an Expected scenario. The following section explains the main assumptions for the latter only.

10.1. Main Assumptions

For the computation of edp + solar’ P&L (exhibit 55) several assumptions were made. These ones are mainly based on data provided by different teams of EDP and depend on the solution’s requirements being different for the building and for the villa solution.

10.1.1. Edp + solar – Building Solution Revenues

When computing the revenues for the building solution, a “model building” and a “model household” were assumed. For the latter, the average electricity consumption considered was of 80€, being attributed with two solar panels of 250W each, which leads to savings of 15% on the electricity bill. On other hand, the “model building” is composed by eight “model households”. Therefore, the aggregated average consumption is 80€ and everybody within the building gets two solar panels (500 W of power in total), leading to a monthly rent of 7.32€.

Furthermore, it was assumed that when joining the solution consumers only join two by two, being the maximum in-building penetration of 25%. Additionally, for the first year (2018), a 1% market penetration was considered (26.744 households from a total of 2.674.49643) and a

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40 National average household consumption according to “CASA” report (CLAB, 2016) with VAT included.
41 Savings level was calculated based on the Savings equation present on the Pricing section considering a “model household” that is at home during the weekends but not during the day and has a Potência Contratada of 6,9.
42 VAT not included. For further detail, check Pricing section of this report.
43 Calculated based on the total number of households of 5.926.286 (PORDATA, Alojamentos familiares clássicos em Portugal, 2016) and overall buildings including single houses of 3.586.102 (PORDATA, Edifícios de habitação familiar clássica em Portugal, 2016).
maximum possible penetration of 20\%^{44} reached in a timespan of ten years. This market penetration evolution entails for an annual growth of 4 p.p.\(^{45}\) in 2019 and 2020, an annual growth of 2 p.p. between 2021 and 2023 and of 1 p.p. from 2024 onwards. Moreover, some assumptions related to contract breach had to be made due to its impact on revenues as customers who breach contract must pay a sanction or transfer the contract to another one as already mentioned on the Process section. With this said, a 5\% breach was considered where 40\% of them choose to pay a sanction (2\% of total contracts). This breach was assumed to happen in the middle of the contract (year 2,5), happening for the first time in the project’s timespan at the end of 2020.

10.1.2. \textit{Edp + solar – Villa Solution Revenues}

For the revenues computation for the villa solution, the assumptions are like the aforementioned with some exceptions. The “model villa” was assumed to have the same characteristics of a “model household”, thus leading to a monthly rent of 7,15€\(^{46}\). The same initial penetration of 1\% was assumed (32.516 households from a total of 3.251.790) as well as the same maximum market penetration entailed for the same growth behaviour. Moreover, the same contract breach assumptions were considered.

10.1.3. Cost of Goods Sold (COGS)

To calculate COGS, data was provided by EDP. Concerning the building solution, three elements compose the COGS: the solar panels, the inverters and meters (which costs can be found in further detail in exhibits 22-24 and 27-28). Therefore, for a “model building” where only two households join the solution, the power to be installed (1000W) represents a total

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\(^{44}\) This value is obtained by the following reasoning: 20\% of the buildings in Portugal are not able to receive the solution due to physical constraints. Therefore, the maximum building penetration is 80\%, where only half of them are consider to have the financial availability necessary to join the solution, dropping this value to 40\%. The maximum in-building penetration is assumed to be 50\% since it is very hard to get all the apartments joining the solution leading to the estimated value of 20\% of penetration in household terms.

\(^{45}\) Percentage points.

\(^{46}\) VAT not included. For further detail, check Pricing section of this report.
COGS of 1.097,56€, leading to monthly COGS of 9,85€ per “model household”. For the villa solution, the meter is not necessary and, by applying the same reasoning as for the building solution, the monthly COGS per “model household” are 9,10€. It is important to understand that within the previous values computed for total COGS, 30% were assumed to represent ownership costs (containing depreciation, replacement and installation costs and a portion of the hardware costs). As before mentioned, the total COGS are imputed in the P&L on the first five years of the hardware’s lifecycle corresponding to the duration of the first contract associated to the first time the hardware bundle gets installed. Therefore, after the first contract, the hardware is monetised for the rest of its lifetime (20 years) at zero COGS. This conservative approach happens so that EDP is not dependent on a second contract to get the investment back. Moreover, besides having gains on COGS after these five years, there are also gains when breaching contract because the solar panels allocated to those households can be reused in others. Due to contract breach the COGS increase on the year of breach since they are totally imputed on that year. COGS also increase considering that 5% of the edp + solar’ sales are conducted by Agents who receive a 10% commission over sales (exhibit 56 for details on sales channel allocation).

10.1.4. Operating Costs

The operating costs comprise the expenditures with warehousing, personnel and training. As for the first a monthly rent of 1620€ was assumed (exhibit 57), the extra hired personnel - one team manager and four regional managers – counted for monthly salaries of 2.500€ and 1.500€ each respectively, values to which the social security tax of 23,75% (KPMG, 2016)

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47 Value comprises 400€ in solar panels (0,40€ per Watt/peak including a 20% supplier discount); 254€ in an inverter with 1000W capacity (including a 20% supplier discount); 243,90€ in an additional meter (that commonly costs 400€ including VAT, a margin of approximately 20% - EDP standard - and a 10% supplier discount was applied); 200€ of installation costs and 0€ of maintenance.
48 Value obtained by spreading the total COGS over the contract’s five years, considering time-value-for-money. So the monthly value of 19,70€ is reached, which will be divided by the number of households within the solution, in this case two.
49 Assume this value is based on the installed power of 500W needed for one “model household” (200€ in solar panels and a total of 182€ in two inverters with 250W capacity each) and that, in this case, the installation costs are only of 125€ due to the lower installation complexity since an additional meter is not necessary. This leads to a total COGS of 507,11€.
50 Hardware’s lifecycle is expected to be of 25 years.
51 According to Dr. José Queirós de Almeida from EDP Comercial – DCMK.
had to be added. Considering training expenses, it was considered that only one third of EDP’s employees in Portugal - 2,228 from 6,683 (EDP, Relatório e Contas, 2016) – were involved in this solution and that they receive 20 hours of training in a yearly base at a cost of 5€ per hour. It is important to mention that these expenses diminish 10% per year since the training requirements will be progressively lower as the service matures. For a summary on this cost line consult the exhibit 58.

10.1.5. Cannibalization Effects

In this subsection, it is important to understand that cannibalization effects can be either positive or negative, being considered only the ones that are related to solar solutions and electricity itself. On the negative side, 5% of the revenues were assumed to result from cannibalization on the current EDP’s solar solution, while on the positive side, it was presumed that, with all the awareness created around the product category (consult Communications Plan section for further detail), 15% of the consumers\(^\text{52}\) that would buy \textit{edp + solar} would prefer to acquire the \textit{Energia Solar EDP}’s solution\(^\text{53}\). For the computation of the cannibalization effects of this offering only a 20% margin over the service was considered.\(^\text{54}\) Moreover, it was assumed that 30% of the households joining \textit{edp + solar} would acquire \textit{Re:dy}\(^\text{55}\) and that there are also monthly gains on the electricity bill related to \textit{Défice Tarifário}\(^\text{56}\) of 6%\(^\text{57}\). For further detail on cannibalization effects, see the exhibit 59.

10.1.6. Marketing Costs and CAPEX/Working Capital Requirements

To reach the proposed communication objectives (i.e. 3% market penetration), the

\(^{52}\) For the calculations, it was assumed the number of existing contracts on a specific year.

\(^{53}\) Value computed over 15% of edp + solar’s expected revenues.

\(^{54}\) The total price of an Energia Solar EDP’s solution comprising two solar panels was computed to be 1,238,67€ considering monthly instalments of 36€ and \textit{time-value-for-money}. Therefore, the margin of 20% represents 247,73 € per household.

\(^{55}\) For the calculation of this cannibalization effect a 10% margin over the hardware price of 102€ was assumed, meaning gains of 10,20€ per service subscription. The gains were computed only considering the hardware’s upfront cost because \textit{Re:dy}’s monthly fees are offered for the first year of subscription and there is no guarantee that service renewal will happen.

\(^{56}\) \textit{Défice Tarifário} results from a maximum price limitation on electricity imposed by law and it is the differential between that imposition and the price stipulated by the energy regulatory entity. In Portugal this differential is endured by electricity companies and counts for approximately 12% being this value translated into losses for them.

\(^{57}\) Despite \textit{Défice Tarifário} corresponding to 12% losses for EDP over electricity, only 6% gains were assumed since 50% of the electricity bill is taxes. For the computations, it was assumed an electricity bill of 80€ – “model household”.
communications & promotions budget was calculated to be 2.000.666€ for the first year, 800.000€ for the second year and 400.000€ and 350.000€ over the following years held alternately (for more detail consult the Communications Plan section and the exhibit 60). For the CAPEX and Working Capital Requirements computation, development costs of 1.000.000€ were considered (see exhibit 61 for further detail) as well as an inventory investment of 5.000.000€ to support future needs.

10.1.7. Other overall assumptions

For computing the final calculations other overall assumptions must be considered. The discount rate was assumed to be 3%\textsuperscript{58} and the inflation was not considered on the P&L since it is assumed that its impact on the project is minor. Moreover, it was applied a corporate tax rate of 21% (Trading Economics, Portugal Corporate Tax Rate, 2016) and interest expenses were presumed to be inexistent because EDP has enough financial resources and does not need to raise debt and, even if it does, it can raise it at 0%. Finally, depreciation costs over hardware were included directly on COGS calculations being not necessary to add a depreciation line on the P&L since there is no extra investments on machinery, for example.

10.2. Results

Considering the previous assumptions, a P&L was built. To better understand this sub section, exhibit 54, 62 and 63 should be analysed in parallel. The sales revenues register in 2018 a value of 2.617.752,36€ reaching the 100.143.738,50€ in 2027. The gross margin is negative until the year of 2024 due to two factors: when calculating pricing the ownership costs were not imputed over the customer (therefore negative margins over the solution were considered); and the fact that COGS are imputed on the first five years of contract as mentioned above. After that year, the gross margin increases exponentially reaching the 55% in 2027 (exhibit 64). In terms of number of contracts evolution, in 2018 \textit{edp + solar} is

\textsuperscript{58} Consequently, the correspondent monthly discount rate is 0,25% and the biannual is 1,49% (compounded rates). The biannual rate is crucial for the calculations since the acquisition process repeats every six months that for the calculations correspond exactly to the first and second semesters of the same year.
expected to sell 26.744 building solutions and 32.516 villa solutions, reaching the 508.154 and 617.840 contracts, respectively, in 2027 (consult exhibit 65 and 66 for further detail). It is also relevant to mention that the number of contracts presents some oscillations, decreasing in 2021 due to the beginning of contract breach behaviour and growth reduction and it increases by a significant amount once again in 2023 since it is within this year that the first contracts reach their end.

Despite presenting a 7,92 years of payback period, which can be considered too costly and not bearable for the company, this only happens due to the conservative perspective over COGS. Therefore, and by presenting a positive NPV of approximately 73.546,650,98€ and a Return on Investment of 1.226%, *edp + solar* presents itself as a good investment opportunity. Moreover, a scenario analysis was conducted taking a pessimistic view (with a lower penetration in the market and a lower positive cannibalization effects) and an optimistic view (with a higher market penetration and a higher positive cannibalization effects). A summary can be found on the exhibit 67, where it can be inferred that, even with different views, *edp + solar* presents always a good investment opportunity reinforcing the conclusion taken before.

11. Control Measures: Key Performance Indicators

To effectively measure the performance of the project, a set of KPIs were selected, that would be carefully tracked during the whole project development and implementation.

**Sales growth** is a crucial measure of market penetration progress, being essential to keep track on the number of solutions sold (both in the building and villa solution).

Additionally, a **market share** analysis would be essential to evaluate the project’s effect on the company’s position in the market. One should take into account that sales and market share are not necessarily dependent on each other, so one should be precise on trying to measure the effective relation (i.e. assess if a market share growth would effectively be originated by this solution’s sales growth).
The project’s Return on Investment (ROI), already predicted to be 1226% in the long run, needs to be confirmed along the process, in order to confirm the projection made.

In terms of brand perception and acknowledgement from the consumer’s part, it would be important to keep track on the Brand Equity, that would reveal the intangible value of the service from a customer’s perspective, revealing the level of brand awareness and the quality of brand image, through the conduction of regular customer satisfaction surveys.

Additionally, a special attention should be given to specific customer tracking KPIs in order to evaluate the attitudes and behaviours of the consumer towards the brand and therefore analyse the effects of those in the business development. For this purpose the following metrics were selected: Customer Lifetime Value, the projected net profit of a consumer relationship (taking the present value of projected future cash flows from this relationship); contract renewal, measured every five years as the percentage of contracts signed in a certain period of time that would be renewed at the end of the contract; cost of customer acquisition (price paid to acquire a new customer), reached by dividing the total costs of acquiring new customers by the number of new customers, within a specific time frame, being this value expected to decrease over time; and sales team response time, that would function as an internal measure of edp + solar sales team, consisting on the tracking of inbound and outbound calls and measuring how quickly the team responds and effectively solves the customer’s problem (which can also be retrieved from regular customer satisfaction surveys).

12. Contingency Plan

In alliance with edp + solar implementation strategy, unexpected events that could jeopardize the service’s success in the market must be taken into account. Therefore, a contingency plan was created, taking into account the possibility of certain events’ occurrence, their effect on the business development and the design of effective response actions.

- **Low Sales Growth**: penetration in the market did not achieve the defined goals, low
return on investment, negative impact on market share.

**Action Plan:** market analysis to detect the origin of the low sales growth; marketing strategy finetune and implementation.

- **Low Customer Satisfaction:** negative effect on brand’s reputation, lead to non-contract renewal, might affect future sales (word of mouth).

**Action Plan:** improve customer service (channels’ audit and restructuring if necessary), do regular customer satisfaction surveys.

- **Tangible Items Price increase:** longer period with negative net profit, increase on customer’s rent or decrease company’s margin.

**Action Plan:** negotiation with suppliers.

13. **Why we think edp + solar will work**

The path of the future of global energy is still uncertain, however some trends seem to be rising. More and more electric cars are being produced and are seducing consumers while factory production and raw materials are becoming more efficient and less pollutant. Solar panels and batteries are decreasing in price which will create “Island grids” and independent communities that will be powered by green energy and disconnected from the grid.

*Edp + solar* is a service that leverages these trends and will be on the vanguard of renewables trends in the world. Although starting in a small country like Portugal, it has the potential of being an example for other countries, specially by offering the opportunity of combining the main service of renting solar panels with other components such as batteries and smart meters, that will help consumers save on the energy bill and help with the environment.
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1: Art.º 8.º, al. h), Decreto-Lei n.º 153/2014, October 20;
2: Art.º 9.º, Decreto-Lei n.º 153/2014, October 20
3: Art.º 31.º, Decreto-Lei n.º 153/2014, October 20
4: Art.º 31.º, n.º 5, Decreto-Lei n.º 153/2014, October 20
5: Art.º 30.º, n.º 1, Decreto-Lei n.º 153/2014, October 20
6: Art.º 2.º, n.º 1, Portaria n.º 15/2015, January 23
7: Art.º 2.º, n.º 2, Portaria n. 15/2015, January 23
8: Art.º 3.º, n.º 1, Portaria n.º 15/2015, January 23
9: N.º 2, Despacho n.º 3/SERUP/DGEG/2015, March 3
10: Art.º 19.º, n.º 1, al. a), Portaria n.º 14/2015, January 23.