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POWERED BY MY OWN ENERGY: BAIRRO SOLAR EDP, YOUR SOLAR ENERGY FOR THE NEIGHBOURHOOD

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Abstract

The recent law decree 162/2019 opened the door to numerous opportunities within collective self-consumption projects in Portugal. The ever increasing need to adopt sustainable practices results in significant impacts and business opportunities that EDP Comercial may benefit from. This study examines the best approach to introduce solar communities in the Portuguese market by exploring possible business models and developing a coherent marketing strategy. In order to provide a better answer to these questions, semi-structured interviews with 30 participants and a questionnaire with 201 valid responses were conducted to gather insights and support the decisions.

Keywords: Solar communities; solar energy; marketing strategy; collective self-consumption; EDP Comercial.

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1 Market Overview & Situation Analysis

1.1 Energy Outlook

1.1.1 Energy Demand and Implications of the Pandemic

The global energy demand has been increasing since 2011, but in 2019 the rate of growth was 0.9% - significantly below the average rate of the past decade, and less than half the growth registered in 2018 (Exhibit 1). This behaviour in the demand for energy is mostly justified by the slowdown of the global economy, marked by a fall in Gross Domestic Product (GDP) growth of 0.7% from 2018 to 2019, and milder weather conditions (International Energy Agency 2020). Nonetheless, a recent estimation by the International Energy Agency projects global energy demand to increase by 30% until 2040, driven by an expansion of the global economy and population, as well as a growing urbanization process (Newell et al. 2020; EDP 2017).

Covid-19 took a toll in society's form of living and triggered an unprecedented economic jolt with profound consequences around the world, the energy market was no exception. Reports have shown that global energy demand declined by 3.8% in the first quarter of 2020 and it is potentially set to fall to 5% (IEA, 2020a). This major decline was only seen in times of the Great Depression, in which impacts are more noticeable in the European Union and the United States (Exhibit 2). After further research, it was concluded that each energy source was impacted differently. Coal demand was stated to be hit the hardest - an 8% decrease compared to last year, followed by oil demand that fell by nearly 5% in the first quarter of 2020 and gas demand which was moderately impacted with a 2% decline (IEA, 2020b). This explains the overall downfall of the total energy demand; however, one particular source of energy seems to have beaten the odds: renewable energy (Exhibit 3).

Renewable energy is the only to present growth in demand. The growth is explained by a chain of events, in which the electricity demand depression ranging from 15%-30% during lockdown triggered a lift on the share of renewables, while grid operators sought for the cheapest supply

sources as a response to the unbalanced demand. Consequently, other sources of electricity, more polluting and costly such as coal, gas and nuclear power, fell behind. Renewables output is significantly unaffected by demand. This is mainly because, even during a pandemic, wind and solar farms will not be shut down (World Economic Forum, 2020). However, a question stands as to whether this growth will remain or not. Some studies foresee the future with a positive note, believing that the lockdown provides a great opportunity for the energy sector, in which governments and businesses can encourage a greener re-start (World Economic Forum, 2020). Renewables are in constant innovation, for instance solar cost had a 82% reduction in the past 10 years (IRENA, 2020). Hence, investors are becoming more prone to finance newer power plants. As of last year, 72% of all power expansion was accounted to be renewable.

Moreover, policies and regulations are more and more favourable towards cleaner sources as governments are increasingly pressured to achieve certain sustainable goals, and, as previously mentioned, these sources being cheaper may act as an incentive (World Economic Forum, 2020). Despite this, other studies do not show a positive aftermath. 2019 was a good year for renewables, having performed close to what was predicted, with a 7% increase in new installations compared to 2018. After such a strong year, 2020 was expected to hit new records. Further policy was expected to be set to achieve 2030's renewable goals, though, with the new risks prompted by Covid-19, there were market disruptions and delays and even the cancelling of new builds which included renewable projects. Thus, 2020 is set to build fewer wind turbines and solar plants. On a smaller scale, households facing financial stress and economic uncertainty might postpone or simply abandon their intentions to install solar panels (IEA, 2020c). Overall, as Dr Fatih Birol, the International Energy Agency (IEA) Executive Director, said "The resilience of renewable electricity to the impacts of the Covid-19 crisis is good news but cannot be taken for granted" (IEA, 2020c), meaning even though the trajectory is positive, an added effort is required to put global energy on a sustainable development path.

Finally, government decisions guide about 70% of the world's spending on energy (Economist, 2020), it is quite clear that it is the government's responsibility to stimulate investment in renewables to mitigate climate change, thus, ensuring the rise of renewables remains.

1.1.2 Energy Prices

Naturally, lower demand for energy sources is having a tremendous impact on energy companies and on the value chains of the industry, triggering a subsequential reduction in the prices of these outputs (Cohen, 2020a). This is causing cascading effects on every source, for instance in the West Texas Intermediate (WTI) the crude price fell to an unbelievable negative price of ($37.63) a barrel during lockdown, bearing in mind that it used to be close to $20 a barrel. The same happened to oil, natural gas and electricity prices. In fact, electricity prices dipped below zero in the United States of America, Germany, Denmark, and France (Cohen, 2020b).

Regarding the European electricity markets, because of demand decrease, the first-half of 2020 average price was the lowest of all semesters since 2011, reaching prices lower than €30/megawatt hour (MWh) in most countries, having decreased from €60/MWh (AleaSoft, 2020). The price recovery started only around May due to the start of the de-escalation of the confinement measures, which led to an increase of electricity demand, hence the price increase (Exhibit 4). On top of the deconfinement process, the increase of CO2 prices and less nuclear energy production also explain the change in trend posed by the prices, which foresees a positive recovery for the future of the electricity market (AleaSoft, 2020).

In terms of the **consumer perspective**, reports have shown that electricity prices for households in Portugal have substantially increased. In 1991, for instance, the price was €0.1120/kilowatt hour (kWh) and today it is €0.2120/kWh (Pordata, 2020). Consequently, one should verify how people reacted towards these changes in electricity prices. From the results of a study that includes data from 5 independent surveys over the period 1989 to 2010, it was concluded that households tend to have a **high medium/long-run price elasticity**. This suggests that an

increase in the price of electricity would reduce the use of electricity. Furthermore, it also validated that elasticities vary significantly depending on the income group. This indicates that political reforms in the electricity sector may have an important redistributive effect (Susana Silva 2017). The time frame of 1989 to 2010 may seem outdated, however, this period was marked by major changes in the country, namely the economic crisis, leading to a parallel association with the existing crisis of 2020 due to the Covid-19 disruption.

1.1.3 Solar Surging

Renewable energy sources (e.g. hydric, wind, photovoltaic) are obtained from natural resources (e.g. rivers, wind, sun) that are regularly replenished in a sustainable way (Agência Portuguesa do Ambiente, 2019). A conscientious pressure from international institutions and national governments to meet climate change objectives, (e.g., Renewable Energy Source (RES) Directive), and the growing global environmental concerns, coupled with the decrease in technology costs, are pressing forward an increase in the share of RES in the global energy mix – progressively declining the weight of fossil fuels such as coal and natural gas. In 2019, the share of renewables in global electricity supply was 27%, the highest value ever recorded (International Energy Agency, 2020).

At a recovery stage of the pandemic, mitigating global warming through the replacement of polluting energy sources – which account for two thirds of the world's greenhouse gas emissions (Economist, 2020) – with clean and reliable energy might be the path to achieve sustainable development. In fact, with a global capacity of 593 gigawatts (GW) in 2019, corresponding to a 14% increment from 2018, solar energy has been the RES displaying the highest growth over the last decade (Exhibit 5), while all estimates indicate a staggering increase in this source's electricity generation for the following years (Exhibit 6 and Exhibit 7). While fossil fuels are exhaustible and limited, solar is the most abundant energy source on the planet – theoretically, it has the potential to fulfil the entire world's demand for energy if the technological advancements permitted it.

Moreover, solar is superior in terms of efficiency, availability, and cost effectiveness (Kabir et al., 2018), making it the most promising RES for the future.

1.1.4 The Portuguese Market

Nowadays, the domestic primary energy production in Portugal is almost solely based on RES, such as hydro, solar, wind, geothermal and biomass energy. These sources naturally and consistently renovate themselves, hence, besides decreasing the greenhouse gas emissions, it also decreases Portugal's dependency on the import of energy, further reducing Portugal's need for other markets (REA, 2019). In fact, in May 2020, RES represented 71.6% of the electricity production mix in mainland Portugal (Exhibit 8) (APREN, 2020).

To get a broader perspective, from January to August of 2020, 57.6% of the energy produced was renewable, whereas 34.8% was non-renewable and lastly 7.5% was imported (Exhibit 9) (REN, 2020). Portugal was no exception to the demand decrease caused by Covid-19; however, studies show there has been a production recovery, more noticeable in the natural gas, during July and August (Exhibit 10) (APREN, 2020). For future steps, in line with National Action Plan for Renewable Energy for 2020, the "Green Growth Commitment" sets the goal to reinforce renewable energy by setting a target of 31% of renewable energy in gross final energy consumption by the end of 2020 and 40% by 2030 (REA, 2019). Portugal already managed to reach the 2020 goal by 2018 (Exhibit 11) (European Comission, 2019), however it is hard to judge whether the upward trend on renewables will be enough to reach the 2030 goals.

The Iberian Electricity Market (MIBEL) is constituted by Portugal and Spain. Regarding prices of the MIBEL market, until June 2020, the market averaged €29.06/MWh and €29.00/MWh respectively, having the highest prices in the European market during this period. However, there was still a severe decrease in prices for the MIBEL market in the first semester of 2020. The average price decreased by 33% in Portugal and 34% in Spain. Furthermore, when compared to the first semester of 2019, the decrease in both cases was of 44%. The unprecedented price decline was mainly prompted by the confinement measures to mitigate the

spread of Covid-19, in which Portugal reached its minimum monthly price of €17.77/MWh in the month of April. The price recovery was only noticed in May, increasing by 20% for the MIBEL market. This may be explained by the deconfinement measures, the lift of CO2 prices and the decrease in nuclear energy production. Consequently, in June, the price rose by 43% in the Portuguese market, allowing a price of €30.64/MWh (AleaSoft, 2020).

1.2 Energy Transition

Electrification has been a growing trend in the world over the last years, and as the role of electricity expands, 2020 marks the imperative starting point towards a more "*inclusive, sustainable, affordable and secure energy system*" (World Economic Forum, 2020).

The current energy transition is characterized by disrupting technologies and large investments in the power sector, particularly in renewable sources of energy. Utilities in Europe are adopting a new strategic vision, re-orienting their businesses by channelling their retained earnings towards auspicious new business models (IEA, 2017). Overall, the power sector is being impacted by a major transformation based on three main variables:

(1) Decarbonization is driven by the increase share of renewable sources of energy, which is acknowledged as the most scalable and affordable solution (EDP 2019) to accomplish a full electrification of the economy. Supported by the Paris Climate Agreement (European Commission, 2018), electrifying the economy through renewables is not only fundamental to achieve emissions neutrality but is also a key driver of energy efficiency. Portugal is a world leader in the integration of renewables in the energy mix, highlighting in particular wind and solar sources of electricity generation. The country's "National Energy and Climate Plan for 2030", and "Roadmap to Carbon Neutrality by 2050" lay the foundations for the full electrification objectives, in which the government and utilities play an important role in the development of the sector in a cost-effective manner (IEA, 2020).

(2) Decentralization of the energy system is becoming more relevant with the potential shift to "*behind the meter*" technologies – instead of having one big energy production site, there

will be multiple smaller sites distributed between the customers. This enables end-users to satisfy their energy needs through distributed generation of energy, while reducing the production and operation costs in the power system and minimizing emissions (Bayram and Ustun, 2017). Decentralization makes customers active elements of the energy system (World Economic Forum, 2017) and arrives as a natural outcome to inefficient regulation, lack of investment incentives, and as a security of supply (EDP 2019).

(3) Digitalization is transforming every facet of the industry value chain, particularly the relationship with customers. A requirement and supporter of the other two trends, digitalization enables higher control, real-time optimization of consumption, production and operation of the system, and customer interaction (World Economic Forum, 2017). Digitalization improves efficiency in the energy sector through a combination of several technologies. New players are emerging in the sector with innovative and disruptive business models, changing the market dynamics by allowing higher flexibility and empowering the energy consumer. See Tesla's example in Exhibit 12.

2 Five C's Analysis

2.1 Context – PESTLE

2.1.1 Political

Portugal is a politically stable country and the main electoral parties have been setting energy revolution as a must in its agendas. In 2019, most of the parties mentioned the green prerogative in the electoral programs of the represented parties on the Portuguese assembly and, in some cases, it was the central message of its political campaign (PAN, 2019; EsquerdaNet, 2019). Homeowners in Portugal can apply for incentives to make their homes more energy efficient through the government's Fundo Ambiental scheme, which opened in September 2020. It will pay 70% of the cost of the energy efficient improvements, up to different maximum values depending on each project.

The Portuguese Ministry of the Environment and Climate action has proclaimed that the incentives will be assigned on a first-come, first-served basis and *a posteriori*, which means that the installation of solar panels must be completed first to be accepted (Fundo Ambiental 2020). The Secretary of Energy, João Galamba, announced that the collective self-consumption projects will benefit from paying 50% of the costs of energy policy and general economic interest (from now on mentioned as CIEG) (Eupportunity, 2020).

2.1.2 Economic

The European Stability Mechanism (ESM) reported a 2.2% GDP decrease in 2019 in Portugal; according to the Economic and Social Stabilization Program, the Portuguese government estimates a decline in 6.9% in 2020 and a further increase of 4.3% in 2021 (European Stability Mechanism, 2020). The 2021 forecast is well below the projection by the European commission of 6.3%. Unemployment in Portugal hit 8.1% in August 2020, with 417,000 people out of work. This value has increased by 25.7% from August 2019 (INE 2020). Portugal has a minimum wage of €635 a month, the lowest in western Europe, yet, it is estimated that it will rise to €750 by 2023 (Orçamento do Estado 2020).

In terms of environmental matters, the Strategic Vision for the 2020-2030 Portuguese Economic and Social Recovery Plan proposed by António Costa Silva stresses that the country needs to invest tree times more in renewable energy in order to guarantee an effective climate transition in the post-COVID era (Costa Silva 2020). The Secretary of Energy highlighted that the solar communities represent not only an environmental opportunity but also an economic one, since Portugal imports nearly 80% of the energy consumed (Eupportunity, 2020).

2.1.3 Social

The UN projects a population increase from 7.7M people in 2019 to 11.2M people by the end of the century (Roser 2013). Considering the trend stated before of electrification it is quite clear that with this massive increase in people, a rise in energy production must follow closely behind.

The Future 100 study (Wunderman Thompson 2020) forecasts that neighbourhoods are evolving into sharing more than just the same geographical area, stating them as "self-sufficient energy syndicates, communal ownership cooperatives, cross-generational social hubs and farming collectives" (Wunderman Thompson 2020). Society is getting used to a communal way of living, whether creating groups for shared Netflix accounts or only being able to access a given platform, such as Uber, if they are part of a network of users. Moreover, 76% of the Portuguese population claims that they are very concerned about climate change and protecting the planet (ECO, 2020). On top of that, a study conducted by Nielsen (Nielsen 2015), found that, within Millennials, 73% are willing to pay more for a sustainable brand, up 23% in comparison to 2014. Nevertheless, 1 in 4 people aged 15-29 in the EU live in a rented house meaning that they are unlikely to produce their own solar energy (Eurostat, 2019).

2.1.4 Technological

Innovating and pioneering projects are being created and introduced to the market at lightspeed. Energy transition and technology innovations are inseparable issues which should be tackled together. There are developments in technology that have built progresses in photovoltaic cells, smart meters and in solar Redox batteries. In fact, a new concept of batteries has arisen - flow batteries - that could help sustain the entire electric grid. In a world dominated by apps and GAFA (Google, Amazon, Facebook, Apple), customer data is a precious resource. Noteworthy is that 1 in 5 Portuguese never had access to the internet (European Commission 2020).

Still, people are now more connected than ever, and the market must evolve accordingly. Hence, 5G is planned to enter Portugal in 2021 and will most likely play a crucial role in the reduction of the carbon footprint as it requires much lower energy for the same volume of data and it is believed that it can reduce up to 90% of the world's current power consumption (Dunne, 2019).

2.1.5 Legal

The energy market is regulated and controlled by the Entidade Reguladora dos Serviços Energéticos (ERSE). Anything from electricity, natural and non-natural gas, oil, and biofuel as

well as managing the network for electric mobility is done by this entity. In October 2019, a law was published aiming to create a new regulation framework for solar self-consumption systems, introducing new concepts like collective self-consumption and communities.

Law decree 162/2019 intends to transpose legal framework of 2018/2001 European Community Act. The previous legal framework for solar only allowed self-consumption (SC) on a single-client basis, meaning that one electric consumption installation implied one and only one solar self-consumption system. A breakthrough on the new law is allowing to group more than one solar self-consumption system with one or more electric consumption install. In legal terms, one person can join two communities with two different houses, even though a singular house can only be linked to one community. These communities will be approved on a case-by-case basis by DGEG (Direção Geral de Energia e Geologia, General Directorate of Energy and Geology in english) considering, among others, the associated tension levels or any technical or regulatory element (Diário da República 2019, Article 5.2). The referred entity will take up to 2 months to legally authorize a solar community union, according to Manuel Valença, legal representative at EDP Comercial (EDP).

Furthermore, all members will have to sign internal regulations which will assure, for instance, how an individual can become a member in a collective self-consumption or be expelled from it and the way energy will be split across the members (Diário da República 2019, Article 6.4). In our proposed solution, EDP will play the Management Entity of Self-Consumption (EGAC) role (Diário da República 2019, Article 6.5). Considering the innovative nature of solar communities, regulation is still under development and it will be finalized by the ERSE and DGEG until the end of 2020.

2.1.6 Environmental

The EU aims to be climate-neutral by 2050 – an economy with net-zero greenhouse gas emissions. This goal is at the heart of the European Green Deal and in line with the EU's commitment to global climate action under the Paris Agreement (European Commission,

2018). The transition to a climate-neutral society is both an urgent challenge and an opportunity to build a better future for all.

As previously mentioned, in the first quarter of 2020, global energy demand decreased by 3.8%. The aftermath of the pandemic could prove even worse for the planet. As lockdowns are lifted and the world starts going back to normal, the urgency to get the economy back might overrule all the green efforts of the past years. In the initial aftermath of the global financial crisis of 2008, global CO2 emissions from fossil fuel combustion and cement production decreased by 1.4 percent, only to rise by 5.9 percent in 2010 (Wilkinson and Téllez Chávez, 2020). It is imperative that governments act to protect their people from environmental harm — and this includes addressing climate change. However, before governments can act, companies must try and find solutions to these dramatic issues. Portugal, as many European countries, has developed a plan on how to get to carbon neutrality by 2050. The strategy implies that "energy production and consumption will (…) [be] based on endogenous and renewable sources of energy" (República Portuguesa et al., 2019).

2.2 Company

The utility company Energias de Portugal (EDP) was established in 1976 and has built up into a multinational, vertically integrated company with a relevant position in the world energy market. With the **vision** of being *"a global energy company, leading the energy transition to create superior value"* (EDP Energias de Portugal, 2018), the company controls the entire electricity value chain and is, also, in the gas market. Production, transportation, distribution and trading of electricity are at the core of the company. With about 11 700 employees in 16 countries, the company achieved a turnover of around €14.3M in 2019.

The group is divided into four different companies: EDP Produção, EDP Distribuição, EDP Renewables and EDP Comercial. The latter will be the only one further developed due to the applicability of this thesis. The company is currently focusing on three business areas, namely: **Renewables** as its key growth platform (61% of EBITDA, 53% of CAPEX), **Networks** as

portfolio stabilizer (26% of EBITDA, 41% CAPEX), and **Client Solution & Energy Management** (13% of EBITDA, 6% of CAPEX) (EDP - Energias de Portugal, 2020).

Due to the coronavirus pandemic, EDP disclosed a 22% decline in net income in the first half of the year, which was caused by a sharp drop in energy consumption in the Iberian Peninsula and Brazil (Reuters, 2020). The widely communicated values of the company are **Innovation**, **Sustainability** and **Humanization** focusing on their aim to create value in the areas they operate, to improve the quality of life, and to build long-lasting relationships with employees, customers, and partners (EDP Energias de Portugal, 2018).

2.2.1 SWOT

A SWOT analysis for EDP was conducted to analyse internal strengths and weaknesses as well as external opportunities and threats (Exhibit 13).

2.2.2 Current Product Portfolio

EDP's goal is to generate, distribute and supply energy while controlling the entire supply chain. EDP offers a range of different products and services ranging from health insurance ("Plano EDP Saúde") to natural gas. Besides offering electricity (renewable or not) and appliances (including air conditioning, water heating, etc.); within the electric mobility category, it also provides gadgets for people looking to charge their electric vehicles at home ("Wallbox Casa EDP"), whether in a condominium or in a house (EDP Comercial, 2020).

2.3 Competitors

Given the extent of this project, the latter section will focus on the private sector only. For the purpose of assessing the degree of competition, the following section examines the **number of competitors** and the **market concentration**. The electricity sector in Portugal is widely liberalised and privatised. In total, there are **31 electricity suppliers** competing in the private sector that include EDP, Galp, Endesa, Iberdrola, Gas Natural Fenosa, Goldenergy and Energia Simples (Carneiro Pacheco and Marques Mendes, 2019).

The Herfindahl Hirschman Index (HHI) of the Portuguese electricity market corresponds to 0.91 and 6,251 (ERSE 2020). This demonstrates a **highly concentrated marketplace**[1] meaning that only a few suppliers in the market represent a large percentage of the market share. With a market share of 74% in the final consumer segment, EDP has been the market leader in Portugal for many years. The three main competitors are Endesa (7%), Iberdrola (7%), and Galp (5%) (ERSE 2020). When calculating the 4-firm concentration ratio (CR) to assess the industry concentration and thus the degree of market control, it is remarkable that these four largest suppliers account for 93% of the market in terms of number of customers[2]. Therefore, the Portuguese energy market can be considered as highly concentrated[3], meaning that these four firms have significant market control.

The competitors occupying the top 3 of electricity providers in Portugal - along with EDP - were examined more closely and a recent competitor from the largest telco brand in the country, MEO, due to its large customer base and diversified portfolio (Exhibit 14).

2.4 Customers

Since 2013, consumers in Portugal could freely choose and switch electricity providers. By then, there were almost 6.4 million electricity users in the country (Pordata, 2020) consuming more than 46 billion kWh (PORDATA, 2018). Until 2018, the number of consumers rose to 6.5 million, including 5,6 million people in domestic consumption. The total consumption amounted almost to 49 billion kWh (Pordata, 2020). Regarding solar energy, in 2019, there was 220 MW (Megawatt) of installed solar photovoltaic power in Portugal, resulting in an overall solar production of 1.395 gigawatt hour (GWh). This was a great year since it increased

[1] An HHI smaller than 1,500 represents a competitive marketplace; an HHI between 1,500 and 2,500 a moderately concentrated marketplace an HHI larger than 2,500 a highly concentrated marketplace.

[2] 4-firm CR = 74 + 7 + 7 + 5 = 93.

[3] A CR of 0-50% may be interpreted as low concentration; CR of 50-80% as medium concentration; CR of 80-100% as high concentration.

more than 30 MW from 2018, which only had 86 MW of photovoltaic solar production (Sönnichsen, 2020). From 2020, up to September, 1021 GWh was generated through solar (APREN, 2020). In terms of EDP's contribution to solar capacity, the company has installed a capacity of 1.164 MW in Portugal in 2019. (EDP, 2019). Regarding the major energy transition trends, namely less centralization in energy as well as an increase in digitalization, consumers are attributing more importance to the ease of access and energy self-sufficiency – demanding higher levels of convenience from providers (Accenture 2015).

The new energy consumer is more informed, more technological, and expects more choice and control. A consumer evolves into a **promasumer** since he/she is not only **producing** but also **managing** and **consuming** its own electricity (EDP 2017). In a world that is increasingly moving online, digitisation is the theme of the moment. Understanding how the new digital consumers live and work will be crucial for companies to develop and implement innovative business models that focus on delivering a fully connected experience.

As new players enter the energy market (e.g. telecommunication companies) leveraging consumer information to provide valuable recommendations to customers (Accenture 2015), utilities need to remain relevant, and find innovative ways to create value and drive engagement. The appearance of new technologies and devices such as smart meters and sensors is allowing utilities to collect and analyse data about customers' consumption and interaction with energy (Hughes 2017). Leveraging behavioural insights facilitates the creation of customer profiles and the comparison between households, giving energy companies the opportunity to estimate and simplify energy demand, in a time where "as-a-service" business models are gaining momentum in the sector (Accenture 2017).

2.5 Collaborators

Regarding close collaborators, EDP relies on more than three Chinese-based **suppliers** to provide its services as EDP outsources PV (Photovoltaic) solar panels, inverters and proper structures. These are external organizations that work with EDP but are not part of the firm.

The same occurs with warehousing, distributing and maintenance which are provided by **subcontracted companies**. EDP also collaborates with several **advertising agencies**, to build advertising campaigns. As for other partners, EDP has been running a **partnership** strategy in order to create "a virtuous ecosystem" with different players from different sectors like gas stations, hotels and football clubs. Specifically, BP, Pestana, Vila Galé, Benfica and Efacec - the latter is a technology solution collaborator for business fleets, shared condominiums and car parks (EFACEC 2018) - are being considered as collaborators (Pereira 2020a).

The company has also established a partnership with electric car brands, such as Audi, BMW, Hyundai, Mercedes, Mitsubishi, Nissan, Peugeot, Renault, Toyota, Volkswagen and Volvo (EDP 2020b). Moreover, the new app "EDP Zero" – launched in September 2020 with a campaign entitled "Geração Zero" – comprises additional partnerships since it offers experiences and a Smart EQ fortwo to clients in exchange for a certain level of sustainable practices (PMS 2020 2020). Apart from this, EDP collaborates in areas other than energy and has a significant investment in **culture** as naming sponsor of summer festivals: EDP Cool Jazz and EDP Vilar de Mouros (EDP 2020a).

3 Development of a business model for Solar Communities

3.1 Communities EDP

As previously mentioned, Portuguese legislation has recently developed to allow people to share, buy and sell energy. Given this, EDP saw an opportunity to launch a new service in the Portuguese market that has the potential to revolutionize the access to solar energy, called **solar communities**. In this case, there is at least one **producer** for a certain number of **neighbours**, which may vary according to size of the community. More detailed information will be further explained in the Product chapter, the first *P* of the marketing mix.

The concept of solar communities is not fully defined yet, where some aspects, such as ownership of the panels, maintenance costs, contract duration with the utility, etc., may then

vary depending on the possible business models to be considered. A SWOT analysis for EDP's Solar Communities can be seen in Exhibit 15.

3.2 Potential Business Models

Osterwalder and Pigneur (2010) describe a business model as "the rationale of how an organization creates, delivers and captures value". To better understand the relationships between its components, the research team studied potential strategies according to the industry standards, and benchmarked current EDP strategies against other companies in the same industry, specifically Tesla (United States) and Sonnen (Germany).

The following subchapter ought to provide an overview of the four viable business models to offer solar communities on the Portuguese market (Exhibit 16).

3.2.1 As-a-Service

In this case, EDP is responsible for the installation and maintenance of the solar system, while maintaining ownership of the panels that are put on the customers' roofs. EDP plays a role as the entity that manages the community. The photovoltaic panels are installed for free on producers' roofs. The self-consumed solar energy is sold at a discount and the unused energy is injected into the grid, meaning that EDP sells that energy to the electricity grid. Just like in the subscription model (further explained below), a removal fee is charged.

Members pay the energy proportionally to consumption. Producers have a contract commitment for 15 years and save more than the neighbours. Neighbours, who are allowed to easily leave the community without any penalty, would have a tariff discount of 20% on the self-consumed energy whereas producers have 40% (EDP 2020c). This solution allows customers to install solar energy with no upfront costs.

3.2.2 As-a-Service with Minimum Fixed Value (MFV)

In addition to the above-mentioned features of the As-a-Service model, this strategy adds a fixed minimum charge – a minimum value to be paid only in case consumption does not reach a pre-determined amount each month. This way, the charge would only be applied if the

customer's consumption is extremely low when compared to the monthly average. This reduces the risk for EDP, as the company still receives a fixed minimum value. An example would be months in which customers go on holidays – e.g., a household that usually pays around thirty euros per month on solar energy goes on vacation. Thus, solar energy consumption drops to nearly zero on that specific month. In this scenario, a minimum charge of ten euros (roughly) would be applied. Another scenario would be if someone joined a solar community and did not consume energy. Such performance would be preventing another customer from becoming a member and, in turn, saving on the electricity bill. In this matter, the minimum charge not only aims to reduce EDP's risk but also to impose responsibility on its members.

3.2.3 Subscription Payment

This business model is inspired by Tesla's rental program (Tesla 2020b) in which consumers rent the panels in a monthly payment scheme with prices starting at around €25/month. Therefore, customers do not own the panels. They pay the same amount each month not depending on how much they consume. There is no cancellation fee despite having a removal fee to cover EDP's cost of uninstalling the panels if consumers would like their system removed. In this case, customers have more risk since, for instance, when on holiday, consumers must pay the subscription even though they might not be at home.

By subscribing to a solar community, EDP's customers (neighbours and producers) pay a monthly rate for the use of a solar panel system that is installed for the community use. It allows the community members to adopt solar energy without high upfront costs of purchasing a solar panel system for everyone, meaning they can start saving immediately. In this scenario, EDP would own and maintain the system.

3.2.4 Transactional Model

Another business model considers the fact that customers prefer to be independent from their energy supplier by owning the solar panels. This option requires an initial investment of approximately €10,000, depending on the number of panels. Current market prices in Portugal

average around €759 for a 400 W panel and Portuguese houses have on average 2.44 panels, as stated by the EDP team. The energy produced by the panels is consumed for free by the neighbours and the producer(s), and the unused energy is sold to the grid.

Transactional customers pay the full cost upfront which includes solar panels and any other necessary hardware and installation costs. Residential end users may not have sufficient money on hand to fund the initial installation costs of a solar community. Thus, financing in the form of a purchase agreement could be addressed by the utility. As opposed to the business models mentioned before, the management of the panels – including installation, maintenance, and other future issues with the panels – is within the responsibility of the community and not EDP.

3.3 Potential & Risk Assessment

To evaluate the strategic risk-potential of the four business models to EDP, an assessment matrix was developed. Different indicators were chosen to analyse both potential and risk. After identifying the aforementioned criteria, different weights were assigned based on the importance for EDP and a potential implementation of the business model. In order to appraise the various business models, the criteria identified for each individual model were then examined and rated from one to five (Exhibit 17 and Exhibit 18).

Amongst others, the criteria in question include such items as “payback security”, “revenue to EDP” and “asset management”. A matrix was drafted as means to have a visual representation of each business model’s positioning in terms of both risk and potential (Exhibit 19).

Firstly, it is important to assess the **potential** part of the matrix (Exhibit 18). Both the **service with and without MFV** share the same potential value. It is expected that both will reach the market in one to two years and provide a steady revenue flow for EDP. Moreover, these both align with the brands’ current positioning by offering much more than just electricity and aiming to play an active role on people’s lives. In the indicator of the potential market and customers’ acceptance, whilst the service with MFV offers a bigger market, it has a lower acceptance as customers might not be as willing to join due to the mandatory fee (in case of

low consumption); in the service business model, the opposite happens. Without the mandatory fee, people are eager to adhere, but the market possibilities decrease as the communities with lower consumption must be excluded.

The **transactional business model** could go into effect right now, mostly due to its lack of complexity as it is only a matter of selling the panels to a previously established community. In this case, revenue to EDP is much lower than in the previous cases as it is a one-time offering. Following that thought, the possibilities to cross sell and further extend EDP's brand are also quite diminished. Finally, customers' acceptance to form and manage a community on their own accord is too arduous of a process and will not be accomplished to such an extend where it justifies the existence of a market for said business model.

Finally, the major upside for the **subscription model** is the expected revenue that this model might generate. However, it is not in line with the brands current positioning at all as the $1,500 removal fee represents the exact opposite of what EDP aims to convey with the solar communities.

It is essential to also understand the **risk** (Exhibit 17) and how it impacts the final choice for the proposed business model. In this case, the two models service and service with MFV share almost the same risk; they are similar in everything but one indicator – payback security. The reason why is obvious, the MFV implies the literal definition of payback security – it guarantees a portion of the money back every month consumption is lower than usual. Payback period as well as payback security is easy to understand as the assurance of the monthly payment makes this amount of time shorter or longer depending on the model. The service is the one with the longer payback period whilst the transactional as it is a one-payment option has the smaller time frame; then both the subscription and the service with MFV have an assured monthly payment making it less risky for EDP. The required investment of EDP in these services is high as most, if not all, of the investment is done by it. EDP is responsible for installation,

maintenance of the panels and the management of the community whilst in the transaction business model the previously assembled community is the one responsible for the investment. In terms of rivalry, the threat of replicating the business is smaller when compared to the transactional model, as the logistics and bureaucracies of maintaining a community are too cumbersome to easily copy. This train of thought applies to service, service with MFV and the subscription model. Concerning ownership of the panels, or asset management, the only case where EDP does not own the panels is in the transactional business model. Another indicator used to determine the best model is their complexity to develop; this includes the entire process from beginning to end and it includes areas such as R&D, marketing, finance, etc. That is why the transactional model gets the lowest score – it is easier to come up with a strategy to sell panels to the final consumer. On the other side of the spectrum, there is both service and service with MFV; with the managing of the community and developing a clear marketing strategy this service offers many hurdles and it is therefore harder to develop. Finally, the last indicator is the exposure to the electricity tariff which differs from model to model. For EDP, the variation of the tariff might arise some issues. Namely, the inconsistency of the monthly payment from the customer makes it harder to correctly assess the possible return on investment (ROI), moreover it might also negatively impact the return if the tariff decreases for an extended period of time. Therefore, the exposure is accentuated in the model where no assured monthly payments exist – the service – and the level of risk decreases soon after; it is the smallest on the transactional as there are no interactions between customer and EDP after the purchasing of the panels, followed by the subscription model and the service with MFV.

Once the weights of each indicator were determined with the EDP Team, the overall Risk Potential Matrix showed that 3 out of 4 business models were placed in the **Question Mark** quadrant. This result means that the As-a-Service, As-a-Service with the MFV and Subscription models have the highest potential but also the highest risk. Although having the lowest risk

(1,69), the transactional model would only serve a niche market, which makes this option the one with the lowest potential.

After studying the market research results, the research team concluded that, with the transactional model, EDP would be not only face hardships in finding enough neighbours to form a solar community but it would also be competing with retailers. Nevertheless, this model could be tested at a future stage of the service's life cycle, such as in the maturity phase. The research team recommends implementing the **As-a-Service model** (placed in the Question mark quadrant showing a potential of 4,59) with the option of a **minimum fixed value** since most customers are risk-averse regarding solar energy and EDP expertise would increase likelihood of adoption.

4 Primary Research

Primary data was collected to gather the necessary information to address the management decision problems.

4.1 Management Decision Problems and Research Problems

One of the major aims of this study is to give guidance to EDP on the best way to introduce collective self-consumption in the Portuguese market to maximize its adoption, customer acquisition and financial performance while reducing the company's risk. EDP aims to provide a new service that has never been launched in Portugal before. In fact, there are no previously collected information, thus making it essential to enforce the following *management decision problem:* **How to launch solar communities*?***

In launching a new service, it is crucial to understand what the previously existing biases and perceptions of consumers in the subject are. Specially, regarding sustainability matters in which people tend to feel a certain social pressure to be ethically moral. Specially, regarding sustainability matters in which people tend to feel a certain social pressure to be ethically moral. This trend might deviate the research results from the truth; thus, the team bore this in mind

when formulating the questions. Upon this, the research was also an opportunity to get some insights that would help assess which business model fits better the consumers preferences.

Based on that, the focus is on two different *research problems* to be tackled with the qualitative research. Firstly, the research aims to **determine current customer perceptions** and **purchase intentions towards solar energy and solar communities**. Secondly, the goal is to **assess the best possible business model.**

4.2 Qualitative Research

4.2.1 Research Design and Methodology

The research design adopted was exploratory, used to disclose variables that should be included in the quantitative research, increase understanding and collect insights.

A semi-structured outline of questions was formulated (Exhibit 20), and participants were recruited. The new service is to be introduced in Portugal, meaning that it is essential to perform the research with those that will be affected by it and already have substantial knowledge of the Portuguese energy market. Regarding the latter, a consensus was reached that the interviewee must have spent at least 3 years in Portugal to know enough of the market such as brands, campaigns, prices, incentives etc. Therefore, the recruitment was conducted by selecting candidates who are: 1) non-solar energy users; 2) living in a house in Portugal and 3) has lived in Portugal for at least 3 years.

Throughout the in-depth interviews, several different techniques were performed. A laddering technique, meaning a sequential line of questioning from product characteristics to user characteristics, enabled the exploration of consumer attitudes and purchasing motivations towards solar energy. The projective technique, an indirect type of questioning, was used for inferring about underline motives, urges or intentions which cannot be secured through direct questioning and involved subjects such as the lifestyle, music taste or transportation of a solar energy user. A pertinent projective technique, word association, was included to disclose the words that the sample associated with the top 5 energy brands in the country.

The method used to conduct the interviews consisted of one-on-one and online interviews in which the respondents' thoughts were captured. During an average interview time of 45 minutes, the underlying feelings, values, beliefs and attitudes regarding their willingness to join a solar community were identified.

4.2.2 Sample

The sample size comprised 30 participants, including both male and female heads of households in an equitable manner, with 57% being men and 43% being women (Exhibit 21). These percentages were carefully defined with EDP considering that usually in the energy sector, men are the deciders, but women play an important role as influencers. The type of sampling used was judgmental sampling which entails that the population elements were based on the judgment of the research team.

4.2.3 Main Findings

The research showed that most non-solar users, 23 out of 30, considered investing in RSE (Renewable Sources of Energy). Given that, the main **reasons for not adopting solar energy** were found to be monetary reasons (i.e. high upfront investment and long payback period) and a general lack of knowledge. In fact, it can be said that the majority lacks awareness of exact prices and instalment processes. Instead, respondents are merely aware that it involves high costs and a certain amount of additional time and effort. Even though the majority considers adopting solar a big investment, a very positive **attitude towards solar energy** was observed including recurrent comments about Portugal providing the best conditions for solar energy. Surprisingly, only a small minority (4 out of 30) mentioned sustainability and environmental concerns as key driver for a potential implementation of solar energy, whereas the majority indicates a lower investment including savings on electricity bill and incentives such as promotions. Most of the interviewees know someone with RSE, stating that they received an overall positive feedback especially regarding the money saved.

Among existing energy providers with sustainable options, **EDP has the highest brand recognition** (22 out of 30), also being the energy provider for most of the respondents (25 out of 30). Only a minority of 6 people have changed their energy provider before, mainly due to a better deal regarding the price. Those that have EDP are satisfied but are not strong brand advocates – EDP is the default choice. Respondents chose EDP because it was the original provider, meaning that it was the only option available when many had to choose, and it is the one they trust the most. The reasons given for remaining with their utility provider were mentioned as convenience, lack of better options, and the perception that competition is linked with EDP.

When considering **energy consumption patterns**, most energy is consumed at night. The majority felt that their energy consumption increased due to Covid-19, leading to an average electricity bill of €51-100 per month. On top of that, 19 interviewees would not change their habits of consumption if they joined solar as they do not believe it is feasible. Given that, the rest would try to change their habits, for example, by using machines during the day.

While testing for **brand awareness** and **brand perception**, EDP was at top of mind for 22 out of 30 people. The company Endesa was the second brand to be recalled by 11 respondents. Additionally, brand recognition was tested by showing the interviewees different utility brands with its logo and name. Every person recognized EDP, Iberdrola and Endesa. Galp was recognized by 29 people.

The conducted research also aimed at understanding **consumer behaviour** of the respondents. By asking whether they would attend a work-related conference in Zurich in person or via Zoom, an attempt was made to find out whether there was a sustainability awareness which would have led to the decision to use video calling. In fact, no tendency could be observed – 15 people prefer Zoom, 15 people prefer the in-person conference. On the other hand, the interviewees priced a sustainable produced T-shirt about 66% more expensive than a non-

sustainable T-shirt. Here, the consumers may see the extra added value associated with sustainability.

A projective technique was used to reveal the **perception of a typical solar user**. What was found is that some respondents see solar users as people that want to save money, not necessarily due to environmental reasons. The typical person was described to be a wealthy person that lives comfortably and appreciates high purchasing power. The person is conscious and informed, has received a higher education and a stable job. When it comes to tech trends, the person is always up to date. Although having solar panels, a typical solar user owns a premium car.

When asked about the **typical EDP customer**, the sample considers that the person is a traditional Portuguese of 40+ years who is brand loyal and relaxed. However, the opinions diverge when asked non-customers who reckon that a typical EDP customer is not open for change, contributes towards corruption and values family.

Finally, the last part of the research was conducted to **test the concept of solar communities** and the respondents' **openness** to such business. Almost all interviewees (29 out of 30) would be willing to be a producer and share the produced energy with their neighbours. Around half of the people would feel good about being a member of a solar community. Specifically, reasons such as the feeling of belonging, empowerment and pioneering were mentioned. While the majority prefers to be the producer to save more money, others would prefer being the neighbour to not have any responsibilities.

The two main benefits respondents see in sharing the energy in a **community** are reducing the electricity bill and the environmental impact. Additionally, advantages like the concept of forming a community and having an entity like EDP managing it were stated. As more than one-third of the interviewees did not see any disadvantage about the solar community concept, others mentioned possible conflicts related with the distribution of energy or the number of

panels not being enough. Moreover, concerns regarding neighbours leaving the community and having a long-term commitment to a company were raised.

4.2.4 Limitations

Through the qualitative research one was able to gather rich understanding on the research problem, however due to the small number of people interviewed the results have a reduced generalization scope. Besides this, there were other limitations since due to covid-19 restrictions many of the interviews were conducted online which reduces control over the environment and the non-verbal cues that respondents may have. Moreover, interviews were not conducted by professionals which might lead to possible errors. Lastly, focus groups were not conducted because they would have to be operated online as well which undermines the great advantage that characterizes focus groups – controlled environment. Thus, research results lack additional information that could have been gathered.

4.3 Quantitative Research

4.3.1 Research Design and Methodology

In light of the quantitative research, it was followed a descriptive, cross-sectional research design. It involves the collection of data from different groups in a population at a single point in time to examine the relationship between variables of interest. Thus, due to time and social (pandemic) constrains the preferred method to gather data was an **online survey**, where respondents are queried to manifest their opinions and feelings towards *Bairro Solar EDP*, having been distributed mainly through email and social networks.

The survey was built on Qualtrics, an online survey tool that allows users to build a personalised questionnaire and then provides the results in an insightful manner (with graphs and statistical input). The questionnaire is partly composed by multiple choice questions, while others used different scaling methods to pose the questions, such as: comparative and non-comparative scaling. Regarding the first method, it was used rank order (rank from 0 to 7 or 0 to 10) and constant sum (allocate 100 points to the following attributes). Whereas for non-comparative

scaling it was used itemized rating scales specifically 10-point Likert scales (0 is completely disagree, 10 is completely agree).

For the **sampling control**, the same three filter questions were used as in qualitative research, i.e., an eligible respondent would have to (1) be a non-solar energy user; (2) live in a villa in Portugal; and (3) have lived in Portugal for at least 3 years.

In terms of the **content** of the questions, it was largely based on the results of the qualitative research conducted with the aim of validating them. The **goal** of the survey is to understand people's perceptions of what they value in an energy provider and solar energy in general. Subsequently, to test openness to solar communities and to find out what potential concerns would be. Specifically, it was to find out whether MFV would be a barrier.

The full survey can be seen in Exhibit 22. The survey was active for almost 3 weeks from 7th until the 19th of November.

4.3.2 Sample

The filter questions acted as proxies to exclude any non-viable respondents. Hence, out of the 680 respondents only 201 were viable, as the remaining did not comply with the conditions imposed or fail to finish the survey. The sample was gathered randomly and is constituted by 44% of male and 55% female, where the majority (60%) has an age between 46 and 65, which is in line with the intended target. Moreover, the vast majority (62%) is married and the average monthly spending of energy for is between €51 to €100 (Exhibit 23).

4.3.3 Main Findings

In terms of insightful input for **branding** issues, it was found that 75% of the respondents have EDP as energy provider (Exhibit 24), and that the aspects most appreciated in an energy provider vary a lot depending on the respondents' demographics. For instance, what married people value most is brand's reliability, whereas single people and people aged between 55 and 65 welcome the fact that a brand is Portuguese, and finally what 40% of youngsters treasure most is lower prices.

Regarding the **openness to adopt solar energy,** most respondents showed a positive tendency towards that, where 53% are interested in using it at home and around 34% are seriously considering it (Exhibit 25). Connected to this, it was noticed that those that are seriously considering solar options are the older respondents which one can assume have a more stable life (Exhibit 26). Based on this, it was verified that the two main reasons for the interest in joining solar energy were the sustainability factor and the monthly energy savings (Exhibit 27). Following this, one other great motivator was to protect the quality of their children and future generation, most valued (81%) by respondents of age between 36 and 45. On the other hand, the main reason for not using solar energy was the large investment with a late return, which was mainly made by younger people. Other reasons include the fact that the house was not suitable for the installation of panels and that this was not yet the right time in their lives (Exhibit 28).

When considering the **solar communities**, 84% of those questioned would be willing to join (Exhibit 30), mainly because it is a more sustainable option, involves monthly payments and makes it possible to avoid the high prices for solar panels. Those who were reticent about the idea of solar communities had the following main reasons, a preference for more independence, i.e., they would prefer to be the administrator of the community themselves; they would prefer to own the panels and there are several concerns about the complexity of the service and the potential conflicts that could arise.

As to the respondent's preference for the **role within the community**, the results were tight, as 54% would prefer to be a neighbour, while 46% would opt for the role of producer (Exhibit 31). An observation drawn from the analysis is that people that spend more money in monthly electricity bills (above €150) are those that are more willing to join a community (90% - 100% said ‘yes’) and be the producer (Exhibit 32).

Moreover, the respondents that expressed interest in being the **producer** are convinced that the incentives (higher discount on the bill) are worthwhile because they like the idea of assuming more responsibility in the community. Nevertheless, concerns were expressed about how easy it is for neighbours to leave, the long-term contract and uncertainty about what would happen if they moved (Exhibit 33).

By contrast, those who have expressed an interest in being the **neighbour** mention the easiness of leaving the community, as some intend to change house in the future. Besides, they do not aspire to take on more responsibility, and some expressed doubts whether the large number of panels in a single roof would not be aesthetically pleasing. Concerns related to uncertainty when a neighbour leaves the municipality were mentioned, as well as possible technical problems that could arise due to the high complexity.

The last aspect tested in the quantitative survey was the extent to which the **MFV** would undermine the acceptability and adoptability of the 'As-a-Service' business model among respondents. The respondents were asked to state whether they agreed or disagreed (on a scale from 0-10) with the statement "I'm likely to join even with the fixed charge". The average results were 6.4 for respondents who said they would prefer being the producers and 7.2 for the neighbours. The average result for the statement "This is a fair charge" is 5.5 and 6.5 (Exhibit 34). In general, it was found that 75% of respondents would join the community notwithstanding the charge (Exhibit 35), however special attention should be paid to young people with age between 18 and 25 which are the ones that are more concerned about the MFV (45%).

4.3.4 Research Limitations

Data gathered in a quantitative research enables the generalisation of results by measuring them from the sample population. However, even though there is a planned methodology, it is likely that some limitations might arise in the execution phase. One limitation found is that the representation of the target audience might slightly **deviate** from the actual population, because

10% of the respondents fell within the age range of 18 to 25 years old, in which owning a house is uncommon. Furthermore, there is a lack of representation of older segments, above 66 years old, which imposes a limitation on the research market coverage.

Another limitation is the amount of **data collected**. Even though the survey reaches a substantial number of people the number of eligible responses does not grasp half of it. Hence, one can incur that this is originated from the three initial filtering questions, specifically the third one that excludes people that do not live in villas.

Lastly, since the research was performed through an online survey, it is not possible to **control the environment** where the survey is taken, consequently distracting surroundings can affect respondents' attention and perceptions on the service.

5 Business Model Proposal

Considering the main findings on the qualitative and quantitative research conducted, as well as the potential-risk assessment, the proposed business model to implement solar communities is the '**As-a-Service**' model, with the particularity of including a **Minimum Fixed Value**.

As seen in 3.3, this is the model with highest long-term potential to EDP, at a risk the company is willing to bear. By guaranteeing the initial investment for the installation of the communities' solar system, EDP will be able to attract a higher number of customers to this new service. The main purpose in doing so, is establishing a durable relationship with customers that will be translated into long-term revenues and profits to the company. This way, EDP is using its short-term flexibility to assure a stable and profitable long-term future.

The research revealed that the main reason for people not going solar is the high initial cost as well as the long payback. It showed that reducing the electricity bill and the environmental impact are two key benefits people see in this community concept. This solution will allow customers to have solar energy in their homes without the typical upfront investment, saving on their monthly electricity bill and contributing to a greener environment.

EDP can revolutionize the energy sector in Portugal by introducing a new concept that is not only more sustainable, but also more customer centric. People that are not able to install the panels on their roofs, have the opportunity to still consume solar energy stemming from a neighbour's panels, at a discount. EDP is in charge of the maintenance of the solar system and, as community-manager, splits the energy proportionally to consumption among the members.

6 Market Potential

The proposed model for the market potential is constructed based on the concepts of Total Addressable Market (TAM), Service Addressable Market (SAM) and Share of Market (SOM) (Shyam 2020).

TAM refers to the combined unit sales of all the companies in a specific market. For *Bairro Solar EDP*, the market is solar communities and the TAM covers the total number of private households in mainland Portugal (the energy market for the autonomous regions of Madeira and the Azores is not liberalised). This number amounts 5,724,357 houses in 2019 (Pordata 2015). For further calculation, only people living in detached or semi-detached houses, hereafter referred to as villas, will be counted, while condominiums are excluded. This is done because the implementation of the above-mentioned service in a condominium is often too bureaucratic and has different legal implications (law decree 162/2019, article 6.2). Apart from that, there are restrictions associated with the insufficient roof space in Portuguese flats to install enough panels for every tenant. Therefore, this solution is focused on property owners. The percentage of people living in villas is 54.2% (Eurostat 2020). Thus, **TAM totals 3,102,601**, assuming that both the number of people and the percentage of people living in villas will remain constant in 2020.

SAM is a share of the TAM that the service is able to fulfil, in this case the solar communities. Here, a few assumptions have to be made. Firstly, the houses that already have solar panels have to be excluded. EDP currently has around 30,000 customers that have photovoltaic panels installed. It is assumed that EDP's market share for the utility market is the same in the solar

energy market and thus is 74%. The total number of houses that have a photovoltaic system is therefore 40,540 houses. The second assumption is that 15% of the total number of houses will be classified as non-viable due to lack of space and other obstacles. Finally, houses in regions that have less than 40 houses per km^2 are also excluded. This is because in order to form a community, neighbours must be at least 500 meters from the producer. Assuming the producer is at the centre, the minimum area that allows for such a rule is 0.785 km^2 [4]. Given the selected business model, the number of neighbours in a community is five to ten households. Assuming an average of eight households, there is a total of 10.2 houses per km^2. Using a 50% conversion rate plus a fear factor of joining a new service, again 50%, yields a minimum density of 40 homes per km^2, for a total of 1,025,750 homes. Accordingly, the **SAM equals 2,036,311** houses[5].

The last element of the market potential is the **SOM** which refers to what EDP is aiming to achieve in terms of sales in the long run. As per a study conducted by McKinsey on behalf of EDP, the estimated market potential for communities is 6% to 10%, implying a **SOM between 122,178 and 203,631** houses (Exhibit 36).

7 Marketing Strategy

The marketing process of segmentation, targeting and positioning (STP) involves recognizing the differences between customers' behaviours, and make sense of the dynamics of a specific market. **Segmentation** allows companies to better understand a market by grouping customers with similar needs; **targeting** selects which segments to focus on; **positioning** concerns seeking a differential advantage in the mind of the prospect (Ries and Trout 2001) – it is a brand's location via-à-vis its competitors in the mental maps of consumers (Avery and Gupta 2015).

[4] Area around the producer = $\pi * r^2 = \pi * 0.5^2 = 0.785$ km^2.

[5] Computation of SAM = 3,102,601 - 40,540 - 1,025,750 = 2,036,311.

7.1 Segmentation and Targeting

The market for solar solutions B2C is being developed at a rapid pace, but Portuguese energy consumers are still reluctant to adopt solar options. According to the data gathered from the primary and secondary research, the Portuguese population is somewhat homogenous in their opinions, needs, and behaviours regarding electricity – they want a reliable service that allows them to save on the electricity bill. Moreover, concerning solar energy, even if most people are interested, they find the available solutions expensive and unprofitable. On that account, the only variables used to segment this market are demographic[6].

The new brand *Bairro Solar EDP* is going to be introduced in Portugal, where two main living arrangements can be identified – people living in apartments, and people living in villas[7]. The proposed solution will only be applied to villas since, as it was previously explained, apartments and condominiums have complex legal obstacles that prevent the creation of solar communities. Finally, families[8] are the demographic group that displays a greater level of stability in terms of their residential situation, and it also corresponds to the moment in life when people start considering such decisions as adopting renewable energy. With this in mind, the target market selected to pursue was families who live in villas.

7.2 Positioning

From both qualitative and quantitative research conducted, it is clear that the main motivations to adopt solar solutions is to save on the electricity bill and to reduce the environmental impact. These are the primary characteristics of all solar products and services, and so, these are considered points of parity. The prominent reason not to adopt solar solutions, on the other hand, is the high investment associated with the solar system. *Bairro Solar EDP* offers an

[6] Geographic variables could also be applied, but it is implied that Portugal is the scope for this service.

[7] A villa is defined as a single house, a residential accommodation that is not an apartment.

[8] Consider as families a basic social unit constituted by more than one person.

innovative solution that allows people to join solar free from any investment, being this the brand's point of difference. Considering that *Bairro Solar EDP* will be creating a new category – solar communities –, the energy-sharing feature is identified as a point of parity for that category. The same applies to having the utility provider (EDP) as the community manager. Otherwise, in relation to the existing solar solutions and competition, these would be considered points of difference.

To communicate the unique value *Bairro Solar EDP* will offer its target market, and to help guide "the tactical execution of the brand" (Avery and Gupta 2015) a positioning statement was built based on four points: target market, frame of reference, point of difference, and reason to believe. The positioning statement is also covered and explained more in-depth in Correia (2021).

7.2.1 *Bairro Solar EDP* – Positioning Statement

To families that live in a villa looking for new ways to save on the electricity bill (**Target Market**), *Bairro Solar EDP* is the only brand of solar energy solutions (**Frame of Reference**) that offers a revolutionary community-based service that reduces the electricity bill free from any investment (**POD**) powered by EDP Comercial, a leading company with over 40 years of expertise, assuring innovation and commitment to excellence in all energy-related services it provides (**Reason to Believe**).

8 Brand

8.1 Brand identity

Bairro Solar EDP is a brand that is under EDP's umbrella. A brand like EDP carries the knowledge, trustworthiness, and reliability that the introduction of such a disruptive new and complex service needs (Carvalho, 2021). To better relate to the consumer's own identity a brand must adamantly state their beliefs and live by them. That is why, for *Bairro Solar EDP*, it is best to maintain some aspects of EDP's brand identity. To represent and more easily describe

Bairro Solar's identity (Exhibit 37), the brand identity prism, proposed by Kapferer, was used (Kapferer 2012).

8.1.1 *Bairro Solar EDP*'s brand identity

8.1.1.1 Physique

EDP's brand most tangible feature and the one that adds the most value is the use of the colour red - usually used to draw attention, especially when it implies a call-to-action by the consumer. The *Bairro Solar EDP*'s logo – the simplest form of the physique facet – includes EDP's own logo, for the reasons stated before, and it uses a minimalist font and style; the website follows the same design approach.

8.1.1.2 Personality

Were for *Bairro Solar EDP* to be a person it could be described as young, innovative and probably too good to be true. That is mostly due to the fact of the service being so new, therefore very innovative, and maybe too appealing to the consumer as it is a service with no investment needed. That is also why it is important to have the trustworthiness often associated with EDP to be present in this brand.

8.1.1.3 Culture

In culture there will be a greater focus on both the decentralization and sustainability values as these represent the core idea behind *Bairro Solar EDP* – the creation of communities to share renewable sustainable energy. However, these values remain true to EDP's core, meaning these changes are quite miniscule. Plus, being a Portuguese brand will also help on building a sense of community but there will not the main focus of the brand's communication strategy.

8.1.1.4 Relationship

The relationship between consumer and EDP has to be deeper, meaning the communication between the two will be more efficient. Plus, it must stay transparent and clear since the management of the communities will be done by EDP, which means that the absolute number

of interactions between the two is a lot greater, when compared to the usual interactions between utility provider and consumer.

8.1.1.5 Reflection

It is important to mention that the reflected customer is not the target, but the result of what he/she wishes to be seen as a result of using the brand. *Bairro Solar EDP*'s reflected customers are mostly young families, who care about the environment, much like EDP's own reflected customer.

8.1.1.6 Self-image

Self-image symbolizes how the target will feel when using *Bairro Solar EDP*. The consumer feels that, when using the brand, he/she is being more sustainable and is smarter with his/her financials as joining this service allows to save money on a monthly basis. Moreover, and according to the quantitative research, it is an individual that is looking to do more for future generations. **"**I feel that using *Bairro Solar* is a smarter, more cost effective and more environmentally friendly choice".

In comparison to EDP's (Exhibit 38), *Bairro Solar*'s prism does not differ much. In fact, due to its disruptiveness and newness of this service it must keep some similarities for instance in terms of culture and reflection. The few minor aspects where the two diverge is, for instance, on self-image and personality. On the latter, EDP as a person is someone much more reliable, trustworthy, and overall older with much more experience. These minor differences on personality are going to inevitably change the consumers self-image as someone who still makes smart choices, however these are much more wagered and less risky.

8.2 *Bairro Solar EDP*'s brand architecture

It is important to mention that when a brand is released the brand owners must interpret how it might correlate with the others within its portfolio. Brand architecture describes how consumers and managers alike should perceive the links and relationships between brands. The EDP group encompasses the entire supply chain of energy, production, distribution and commercialization.

The focus of this report is of EDP Comercial which is where *Bairro Solar EDP* will be included. There are four types of brand architecture, those are branded house, house of brands, endorsed brands and sub-brands. EDP will act as an endorser for the sub-brand *Bairro Solar EDP*, which means that the sub-brand is classified as an endorsed brand. This is repeated among several of EDP's products and services, like *Energia Solar EDP*, the app *Zero EDP*, etc. Aaker (2004) praises endorsed branding "because they allow brands to be stretched beyond their existing zone of comfort," and "protect[s] brands from being diluted from overstretching".

8.3 *Bairro Solar EDP*'s brand elements

Brand elements will act as identifiers and differentiators for the brand. These elements describe what consumers would think or feel if it were all they knew. The elements created below are designed according to the EDP's brand book (Carvalho, 2021).

8.3.1 Logo

The logo (Exhibit 39) will follow the specific guidelines of EDP's brand book. It was created following the several iterations of the current EDP logo. The minimalist style is in line with what the brand has been doing lately. It also connects with the reflected brand identity seen before as it relates to modern and younger audience.

8.3.2 Slogan

The slogan proposed for this service is "Energia solar para todos" (Solar energy for all). This slogan covers the sense of community by including anyone and everyone plus it also reminds people of renewable energy. It is also future proof as it applicable if the company decides to invest in anything else other than villas.

8.3.3 Character

A character was created specifically for this brand. To better understand this concept, one could recall the advertisement from Ferrero Rocher where the lady asks that she needs something and then is provided with the Ferrero Rocher. The image of the butler and the lady, these two characters, is what is intended to be replicated into *Bairro Solar*'s brand. A character by the

name of Luís will be built and may be characterised as the most average person possible, the only matter that is special about him is that he shares energy. Exhibit 40 shows a mix of hundreds of Portuguese people to show how the common Portuguese looks like. Moreover, Luís is intended to be the identifiable icon of solar communities, thus this character will be replicated into the several media outlets.

8.3.4 Micro website

The website (Exhibit 41) for the brand already exists and will be used to describe what *Bairro Solar EDP* is and to virtually create the communities. As a high involvement purchase and a whole new service, it is important to educate prospective consumers on how the process works.

9 Marketing mix

9.1 Product/Service

Portuguese legislation has evolved to allow a group of people to share, buy and sell energy. For that reason, EDP decided to launch a new service in Portugal that has the potential to revolutionize the access to solar energy, called *Bairro Solar EDP*. A community will be created of both producers and neighbours who will share the solar energy produced by the photovoltaic panels. The **producer** is the one that is responsible and able – due to a number of requirements including size of roof and whether he/she is willing to have them installed – to install the solar panels, therefore he/she will be the one that shares the energy produced. On the other hand, the ones who do not meet the requirements above or might not want to be a producer and be a part of a community will be the **neighbours**. They can join and leave the community at will and take advantage of the solar energy produced. Both producers and neighbours will pay for the solar energy consumed at a discount. However, the producer will benefit from a superior discounted tariff compared to the neighbours due to the added responsibility and provided space. Also, the energy will be proportionately distributed according to each's person average consumption. The number of neighbours and producers accounted for each community will be computed using EDP's algorithm.

Another requirement for the creation of these communities is that both producers and neighbours must be at least 500 meters from each other. Communities will be formed through EDP's website and the process is divided into five phases. The first is the creation of the community, where the producer indicates the space available for the installation of solar panels as well as its consumption habits. The second stage aims to attract neighbours according to the number of panels recommended on phase one. Later, the feasibility of said community is assessed and a proposal is made.

After accepting said proposal, EDP will procced to the installation of the solar system and the neighbours and producers will start to share energy. The selected business model is one where the photovoltaic panels are installed and serviced for free, more on that above. The self-consumed solar energy is sold at a discounted tariff, as described above, and the unused energy will be sold to the grid. Producers are contractually obliged to stay with EDP for at least 15 years. In case they want to leave the community, a removal fee will be charged.

9.2 Process

Process performance and efficiency directly impact the quality of the service, meaning it is a key aspect to achieve a higher customer satisfaction, which leads to loyalty and repeat purchase.

9.2.1 Process Design

9.2.1.1 *Bairro Solar EDP* flowchart

The process starts with a match between producers and neighbours in the *Bairro Solar EDP* online platform, available in EDP's website, with the purpose of forming a solar community. Here the process becomes different for the producer and for the neighbour since the producer needs to perform a more detailed simulation considering the living arrangements' requirements (e.g., available roof space).

After the community is formed, meaning, having the required number of neighbours and producers, EDP initiates a virtual analysis on Google Maps to guarantee the information provided by the prospective customers is accurate and in accordance with the necessary

parameters (e.g., EDP inspects if the roof space indicated by the customer corresponds to the reality). If everything checks out, follows a preliminary visit on-site, where a technical feasibility study is performed. Being the case that everything is validated and suitable for the creation of a solar community, a contract is established with the producers and neighbours. The final stages are the installation of the solar system and consequent community registration. The flowchart can be seen in Exhibit 42.

9.2.1.2 *Bairro Solar EDP* blueprint

The blueprint also exhibits what happens in the service process once the solar system is installed and the community is registered. Once members of a solar community, customers pay the electricity bill to EDP, and in case a member decides to abandon the community, the procedure varies according to the role that member played – i.e., neighbours can leave the community and EDP will try to find new prospects to replace them, but producers would be breaching the contract and a removal fee would be applied to cover the panels' collection.

The blueprint developed for *Bairro Solar EDP* considered the process for the producer, since it is the most complex (the process for the neighbour is the same with fewer steps), and it is displayed in detail on Exhibit 43 and Exhibit 44.

9.3 Place

Marketing channels are formally defined as "sets of interdependent organizations participating in the process of making a product or service available for use or consumption" (Kotler, 2016). For a successful value delivery of *Bairro Solar EDP*, an efficient marketing distribution channel should be designed considering the channel members and structure and fundamentally the end-consumers' preferences.

9.3.1 *Bairro Solar EDP* Distribution Channels Strategy

9.3.1.1 End-consumer Analysis: Segmentation, Targeting and Positioning

Besides delivering what end-consumers' want, companies must also pay attention to how they want to be approached. Consequently, there are six service outputs that cover the major

categories of end-users' demands for different channel systems (Coughlan, et al., 2014), which are: Bulk-breaking, spatial convenience, product variety and assortment, waiting and delivery time, customer service and product/market/usage information sharing (Palmatier, Sivadas, Stern, & El-Ansary, 2019). A brief description of these can be seen in Exhibit 45.

To perform the segmentation for *Bairro Solar EDP*, the same six outputs will be considered. Out of these, the ones that arise concern are **spatial-convenience**, **customer service** and **information provision**, because these are the categories in which the end-consumer's preferences oscillate the most. Regarding the other outputs, for more detailed information look for Exhibit 46. For **spatial-convenience**, *Bairro Solar EDP* would facilitate purchase by being present in EDP's 42 stores and 152 agents, in EDP's micro website, the call-centres would have a specific line dedicated to solving related problems, and finally there would be a D2D sales force available to disseminate information about the service.

The **customer service** varies depending on the channel and the demand of the end-consumer. Logically, physical points of purchase will provide a higher customer service, in comparison with online channels since it is provided by employees with the know-how that can guide potential customers through the simulation. Benefiting from D2D salesforce, and call-centres services would also provide high customer service as these channels provide specialised input.

For **information provision**, it will be much needed since *Bairro Solar EDP* is a completely new service and potential customers will need more convincing. Besides the information provided by the different marketing channels, end-consumers will also be exposed to related advertising and social media content. Based on this, one should identify the level of each output is desired by the end-consumer, where those that have similar preferences on how to they want to be approached will be defined as a segment. To understand how many segments exist and how they are defined, we asked 30 people what their preferences regarding these **three outputs** were (Exhibit 47). To understand the reasoning behind the survey, see in Cosme (2021). For

spatial convenience it was tested the preference between in-store service or remote options; Customer service was regarding to what extend would they want the company to get involved in their journey; and lastly information relates to how much information and education on the service is needed to make a purchase.

With the results, a cluster analysis was performed where 3 segments were drawn (see bubble chart of Exhibit 48). These segments are characterized by: **Segment A (20%):** low willingness to go to store (remote), moderate high customer service and low information; **Segment B (40%):** moderate high willingness to go to store, high customer service and information; **Segment C (40%):** moderate high willingness to go to store, low customer service and moderate low information. In addition, it is important to state that all these segments require the **lowest waiting time** possible and the needed for **high customer satisfaction.** A scheme with this explanation plus the segments' characterization is present in Exhibit 49.

9.3.1.2 Channel Design

9.3.1.2.1 Channel Members

After defining the target segments through the end-consumer analysis, and considering EDP current distribution channel strategy, it is important to identify the channel members that contribute to a successful value delivery. The upstream processes of the supply chain are the responsibility of the **suppliers** that produce mainly the solar panels and inverters. Suppliers will then sell to **EDP** which is the "channel captain" as it is the member who triggered all courses of action to implement *Bairro Solar EDP*.

EDP owns one single **warehouse** where it stores all the equipment produced by the suppliers, however part of these will then be transferred to other warehouses distributed across the country that belong to the companies subcontracted by EDP – the **distributors**. Besides distribution, these are also responsible for the installation, and maintenance process. The advantages of these subcontracted companies are explained in Cosme (2021). After that, EDP coordinates a set of **marketing channels** which are: **online-channels** – **micro website** where users can seek

information and do the simulation; there is also a section of **EDP Zero App** to bring awareness of *Bairro Solar EDP* to already EDP consumers. Still as an online channel, EDP would create a **chatbot within the website** for fast-answer questions and use **email marketing** either to promote the new service or provide information.

As for **traditional channels**, there are the **EDP stores and agents** that would incorporate *Bairro Solar EDP* new service into their services. Here consumers would obtain a more detailed information and possibly to the simulation with the assistance of a knowledgeable employee. The **Door-to-door** channel integrates a sales force mostly responsible to attract and sell to new clients. Lastly, EDP would use **call-centres** specific line to perform telemarketing and provide support.

9.3.1.2.2 Type of channel per segment

Based on the cluster analysis performed, to reach the most attractive end-consumer segments, the most suitable channel for each was identified: segment A is the **Website** and **Call-centre**, for segment B is the **D2D salesforce** and lastly for segment C is the **Website**, **Chatbots** and **Email**. For segment A call-centres are the ideal channel to provide specialized input and validate customer purchase decision. Segment B demands high quality service without wanting to go to stores hence D2D salesforce is the next best alternative and lastly segment C is quite autonomous and wants to obtain information with less invasive channels such as email and chatbots. For a more descriptive explanation look for Exhibit 50. Physical stores and agents were not addressed as the better suited channel for any of the segments, because none of each showed high in the willingness to go to store. Meaning even though these channels will still be available to use, end-consumers present a tendency to remote options that are more convenient and take less time.

9.3.1.2.3 Channel Structure

The channel structure of *Bairro Solar EDP* will embody a very similar structure to Energia Solar EDP's current one (Exhibit 51) (provides the most comparable service), as the supply

chain members and the frequent contact will remain the same. For a better understanding of the distribution structure, one should follow the reading of this section with Exhibit 52. For the first action EDP would request and pay to the same suppliers a certain amount of the tangible items (1) according to the forecasted demand, which would then be delivered from the suppliers to EDP (2). After that, for the storage of these EDP would continue to use its own warehouse as well as the warehouses of the subcontracted companies. There is no need to acquire more warehouses because EDP performs B2B services that also require the storage of high number of panels, meaning *Bairro Solar EDP* would not incur an increase of inventory per warehouse. Once the end-consumer engages with the services *Bairro Solar EDP* from one of the marketing channels and converts, then the service will be directly delivered from EDP to end-consumers (3). From that moment on the consumer must pay his regular monthly energy bill whereas the part coming from the renewable source will have a discount. The contact between the marketing channels will be constant during the whole process and will continue post-purchase as service support.

It is also important to highlight reverse logistics that could come from the end-consumer upwards, this could happen when there is a malfunction with the tangible items of the service which would activate the insurance or when consumers no longer want the service. Regarding the latter, in *Bairro Solar EDP* specifically this would happen when a producer decided to cease the contract under extreme legal conditions. In this case the panels and its equipment would be picked up by the distributors and stored back to the warehouses (4), which can later be re-installed if one is within its lifetime period (25 years).

9.3.1.2.4 Channel Flows

All the members of the marketing channel mentioned above perform several functions with respective flows, some of them flow forward from upstream players down to the end-consumer; others flow backwards from the end-consumer up and still that are others that flow in both

directions – bidirectional flow (Cosme, 2021). Thus, for a better understanding of these functions follow through with Exhibit 53.

Physical possession of the tangible items passes through all the members: Suppliers produce the items, EDP stores them and End-consumer will have them installed.

In terms of **ownership**, once EDP receives the tangible items it becomes the owner of them through the rest of the process, whereas the end-consumer, specifically the producer, will just lend roof space.

Regarding **promotion** flow, it will only be dealt from EDP to the End-Consumer through the marketing channels in which the promotion will be the advertising campaign that imply the usage of a set of media channels.

Negotiation and financing flows both ways between the suppliers and EDP. Being a large company, EDP has gained a substantial bargaining power hence each year EDP performs a market consultation announcing how many panels it will need to buy, then several proposals are submitted, and the cheapest ones will be chosen to be the suppliers.

Regarding **risk**, it flows both ways between all the players. Risk encompasses suppliers because there could be disruption of internal operations, whereas for EDP the risk can be related to disturbances on the flow of the product, suppliers' financial stability or unpredictable end-consumer demand, moreover environmental risks influence both (Bsaikrishna, 2016). Also, some of the risk is shared between EDP and the end-consumer with the application of the MFV and the removal fee when a producer quits.

About **Ordering and Payment,** it also involves the three players but in an upward flow. Frequent ordering is done between Suppliers and EDP, in which EDP has a timespan of 60 days to fulfil the payment. When it comes to an end-consumer, each community will make a personalised order of how many tangible items are needed once the producer signs a contract and will then pay for the service through its monthly electricity bill over the years.

Lastly, **information sharing** is a bidirectional flow that occurs across the whole process between all members. Supply chain management entails a great deal of information, either direct contact like the one between suppliers and EDP, processing information such as billing, inventory levels, delivery status etc or through the usage of marketing channels to reach the end-consumers, making this flow crucial for an effective supply chain.

9.3.1.3 GAP Analysis

The channel that meets service output demands at a minimum cost of performing the necessary channel flows is called **zero-based channel** (Coughlan et al, 2006). For *Bairro Solar EDP* to reach this desired goal, one should firstly study the limitations that constrain the channel design, the **environmental and managerial bounds**; and secondly analyse possible gaps (**service and cost gaps**) and define how to close them (Cosme, 2021).

9.3.1.3.1 Environment and Managerial Bounds

Regarding *Bairro Solar EDP* **two** environmental bounds were identified. Firstly, the **market coverage scope** is **limited** to Portugal Continental because the energy market is not liberalized yet in the islands (Madeira and Azores), hence the distribution, legal policies and competitive landscape are completely different. Secondly, cost might increase because not everyone is **tech-savvy** and thus, they might resort to more expensive channels (In-store, D2D, etc).

Concerning **managerial bounds,** the implementation of *Bairro Solar EDP* might prompt an internal conflict, as some channel members might profit more with the Energia Solar EDP option than *Bairro Solar EDP*. Additionally, EDP as a company decided to **share** some **risk** with the end-consumers by adding the MFV that can reduce customer satisfaction.

Lastly, an **information provision** gap may occur if employees and collaborators lack knowledge on the new service due to small investment in training. Since *Bairro Solar EDP* is a novelty, it might be perceived as complex to the end-consumer, which can induce a more demanding education on the service.

9.3.1.3.2 Potential Gap Sources

9.3.1.3.2.1 Service and Cost Gaps

In the light of *Bairro Solar EDP*, some service gaps identified were in cases where there is **more supply for what is demanded**. None of the segments showed high willingness to go to store (spatial convenience) as people are increasingly preferring convenient channel options. Hence, the high number of open stores and agents might be excessive for the number of potential customers who will seek stores for this service. Additionally, not all segments request for high customer service either, such as segment C, indicating end-consumer quite often prefers the "do-it yourself" approach where in-store, D2D or even call-centres can provide excessive **customer service**. The same happens for the **information provision**, in which some segments (A and C) do not need high levels of information to pursuit a purchase.

By contrast, service gap identified where there is **less supply for the service output demanded**, is related to the **waiting and delivery time** of the service. One can assume that consumers want the service to be delivered as fast as possible, but since this is a new service it is hard to quantity how long it will take from the simulation to the implementation of the service (installation of the solar panels). Thus, if this process takes more time than what the consumers expects, this service output will not serve properly the consumer's needs. Moreover, the same can happen in the waiting time to obtain in-store service or a call from the call-centres, as long queues or overcrowded phone-lines will increase waiting time.

Concerning **cost gaps**, to provide high quality customer service and high levels of information provision, it is necessary a large investment in employee training. However, linked with some segments' lack of demand for information provision, costs could be associated with **excessive training** on the new service, this could be particularly true for stores and agents, since there is small tendency to the in-store experience and 50% of sales comes from D2D. Plus, special attention should be paid to **employee turnover** that can lead too wasteful money spent in training. Additionally, related to service add-ons there are two managerial decisions that will

increase costs. **Free maintenance** is included in the service however since there is a higher number of panels (in one house) compared to Energia Solar EDP services, maintenance costs will increase. In this case there is no service gap as it creates value to the customer but there is a good chance that at least some channel members are not receiving the level of profit that adequately compensates them (Coughlan, et al., 2014) creating a cost gap. Lastly, communities in *Bairro Solar EDP* have the risk of a neighbour quitting the service, towards this EDP would try to find a substitute and if this were not possible then the extra panel(s) would **be removed**. This action would require high transportation costs that undermines the efforts to remove the panel(s).

9.3.1.3.3 Closing Channel Gaps: Combined Channel Gap

As it was stated above, both service and cost gaps might potentially coexist in the *Bairro Solar EDP* service. Since the channels do not exist yet, one should gain control over potential gaps that might arise. To fix **service gaps**, there is a need to specify which service gap occur for each service output, segment and channel (Exhibit 54). Possible **solutions** for these gaps can be: for spatial convenience EDP should pay attention if in fact the hypothesis that segments do not want to go to the store verifies, if yes maybe **not all stores need to be specialized** in *Bairro Solar EDP*. For the possibility of excessive provision of customer service and information for some segments the solution would be to invest in **the right channels for each segment** providing their desired amount of service output. For instance, if segment A does not need high information provision perhaps just a call to offer support is preferable than sending a highly informative email. Related to high waiting time for the process duration (simulation until installation), one can be overcome by either setting more **realistic expectations** of service delivery duration in consumers' minds or analyse with partners **possible pain points** of service delivery. For the waiting time in-store and call-centres, it is more likely to occur in the call-centres since consumers are not prone to go to stores, hence the solution would be to allocate **more staff** from the call-centres to Bairro Solar EDP. At this moment, seek Exhibit 55 to link

cost gaps with supply members and type of bounds. All possible cost gaps arise from managerial bounds, and conceivable **solutions** could be: related to training costs focus most training efforts on the biggest source of sales, the D2D and invest in training 1 or 2 employees per store on the new service, and regarding employee turnover a solution would be to not train new employees. Finally, related to service backup the maintenance is a cost that is necessary to respond to customer's demand, however the one regarding the panel removal due to a neighbour quitting, a solution would be to see if the community members are indifferent towards it, if they do not mind the extra panel then EDP need not to incur transportation costs for the removal.

9.4 Physical Evidence

9.4.1 Tangible Elements and Service Environments

Regarding *Bairro Solar EDP* there are two main tangible elements that constitute the service core offering: solar panels (Exhibit 56) and inverters (Exhibit 57).

As for *Bairro Solar EDP* service components, these ought to be designed in order to proportionate a pleasant customer experience. More information on how to design service environments in Cosme (2021).Hence, EDP stores and agents should have a similar physical place with a professional but comfortable ambience, where there should be fast customer service to avoid crowding. Tactics to reduce the negative connotation of queues can be to add suiting music, attractive and informative pictures (to stimulate the customer) and also coffee machines. Additionally, the website is one of the most important channels hence it should be in tone with brand's identity, intuitive and run smoothly specially the simulation in which if something lacks might be enough to discourage the purchase. Moreover, call-centers should have an appealing music to reduce the negative association of waiting in the phone line. Lastly, D2D sales force should not only have equal uniform in line with EDP brand's identity, but also have a similar training and approach so the service does not vary substantially, enabling a coherent quality service. Plus, this sales force should try to find the optimal time to visit potential clients, possibly schedule it, so that they do not catch someone in a bad time which

will subconsciously undermine the service value delivery. See all this explained in the Mehrabian–Russell Stimulus–Response Model in Exhibit 58.

9.5 Price

At the time of writing, there is not a Solar Community offer by utilities in the Portuguese market yet. Therefore, EDP will be a price setter in Portugal and for this reason it is important to adroitly state pricing objectives.

9.5.1 Pricing objectives

Considering that this solution aims to democratize solar energy in the way that it wants to allow everyone to benefit from it, as stated by the EDP team, the main pricing objectives are market-share leadership in the collective self-consumption category in Portugal; long-term profit maximisation. Knowing that solar communities will lower customer acquisition costs, the company aims to have 15,000 solar communities by 2025 (Pereira 2020).

Value-based pricing is the method adopted in this analysis and involves the client in the decision, one of the concerns raised by the EDP team. Unlike cost-based pricing, this approach bases the price of the service on its customers' perception of value. The variables that might change the price of this service are related to role of producer or neighbour; minimum fixed value; number of neighbours and panels.

We propose using **penetration pricing** to introduce this service in the Portuguese market. By setting a price low enough to attract and conquer a large base of community members, the utility can increase penetration and its market share quickly. Moreover, the value proposition, positioning statement and the significant price sensitiveness among Portuguese consumers towards the energy sector sustain this pricing strategy.

9.5.2 True Economic Value

Assuming that, under the law decree 162/2019 (article 6.5), the current next best alternative is forming a community without EDP, a different True Economic Value (TEV) was computed

depending on the role because the level of savings varies for producers and neighbours[9]. Considering that 12 panels are needed for a community with 4 members and considering the cost of €759[10] in the Portuguese market for a photovoltaic solar panel, the neighbourhood would need not only to invest €10,948 (€2,737 each), but also to ensure installation and maintenance – if it chooses to create a community independently from the utility (Exhibit 59). The added value represents how much EDP is adding from what the competition is offering (also known as the value of performance differentiation) and, in this case, it englobes the expected savings in terms of the required investment to join a community and the extra savings that customers get from joining EDP's Solar Communities. To illustrate, someone that joins EDP's Solar Community as a producer would save around €3,044.91 along the lifetime of a 15-year period, assuming a common percentage of self-consumption of around 75%. Thus, the TEV of the new EDP service for producers is €7,165.61and €6,310.38 for neighbours (Exhibit 60).

9.5.3 Perceived Value

The concept of Perceived Value describes a customer's understanding and impression of an offer. Customers evaluate the service and its ability to match their expectations and needs. The in-depth interviews indicate positive value perception patterns. The top reasons which explain why our sample values this solution comprises the possibility to use PV solar panels with no cash upfront and no maintenance costs, sustainability consciousness and the provision of energy savings into the future. Based on our quantitative research, 84% of respondents valued this solution.

[9] Solar Discount Tariff applied to the self-consumption of the producers is 0.06 (€/kWh) and the solar discount tariff applied to neighbours is 0.04 (€/kWh).

[10] https://www.leroymerlin.pt/Produtos/Eletricidade-e-domotica/Energias-renovaveis/WPR_REF_81908458

9.5.4 Cost of Goods Sold

To become profitable, a firm must set a price that is above its COGS (Cost Of Goods Sold) which are the costs required to provide a certain service. This cost of acquiring the products that are directly tied to the execution of the service comprises the cost of acquiring PV solar panels (€0.25/Watt peak [Wp]), inverters (€2,000) - which converts direct current (DC) to alternating current (AC) electricity -, cost of installation (€1,700), necessary structure (€1,500), costs associated with the system used to locate, track and monitor the entire system (€300). The unit margin describes the difference between the per-unit revenue received by a firm and the per-unit variable cost of production (Dolan and Gourville 2014). The supplier receives an approximately 44% margin, according to data provided by the company (Exhibit 61) and the estimated margin for the supplier is 36% (€24.5) per solar panel. Net profit margin is a ratio that measures total earnings as a percentage of its revenue and is computed as the business's net income divided by revenue. Exhibit 62 shows the evolution of net profit margin of this service throughout the years. On average, EDP could achieve a profit margin of 30%.

9.5.5 Management of Price Sensitivity

The measure of the impact of price points on customer purchasing behaviours is named as price sensitivity. By way of explanation, this concept analyses if there would be a percentage of sales that a company would gain or lose at a specific price point compared to another. A service's price sensitivity is useful to uncover, for instance, the impact of pricing changes on sales and adoption of the service. According to our sample results, it's possible to infer that the minimum fixed value is not a concern for 75% of our sample. This means that this charge is largely considered as "fair" and that they are still willing to join a Solar Community with this charge. Particularly, respondents who prefer being the neighbours are more tolerant than producers. In short, it is possible to assume that our sample is "insensitive" to the minimum fixed value, showing signs of little sales impact of this fee.

9.5.6 Price Segmentation

Price segmentation requires charging different prices for a service to different customers (Samuelson and Nordhaus 2010). Indeed, customers were segmented into two groups: producers and neighbours, each one being charged a different price. Producers, who provide the space to install the panels have a solar discount tariff of €0.06/kWh on the solar self-consumed energy whereas the neighbours are offered €0.04/kWh.

9.5.7 Pricing Tactics

Given its strategic importance, it is imperative to implement pricing tactics. By the use of "**pure bundling**", the singular components that make up the bundle can only be sold as a whole package and not separately (Stremersch and Tellis 2002). Essentially, this customer's only option will not allow them to purchase the panels, the installation, maintenance or community management separately. It is essential to make it easy for early adopters to try the holistic experience and benefits. On the other hand, **"cross couponing"** consists on providing discount coupons to be used on another product from the same company. In this case, EDP could offer a coupon to incentivize them to acquire a related product, namely *Wallbox Casa EDP*.

9.6 Communications Plan

A communications plan was created to ensure the right message will be delivered to *Bairro Solar EDP's* audience right after the launch. The planning involves setting objectives, defining target groups, establishing communication objectives, message and creative strategy, tactics and campaign evaluation.

9.6.1 Marketing Objectives

Since *Bairro Solar EDP* will enter the new market of Solar Communities, the marketing objective for this campaign is to reach a market penetration of 1.9% after year one, rising to 14% after year five (Exhibit 63). A first mover advantage will help EDP to successfully enter the new market with its new brand and build barriers to entry (Przychodzen, Leyva-de la Hiz & Przychodzen 2020). The overall goal will be to raise awareness and to successfully position

Bairro Solar EDP in the market (further explained in this report). In order to reach this goal and to benefit from its first mover advantage, the budget for the marketing campaign amounts to €900,000 in the first year and will increase to a total of €2.2M by the end of the fifth year. This budget is planned based on the predicted market growth in terms of growth in supply and demand (Augustine & McGavisk 2016).

9.6.2 Target Audience Selection

The target audience selection includes identifying **relevant target buyer groups** and their **demographics**, **lifestyle** and **psychographics** (Percy, 2018).

The **primary target audience** for the campaign will be **New Category Users** (NCU's), non-users of solar energy, entering the category of Solar Communities for the first time, thus not having any degree of brand loyalty yet. To be more precise, these will be **positive NCU's** that are conscious about Solar Communities, are open to it, but have not yet made a trial purchase and **unaware NCU's** that never heard of Solar Communities before (Rossiter, Percy & Bergkvist 2018). The reason for this lies in the fact that *Bairro Solar EDP* is a new brand in a new category that most future customers have never heard of before.

The target audience is **aged between 35-65 years**, as in this age range they are likely to be in a stable living situation, meet the requirements of a household (own a villa, built a family) and are open to join a community (Exhibit 64). Moreover, potential customers will need to be capable of signing a contract and paying the monthly bills. It is therefore essential to include **financial stability** in the selection process. In terms of **psychographic** characteristics, as found in qualitative research (see chapter 4.2.3), potential customers live comfortably and are informed, conscious and up to date when it comes to technical trends. Yet, they desire to save money and tend to have a long decision-making process.

The latter is also the reason for the **secondary target audience: Opinion leader and prospect customers** of Generation Z, people born between 1996-2010. Their strong environmental awareness may influence their families (Gomez, Mawhinney & Betts n.d.). Although they are

not yet a purchasing target due to their age and life situation, they have a strong impact (Iyengar et al. 2011) and will become potential customers in the medium term.

9.6.3 Target Audience Action Objectives and Behaviour

The Pre-purchase action for *Bairro Solar EDP* includes a visit to the **retail shop or website**. The idea is to allow interested people to obtain more information about the service or to perform a simulation for their home. The Purchase action is considered as **purchase,** which means signing the contract. Lastly, the Post-purchase action consists of customers **recommending** the service by sharing their experiences with their peers both online and offline, and encouraging them to spread the word. The goal for this campaign is to acquire 3,881 households resulting in 715 communities by the end of the first year. This initially limited number of customers will be explained by the long purchase obligation of a utility company (Schleich, Faure & Gassmann 2019). Due to the increasing popularity and openness to the still new service resulting from this campaign, it is expected that this number will rise to a total of 28,428 households and 5,238 communities in year 5.

Exhibit 65 illustrates the **Behavioural Sequence Model**. It facilitates a general understanding of the customer's purchase decision process by summarising the individual decision-making phases of the target audience and the key players within these phases. The insight gained from this is an essential step in positively influencing and possibly guiding the consumer’s decision (Rossiter, Percy & Bergkvist 2018).

9.6.4 Communication Objectives

For this campaign, the communication objectives are derived by considering the options within five communication effects: Category Need, Brand Awareness, Brand Attitude, Brand Purchase Intention, and Purchase Facilitation (Rossiter & Percy 1997).

Since the focus of this communication plan will be on NCU’s, it requires to include **Category Need** in the marketing campaign (Percy 2018). Most likely, the target audience will not be aware of the benefits and potential advantages of joining a solar community. As such, ensuring

that they understand the value that solar communities and *Bairro Solar EDP* offer will be a key consideration. Category Need must be *sold* in an easy and understandable manner. This is also the reason for a relatively high advertising expenditure, which will be discussed later in this report.

As for **Brand Awareness**, the focus of this communications plan lies on *Brand Recall*, so that consumers will remember the brand once Category Need is recognised, prior to the purchase. This will be further stimulated by the inclusion of the name EDP, which is already attracting considerable attention (Exhibit 20).

Bairro Solar EDP will be introduced to a new category and NCU's are unaware and have no previous **Brand Attitude**. Therefore, it is crucial to *create* both a positive Brand and a positive Category Attitude by positioning it against the belief that solar energy requires high levels of investment and commitment.

As this new service is considered to be a High-Involvement Purchase, **Brand Purchase Intention** needs to be *generated* with the campaign's goal of encouraging the customer to form a conscious intention to act, by implementing a Call to action (Schottkowski 2021).

Lastly, **Brand Purchase Facilitation** has to be *incorporated* in the campaign. Given the new service, consumers may not have sufficient information of how and where to purchase it. Hence advertising and promotion must be adapted and refer to the website or a store for further information. An overview of the communication objectives is provided in Exhibit 66.

9.6.5 Positioning Statement for Communications Plan

A positioning statement will be created to position the brand in the consumers mind and to serve as a brief to generate the communications campaign (Rossiter & Percy 1997). Although *Bairro Solar EDP* may benefit from EDP's positioning and expertise in the Portuguese Energy Market, it will be essential to focus on the **functional key benefit** and strongest purchase motivation of the new service (Rossiter, Percy & Bergkvist 2018), namely the monthly savings without

upfront investment. This key benefit is **Important**, **Deliverable** and **Unique** (Rossiter, Percy & Bergkvist, 2018) which needs to be emphasized in all further marketing communications.

The positioning statement is as follows: **To** families in the age of 35-65, living in villas seeking for alternate ways to reduce their electricity bill (NCU's), ***Bairro Solar EDP*** is the centrally positioned brand of Solar Communities (Service-as-hero) **that offers** monthly savings without upfront investment (Incomplete Satisfaction) while at the same time providing a sense of belonging to a community that is contributing to a sustainable environment (Social Approval) **because** EDP, with 40 years of experience, is the leading energy supplier in Portugal and the first company to offer a shared solar energy solution for private households. The **advertising** for this brand should emphasize that it solves a problem by enabling customers to save money through easy access to solar energy while at the same time being part of a community ($e^- \rightarrow b \rightarrow e^+$ focus in the a-b-e model), **must mention** the effortless instalment process and transparency about energy and cost savings (Entry-ticket benefit) and will **omit** price and technical aspects or requirements of the service (Inferior benefit).

9.6.6 Creative Strategy

The Creative Strategy comprises four components: (1) key benefit claim, (2) creative idea, (3) brand awareness and brand attitude grid tactics, and (4) attention tactics (Rossiter, Percy & Bergkvist 2018). Given the scope of this thesis, the latter will not be covered here.

For *Bairro Solar EDP*, the **key benefit claim** is that consumers will become part of a community and are able to access solar energy effortlessly while saving money.

The **creative idea** is an attention-getting method of expressing the brand's position in an appropriate format. For *Bairro Solar EDP* it is important to make the new service understandable and accessible for everyone. This will be achieved through everyday situations that the whole target audience may identify with and create emotions that they may relate to.

More importantly, the aspect of community and solidarity will be brought to the fore, so that people feel a sense of belonging and unity.

The Rossiter & Percy grid is a typical model to decide on the **brand awareness and brand attitude tactics** (Rossiter, Percy & Bergkvist 2018). As explained in 9.6.4, consumers need to remember the category and brand of *Bairro Solar EDP* when need arises (Brand Awareness: Brand Recall). The purchase of this service represents a high-involvement purchase. Thus, search and conviction are required in advance, which arises from a negatively originated motivation, namely the need for monthly savings on the electricity bill (Brand Attitude: High-Involvement/Informational). **Brand Recall tactics** for the ads should therefore be a repeated, explicit mention of category need followed by the brand name in the main copy line; the use of a mnemonic device in form of a catchy slogan for broadcast ads to rehearse category need; and a high advertising frequency since repetition will increase brand name recall. **High-Involvement/Informational tactics** consist of the correct emotional portrayal of the motivation as this is a very important function in an early product life and consumers have to be "sold" on category and brand need when the product is completely new. The ad introduction should be reassuring, not extreme or confrontational, since prospect customers will most likely have a neutral prior attitude towards the brand (Rossiter, Percy & Bergkvist 2018).

Exhibit 67 includes the **Creative Brief**, summarising the research and strategic decisions previously performed for *Bairro Solar EDP's* communication plan.

9.6.7 Integrated Communications Strategy

Integrated Marketing Communication is the combined use of suitable types of **advertising** and **promotion** that are aligned with a brand's communication objectives. In this context, it is of utmost importance for *Bairro Solar EDP* that communication is coherent across all channels to convey both advertising and promotional messages (Rossiter & Bellman 2005).

Advertising will be used to successfully place the new service *Bairro Solar EDP* in mass media in order to turn the individual's mind toward the consideration of the brand. As already

mentioned, the main focus will be to present the most important benefits: the possibility to save money with solar energy and to be part of a community at the same time.

As a **Promotion**, a 3-month competition will be initiated after the launch of the service. All households that virtually register to form a solar community within this period will have a chance to win an electric car. People interact with the brand, get information and see this as an incentive to participate in the competition. The goal here is to encourage as many people as possible to run a simulation and to sign up.

This competition also results in the **Public Relations** (PR) strategy. The first *Bairro Solar EDP* community created will be inaugurated with an event in the community, attended by the *Head of the Bairro Solar EDP*. Speeches and interviews will be given to reinforce the importance of solidarity within the community and to promote the simplicity of saving with solar energy. This action is an effective way to raise awareness and engage with the press in order to arouse public attention and to gain trust and reputation. It is not only the first community that is honoured and celebrated as a pioneer. More than that, this action is an effective way to raise awareness and engage with the press. Public attention is raised, and broad media coverage may be expected. As a result, trust and reputation is gained among future customers.

9.6.8 Media Strategy

To engage the target audience in the most effective way, the campaign for *Bairro Solar EDP* will be a multi-channel campaign. Great emphasis will have to be placed on implementing the creative strategies to communicate a consistent and clear message across all channels. As previously mentioned, the campaign for *Bairro Solar EDP* aims at generating Brand Recall and a High-Involvement/Informational brand preference. The most suitable **primary media** will therefore be **TV**, **Internet** and **Outdoor Ads** since they generate both. The average length of the **TV** ad will be 30 seconds (Rossiter & Bellman 2005), displayed during prime-time on main channels so that it most effectively reaches the target audience in their most trusted medium (Correia & Martins n.d.) (Exhibit 68). Regarding the use of **Internet**, the website will be

enhanced as it serves as the only owned direct touchpoint and will be used as a channel for more detailed information (Exhibit 41). In addition, **Web-banner ads** on search engines (e.g., Google) will be implemented to trigger direct customer and direct them to the website. To establish direct contact with Gen Z, an **Instagram** page will be launched (GlobalWebIndex 2019), while a **Facebook** page, with its rather older users, will serve as a touchpoint for the primary target group. These platforms provide opportunities for constant interaction and creates an image of credibility and willingness to listen to what customers have to say. Additional **Social Media Ads** (including Facebook, Youtube, Instagram) enable effective targeting to increase the likelihood of also addressing the previously undecided and attracting awareness (Exhibit 69). Lastly, **Outdoor Ads**, in form of billboards and mupis, allow reaching a large audience with the benefit of a long lifetime of a message. Although most people pass them at high speed, the exposure time is short, limiting the messages to a few words or illustrations. Yet they will often be exposed to the same advertising several times as they travel the same routes, resulting in high levels of frequency (Exhibit 70). The **secondary media** will be **Newspaper**. This is for educating potential customers about the concept of solar communities and the benefits of *Bairro Solar EDP* as well as providing them with more detailed information (Exhibit 71). For *Bairro Solar EDP's* new-product campaign, **high frequency** of exposure is initially required so that it has an impact on people's action (Schottkowski 2021). As such, it is necessary to repeat the association between category need (Solar Communities) and brand *(Bairro Solar EDP)* in order to make the message memorable and raise Brand Recall.

9.6.9 Campaign Budget and Schedule

The total campaign budget amounts **€900,000** for the first year, including a total ad spend of €765,000 (including a media buying agency commission of 5%) and production costs of €135,000 (Exhibit 72). The budget is allocated based on media cost and target audience reach considerations. The campaign will be implemented after the launch of *Bairro Solar EDP* in February 2021 and will continue the following years so that the budget increases to a total of

€2.2M by year 5 (see Exhibit 74 for development of marketing budget). Chapter 9.7 provides an outlook of possible marketing strategies for the future. The schedule considers the previously defined **high exposure frequency** as well as the implementation of the various media objectives (Exhibit 73) (Schottkowski 2021). As this is a proposal, the final prices and schedules will have to be adjusted on the basis of EDP's advertising rates and the evolving competitive landscape.

9.6.10 Campaign Tracking

In order to raise awareness and increase brand recall, high frequency of ad exposure will be needed. It will be measured by Gross Rating Points to determine how many people have potentially been exposed to the ad. However, sales and Return on Investment (i.e. new contracts signed due to campaign) will be the main Key Performance Indicator (KPI). Digital KPI's will be covered by Conversion Rate (Web Banner/Social Media Ads to simulation), Website visits and Click-through-rate. While it is difficult to measure PR, it should still be monitored both online and offline on a weekly basis to understand and remain informed about brand awareness and the buzz generated.

9.7 Outlook: Customer Relationship Suggestions

With *Bairro Solar EDP*, EDP will be a pioneer in the solar energy market, incurring a competitive first-mover advantage. However, being first is no guarantee of unlimited success, as it is important to keep customers engaged and interested in the service so that the offer remains relevant. To build on the Communications Plan described above, the following recommendations are made for the upcoming years, serving as an outlook for possible strategies.

The recommendation is to build on **Customer Relationship Management** (CRM). Due to the increase in customer power, the concept has been redefined to reflect a more social position. Social CRM is a philosophy and a business strategy, supported by a technology platform, business rules, processes, and social characteristics, designed to engage the customer in a

collaborative conversation in order to provide **mutually beneficial value** in a trusted and transparent business environment. It is the company's response to the customer's ownership of the conversation (Greenberg, 2010). There are a few tactics that will allow EDP to have an interesting conversation with community members.

First, one will benefit from the EDP Zero App as a platform for a **gamification strategy**, bringing the dynamics of a game (point system, rewards, etc.) into a non-game environment. Generally, human beings thrive in competitive and goal-based surroundings, thus it is used to boost customer engagement and grow businesses. In fact, *"the global gamification market size stood at USD 6.33 billion in 2019 and is projected to reach USD 37.00 billion by 2027 (…)"* (Fortune Business Insights 2020). With that, EDP could create a point system where each community would compete through time-limited challenges, meaning each community member contributes to the overall scoring of the respective community. Only the community that performs better in a given challenge would be rewarded (could be a collective reward or individual).

Additionally, since EDP is doing efforts to be more socially responsible, challenges could be socially focused through **partnerships**. For instance, the community that plants more trees or donates more to an assigned organisation earns points. Some challenges will be regionally based and all the communities within that area are rewarded. Thus, a challenge could be a partnership with Pingo Doce and Banco Alimentar, where each region would have an assigned Pingo Doce where the communities could contribute to Banco Alimentar. Whoever contributes the most will be rewarded. All of this will then be tracked through *Bairro Solar EDP* section on the App, increasing traffic to an owned channel and engagement levels. Another tactic that may be employed to maintain EDP's relevance in the eyes of customers is the personalisation of advertising through **regionally tailored copy** (either online and/or OOH). For example, EDP could announce that with the efforts of x communities, the carbon footprint of region x has

decreased by x% (example: "With the help of 20 communities, Almada was able to reduce its carbon footprint by 10%").

9.8 People

From customers to employees, everyone is a valuable member of the service process. For the *Bairro Solar EDP* service, three different groups of service personnel can be identified. First, there are the sales channels employees, including the in-store salespeople, the door-to-door salespeople, the agents, and the telemarketing and contact-centre employees. These are responsible for customer service, telemarketing operations, and selling the service. Then the specialized qualified technicians oversee the on-site visit for the feasibility assessment and the installation and maintenance of the solar system. Finally, there is the product development team as well as the other supportive departments – e.g., legal, marketing, etc. These are the employees responsible for decision-making, managing the service from A to Z, improving the processes, and developing new functionalities.

Customers also play an important role in the service process. They need to create or join an existing community in the online simulation. Yet, customers are not all the same; while some may have the knowledge, skill, and resources to perform their assigned tasks (capability), some may not; the same happens with how much effort they seek to invest in the process. To manage this variability, the online platform must be simple and intuitive. On the landing page, there is a “how it works” section to inform customers on all they need to know to be part of a solar community. Customers can also straight-away search for already existing communities or find a community near their house in case they desire to be a neighbour – they just need to type in their full address. In case they prefer to be a producer, they have the possibility to run the simulation consisting of three steps: insert the address to bring up the satellite view map of their neighbourhood; highlight the size of their roof by drawing on the picture; insert the final information to complete the simulation (e.g., average monthly electricity bill).

By allowing customers to participate on the process, EDP cuts down the time and costs associated with the phone calls or store visits that would have to take place instead. Moreover, customers are able to complete the process in a more efficient, more convenient and faster manner. Only if necessary, customers can use EDP's phone lines or physical stores to clarify any doubts they may have. This do-it-yourself approach allows customers to have a higher customised participation on the entire process, while cutting down costs for EDP.

9.8.1 Training

EDP should implement effective training programs that seek to internalize the brand values, in order to achieve authentic brand-aligned performances by its employees. Training will have a higher importance in the first months/year the service is launched, where customers will have more questions and need to be nurtured. Moreover, frontline employees must be able to anticipate the needs and doubts customers will have about the service, exhibit a positive service attitude and expertise to inform customers about all the benefits of solar communities, and enjoy getting to know the customer personally so that the focus can be on highlighting what is important to them. This is also part of the service excellence model developed in Correia (2021), on the employee's section

9.8.2 Motivating and Energizing People

Great employees are not only great due to their skills and expertise, but also due to their proactive attitude and disposition to improve. EDP should provide their employees effective performance appraisals and incentive systems, offering not only a job but also motivation to excel, by aligning the brand's purpose with the spirit of their employees (O'Reilly and Pfeffer 2000). Effective incentives can take the form of sales commissions for salespeople, but for other positions, it is suggested a focus on an internal marketing empowerment program and a reward system for strong service performers – which depends on the tasks that differ among teams.

10 Profit and Loss

The profit and loss, hereinafter referred to as P&L, analysis includes three different scenarios following the range proposed in the market potential chapter. However, as seen in the concluding parts of this chapter, it is clear that even the pessimistic view still provides profit to EDP, albeit in a longer time frame. For the next chapters of the P&L the focus will be on the expected scenario. It is advised to use exhibit 74 for the reading of the next chapter.

10.1 Inputs and Assumptions

To future proof and better understand how the P&L behaves, a few variables (Exhibit 75) were defined. It is important to start this explanation by referring that all the values below were provided by the EDP team and are subject to change, due to innovation, economy evolution, etc. The **panel's efficiency percentage** considers the depreciation and loss of efficiency as time goes by, in this case 0.7% per year. **Panel's peak production** or kilowatt peak (kWp) represents the rate at which the energy is generated at peak performance. For EDP's panels, kWp equals 0.3. The **panel's production** refers to how much energy (kWh) is produced for every kWp of module capacity over the course of a year. A few factors might influence the variability of this input like location, weather variability, orientation of the panels etc. The next two inputs are linked to the **discount per kWh** that the producer or neighbour would get if they joined the community, these are €0.06 and €0.04, respectively. Selling to the **market tariff** is the rate at which EDP will sell the extra energy to the grid, produced by the solar panels that will not be consumed by the community. **WACC** is the average rate a company expects to pay to finance its assets (Seth, 2019). According to EDP, this rate amounts to 6%. **VAT** is a type of taxation that is imposed on the price of a product or service. The enforced VAT for selling energy is 23%. Then there are **administrative costs** that include and are limited to the processing expenses associated with new EDP customers. The **cost factor** contains the cost of panels, inverters, installation, maintenance and totals €750 per kWp. The input for **salesforce** for both neighbour and producer amounts to €10 and €100, respectively and it includes the cost

of convincing a potential customer to join *Bairro Solar EDP*, consisting of the costs of the call-centre and the door-to-door salesperson expenses. The yearly margin for new EDP customers and the percentage of new customers symbolizes the **margin** that EDP will make with new customers to the brand. For this project, 10% of the total customer base of *Bairro Solar EDP* are new to EDP and their margin is €15 per customer per year. Finally, **duration** represents how long the project will last.

A few concepts need to be detailed before delving deeper on the results of the P&L. For instance, **self-consumption** represents the percentage of energy produced by the solar panels that will be consumed by the household. **Annual consumption** represents the average amount of power consumed per year. **Production** is the product between the proportion of annual consumption, panel's efficiency, panel's peak production, panel's production and number of panels and it symbolises the amount of power produced. **Network reduction** represents the percentage of grid decrease usage for the household; it is the ratio between average household annual consumption and self-consumption. Lastly, **savings** represents the amount of money saved by consuming solar energy.

In this report, four different **types of communities** were assumed to be the closest representation of the future of *Bairro Solar EDP*. There are two sizes for each community and two different levels of performance, according to self-consumption percentages. In terms of **size**, there is one set of communities with four members, one producer and three neighbours, and another with nine members, two producers and seven neighbours. Concerning **self-consumption**, one set of communities has 40% and the other has 75%. **Number of panels** per community were defined by the EDP team.

10.2 Results

There are two sources of revenues in this project. **Energy Sold** depends on the type of community but the totality of this factor will be the sum of all revenues from all communities. The first step is to double-check if the input duration accounts for the year in question, meaning

if duration is equal to zero, revenues will also be equal to zero. Then, the solar energy that is self-consumed will be sold by EDP at a discount. This price varies accordingly to the tariff and the solar tariff discount of neighbour and producer. Afterwards, the energy not consumed is sold to the market and it is added to the computation before, accordingly. The **new EDP customer margin** is the added value brought by new customers to EDP. The **costs** of this project reflect the inputs above and the number of communities per year. **Depreciations** are done on a 25-year straight line analysis, also over the number of communities per year.

10.3 Limitations

The development of the P&L surfaced some concerns and provided soe limitations. Firstly, there is the fact that all of the inputs presented before are subject to change. The expected growth and the number of people in each community are estimations and are also subject to change. Lastly, after selecting the business model with the MFV one concern arose which only applies in a very specific situation, however it is still a limitation. Whenever the discounted amount per month of a neighbour is higher than the one from the producer – this might occur if the neighbour consumes much more electricity in a given month – it might provoke animosity and confusion for the producer as he supposedly is the one that should get the larger discount.

10.4 Conclusions

The net present value (NPV) is the sum of taxes, investment and operational cashflows discounted at WACC. The operational and taxes effect may be considered typical for a project this size; however, the investment cash-flow seems to be extremely negative, around €2,5M. This is primarily because of the high upfront investment to create these communities including costs of purchasing solar panels. Therefore, year three constitutes a positive turning point where a positive EBIT of € 0.54M will be obtained. In particular, this is due to the average growth rate of 16% within the first three years and the market penetration of 7.2% after three years. Nevertheless, for the expected scenario, the NPV over 15 years is around **€4.3M** and over 35 years around **€9.8M**. In the utility market, the expected return on an investment often lasts

longer than usual, which is why the time periods chosen for the NPV assessment may seem long. The IRR, which is also a good estimator for potential profitability, amounts to **9.1%**. Since an IRR of 10% in the energy sector may be classified as remunerative in southern Europe (Bertsch & Di Cosmo 2018), this project presents a favourable investment opportunity and should be executed. Exhibit 76 shows the comparison of these factors in the three described scenarios, optimistic expected and pessimistic.

11 Contingency Plan

Contingency planning is a proactive strategy that provides guidance in the form of steps or course of actions that need to be taken in response to foreseen and unforeseen disruptive events, to minimize their negative impact (Knight 2001). The launching of a new service is usually surrounded by a high level of uncertainty. Keeping in mind that everything might not go exactly as planned, a contingency plan was designed to help EDP be prepared for unexpected events that may harm the success of *Bairro Solar EDP*.

The first step is to identify the primary resources EDP possesses to deliver the service. Here, it includes the company's service personnel, relationships with suppliers, storage facilities, information systems, and the solar panels. The next step is to identify what could have a negative impact on these resources, as well as external events that could jeopardize the business. To do that, a mind map was designed to categorize and organize the key risks to *Bairro Solar EDP*'s performance (Exhibit 77). After defining the primary risks associated with the business, the following step is to evaluate and prioritize them in terms of their impact and probability of occurrence. The risk probability and impact matrix may be seen on Exhibit 78. The final step is to create an action plan for each risk identified earlier, that is, what needs to be done to resume normal service operations. This is represented on Table 1:

Risks	Actions
Competition	In case competitors start displaying aggressive behaviours – i.e., launching a similar service of solar communities, or replicating *Bairro Solar EDP* in any way –, EDP should increase marketing expenditures on solar communities, to sustain a dominant share of voice and preserve its position as market leader in customers' minds. EDP should also reassess its offering and consider differentiate its value proposition or lower prices
Resources	To avoid shortages in inventories, EDP must constantly revise its stocks and make sure resources are kept up with demand. To do this, it is essential that the company maintains a healthy and efficient relationship with its suppliers, avoiding any payment delays or conflicts. EDP can also withhold an alternative portfolio of suppliers to assure stability in inventories
Customers	To deal with low customers' adoption or satisfaction, EDP should perform regular market research, including customer satisfaction surveys. Being a new service, it is crucial to understand what customers are saying about it (i.e., keep track of word-of-mouth), hence, EDP must actively monitor social media channels. The company should also benchmark other successful services outside of Portugal, that are similar to *Bairro Solar EDP*, to grasp what customers value. In case of a lower penetration in the first year of the service launch (around 1.5% according to our pessimistic scenario in the market potential section), EDP should increase the budget for the marketing campaign in the second year
Cost and Environmental	To deal with unexpected costs (e.g., exceeding budget) or possible catastrophes that would damage EDP's assets and reduce its value, the company should set aside a reserve fund

Table 1 - Action plan for each selected risk

12 Limitations

Even though *Bairro Solar EDP* is a promising service with high probabilities of success, there are some limitations associated with it. Firstly, there might be delays in the implementation of the service due to legal conditions and authorizations. Secondly, Portugal, along with the rest of the world, faces a very difficult economic period due to COVID-19, meaning that there could be a drop in demand that will undermine the success of the service in the first few years. Other obstacles might arise from unpredictable weather conditions (e.g. less sun, more storms etc.) of a respective year that might reduce the overall solar energy produced in the communities, which will then have an impact in the customer satisfaction through the inferior discounts in the electricity bill. Another limitation is related to market penetration, meaning that as there are many conditions for the implementation of the service, *Bairro Solar EDP* may not reach its market potential. Lastly, the number of communities could increase to the point where EDP is

no longer able to manage them without additional resources, such as new software, more employees or staff.

13 Final thoughts

Turning back to the management decision problem: **How to launch solar communities?** The best evaluated approach is an As-a-Service business model with a **minimum fixed value** so that EDP is able to share the risk. EDP will be the **owner** of the communities with the active role of the **manager**, i.e. EDP will only land the solar panels and will be responsible for distributing the energy proportionally among the community members, according to each individual's consumption. In case a producer decides to leave, he has to pay a **removal fee** due to contractual conditions, while the neighbours are free to leave at will. The **value proposition** is that it offers a revolutionary community-based service that **reduces electricity bills without any investment** and eliminates the negative association of solar solutions (long payback period). The brand *Bairro Solar EDP* will be closely linked to the branding of EDP to keep **brand values** and reliability. In terms of pricing, there will be **different discounts** for the producer and the neighbour due to different levels of responsibility. In terms of marketing channels, EDP should focus on **remote channels**. Regarding advertising, EDP has to focus on the value proposition in a **relatable manner** so that potential customers perceive it as relevant and thus desire to learn more.

The **potential** for such service is enormous: it is the **first on the market** to power literally everyone. Similarly, it provides EDP with micro-power plants that allow them to **decarbonise**, **decentralise** and **digitalise**, helping Portugal to achieve its goals of carbon neutrality as fast as possible.

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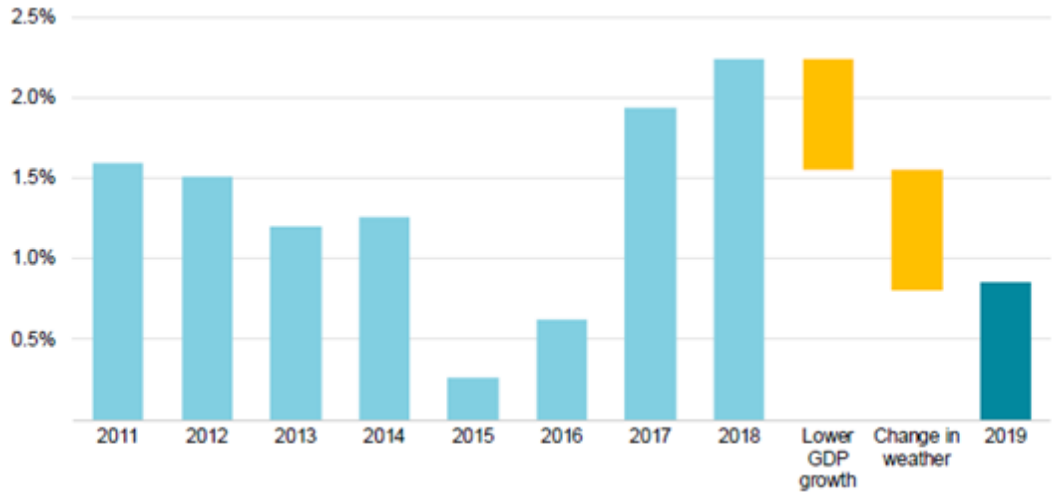
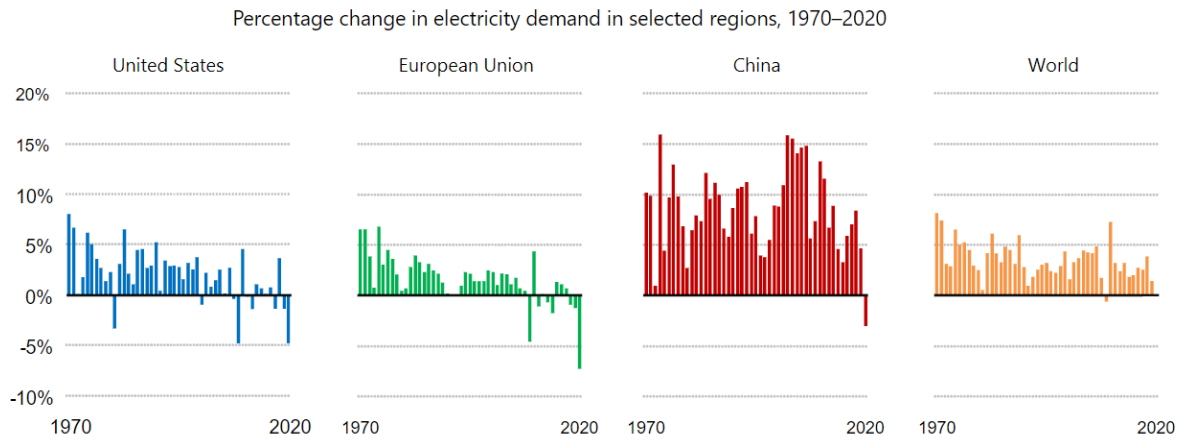
15 Appendix

Exhibit 1 – World energy demand growth rate, 2011-2019



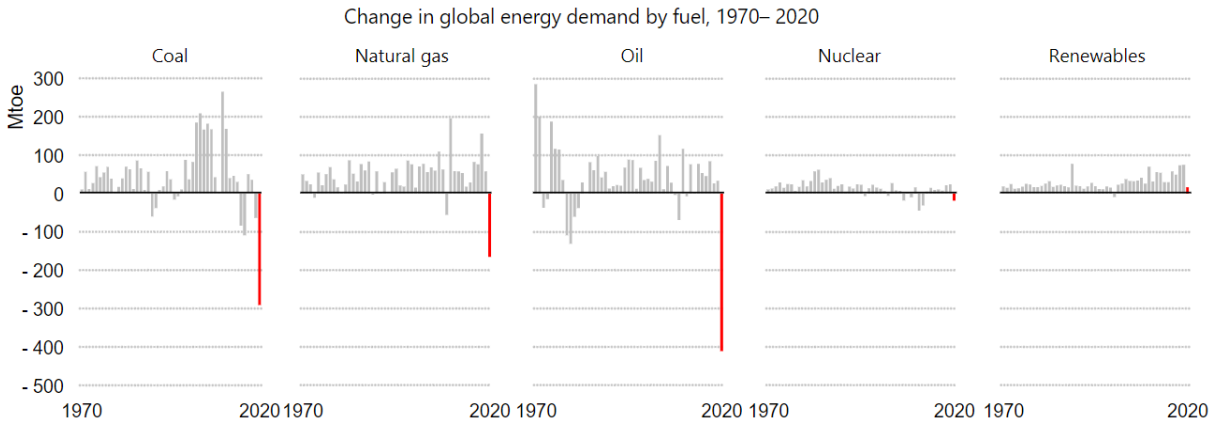
Source - IEA. All Rights Reserve

Exhibit 2 – Electricity demand to face the biggest decline



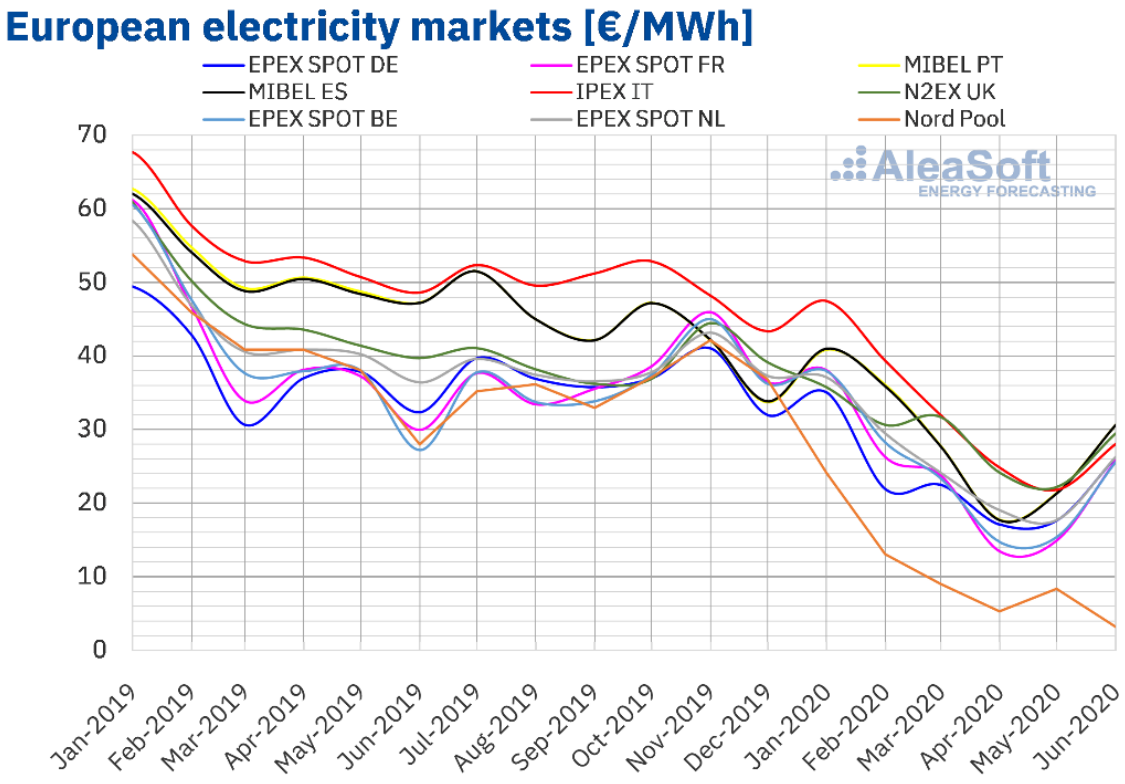
Source - IEA Global Energy Review 2020

Exhibit 3 – Global Energy demand on different sources



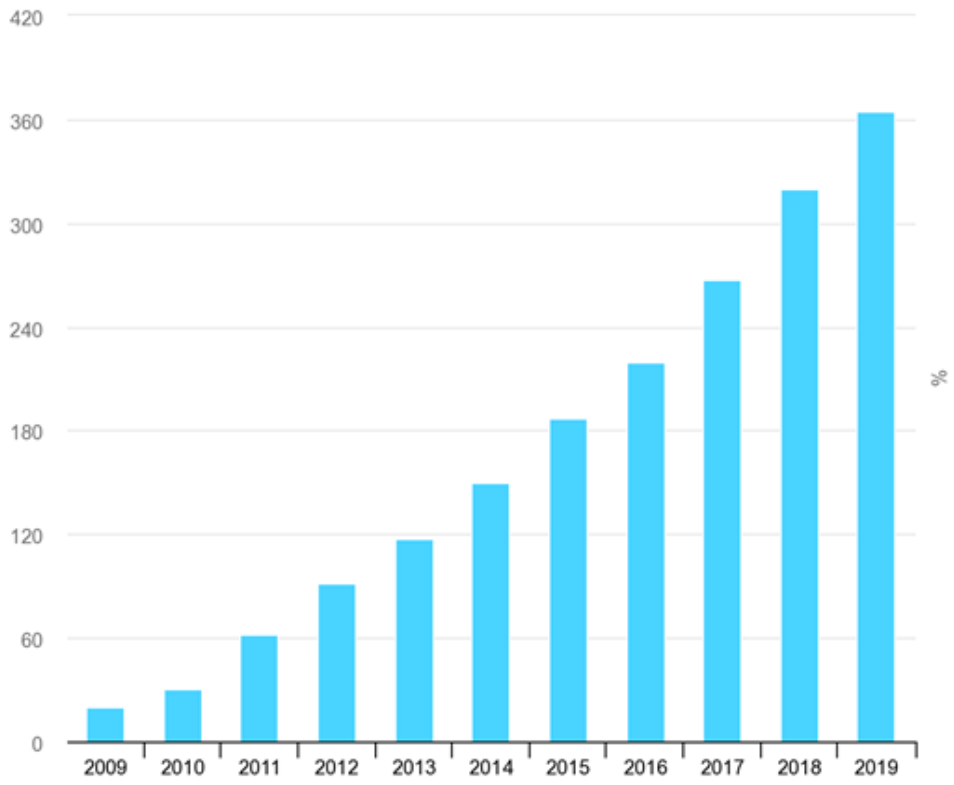
Source - IEA Global Energy Review 2020

Exhibit 4 – European electricity markets price decline



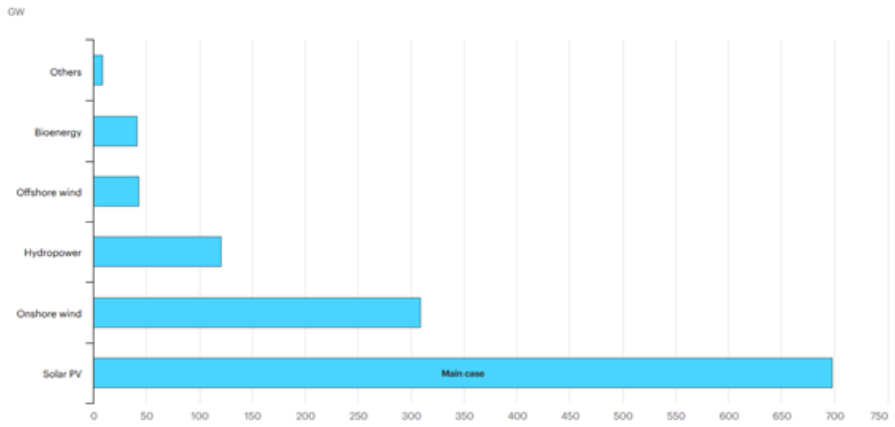
Source - AleaSoft Energy Forecasting

Exhibit 5 – Yearly solar production in OECD countries, 2009-2019



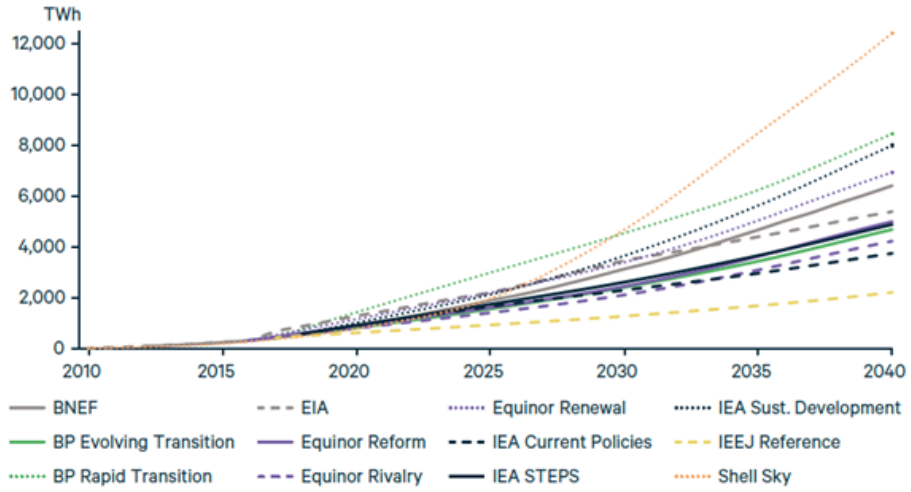
Source - IEA. All Rights Reserved

Exhibit 6 – Renewable capacity growth between 2019 and 2024 by technology



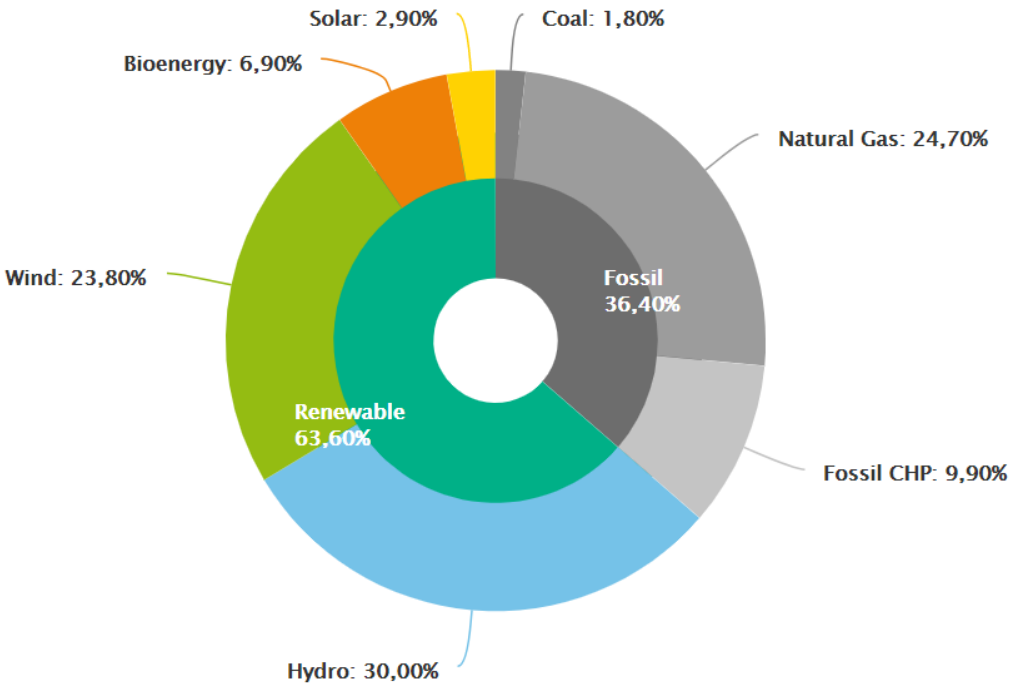
Source - IEA. All Rights Reserved

Exhibit 7 – World Solar Electricity Generation



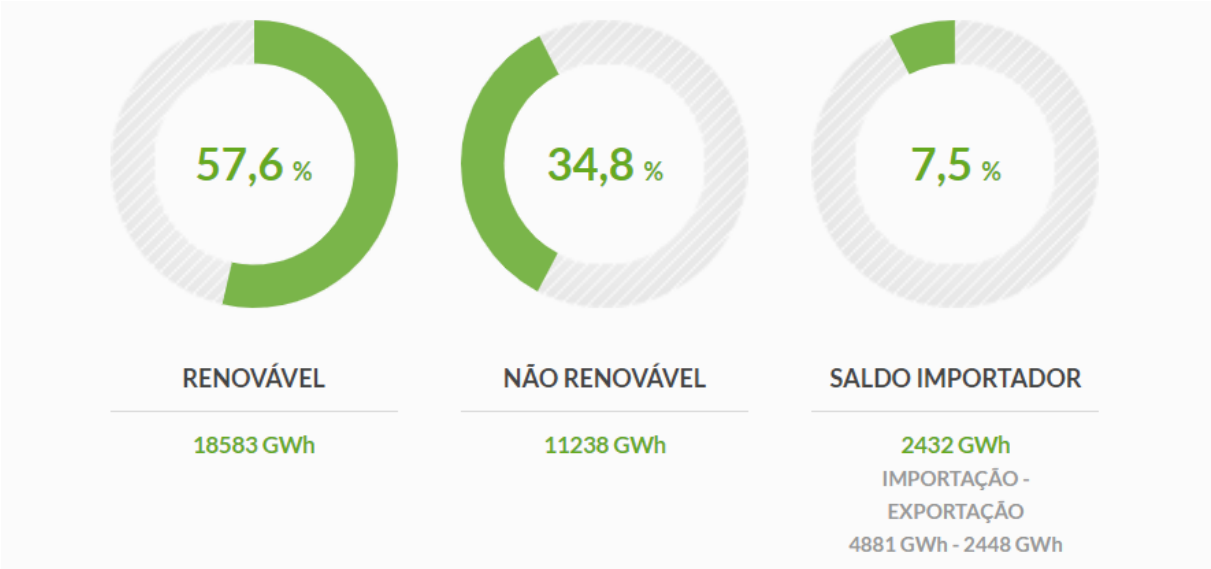
Source - Global Energy Outlook 2020: Energy Transition or Energy Addition?

Exhibit 8 – Electricity production mix in Portugal Continental



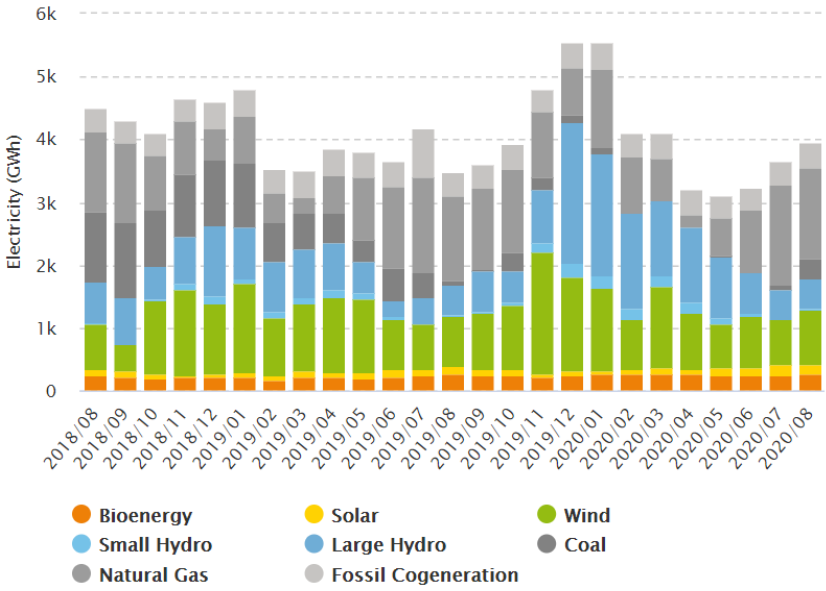
Source - APREN (Associação de Energias Renováveis)

Exhibit 9 – Production repartition from JAN - AUG 2020 in Portugal



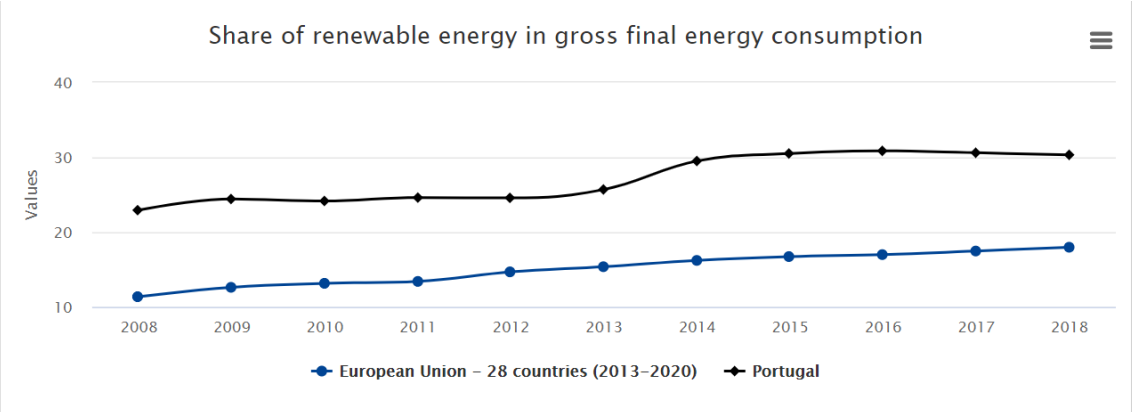
Source - APREN (Associação de Energias Renováveis)

Exhibit 10 – Distribution of the electricity generation by source (August 2018-August 2020)



Source - APREN (Associação de Energias Renováveis)

Exhibit 11 – Portugal Reaches its national goal in 2018



EU target: 20 % from renewable sources
National target: 31% from renewable sources

Source - Eurostat European Statistics

Exhibit 12 – Tesla's Example

Tesla disruptively entered the energy sector in the United States through the selling or renting of solar panels. Tesla's innovative solar solution starts with an online and virtual process in which the company gathers a remote aerial imagery of the customer's house and designs the best system. After the installation is done, customers can manage the system from anywhere through mobile monitoring[11]. Alternately to buying the panels, Tesla also has a subscription model that allows customers going solar without the upfront investment of purchasing the system. Customers pay a monthly rate that includes the installation and maintenance of the panels, but not the ownership of the system.

As for local drivers for change, a new law was published in the end of 2019, introducing new concepts like collective self-consumption and communities[12]. This novelty represents an opportunity for EDP to explore new products and services and assert its position as the market leader in Portugal. The creation of solar communities is entirely aligned with the major trends

[11] https://www.tesla.com/solarpanels

[12] https://dre.pt/web/en/home/-/contents/125692189/details/normal

impacting the energy system. EDP has the potential to completely revolutionize the electricity market in Portugal.

Exhibit 13 – SWOT analysis for EDP

Strengths:

- High bargaining power – controls entire supply chain (EDP production, distribution, commercial)
- Strong market presence – 4 continents, 19 countries, 11,700 employees, 11 million customers
- Strong brand value and customer relationships – 40 years of expertise (Consumer Choice 2019)
- High efforts in integrating sustainability in its value chain – member of the Dow Jones Sustainability Index (DJSI) World for 12 years, member of the DJSI Europe for 10 years
- Publicly traded company – allows for easier CAPEX

Weaknesses:

- Very large company – internal barriers due to hierarchy, regulations, etc.
- Lack of diversification – present only in the energy market, no flexibility to change
- Lack of customer support – negative customer feedback
- Tarnished brand image – due to current corruption probe (naming CEO Antonio Mexia as a suspect in a corruption investigation)

Opportunities:

- Sustainable development – growth opportunities in renewable energy
- Climate change – increasing consumer awareness and clean-energy revolution
- Complex energy market – opportunity to simplify and mitigate customer perception
- Nº of sunny days per year in Portugal

Threats:

- Increase in competition within the industry
- Threat of new entrants – non-energy focused companies that are breaking the entry barrier on the service side of the business (ex: MEO, IKEA);
- Extremely regulated market

- New market opportunities
- Climate change and other disastrous conditions impact mostly clean energy production for EDPR

Exhibit 14 – Competitors' Analysis

endesa	The second largest energy provider in Portugal makes use of endorsement campaigns with familiar faces to the Portuguese audience to promote its campaigns. The brand aims to invest 6.6 billion euros in Portugal until 2022, mainly in renewable energy, electric mobility and intelligent networks[13]. 'Endesa X', a new sub-brand which aims to revolutionize the way of accessing and using energy, will soon be launched in Portugal[14].
IBERDROLA	The Spanish company has been implementing a marketing strategy based on increasing brand awareness in Portugal. In 2019, they acquired 73,000 new electricity clients[15] and, in 2020, Iberdrola invested in product placement during SIC's morning show, a strategy previously adopted by EDP. In January 2020, this company introduced solar communities in Spain offering each neighbour 30% minimum savings[16]. The first Spanish community used 60 solar panels whose energy was shared by 30 neighbours.

[13] https://www.dinheirovivo.pt/economia/endesa-investe-66-mil-milhoes-em-portugal-ate-2022/

[14] https://expresso.pt/economia/2020-07-12-Endesa-lanca-novo-negocio-em-Portugal

[15] https://www.erse.pt/media/w4dpnu3d/relat%C3%B3rio-sobre-os-mercados-retalhistas-de-eletricidade-e-de-g%C3%A1s-natural-em-2019-em-portugal.pdf. Entidade Reguladora Dos Serviços Energéticos.

[16] https://www.lavanguardia.com/vida/20200115/472911545739/economia--iberdrola-instala-el-primer-sistema-de-autoconsumo-solar-colectivo-en-una-comunidad-de-propietarios-en-madrid.html

	MEO, a telco brand of Altice, is the Portuguese provider with the largest share of bundled service subscribers representing 40.4% of that market[17]. Altice's entry into the energy sector is part of the portfolio diversification strategy led by CEO Alexandre Fonseca. The service will be exclusive to MEO customers and will offer not only monthly savings and 100% green energy but also extra cellular data[18]. The trend of telco companies expanding to the energy sector goes beyond Portugal, as in the UK, Vodafone's smart metering solution is already a reality[19] and, in Australia, the telecommunications company Telstra will offer entire-home connectivity packages including internet, phones and solar[20].

Exhibit 15 – SWOT analysis for EDP's Solar Communities

Strengths:	Weaknesses:
- First mover, pioneer advantage in the Solar Communities category	- EDP's tarnished brand image – due to current corruption probe (naming CEO Antonio Mexia as a suspect in a corruption investigation)

[17]https://www.anacom.pt/streaming/pacotes1Trimestre2020_enGB.pdf?contentId=1547381&field=ATTACHED_FILE. Anacom.pt.

[18] https://www.telecom.pt/pt-pt/media/noticias/Paginas/2020/julho/A-Eletricidade-chegou-ao-MEO-Ligue-se-a-uma-nova-Energia.aspx. Telecom.pt.

[19] https://www.vodafone.co.uk/business/media/document/doc-why-vodafone-for-utilities.pdf. Vodafone.co.uk.

[20] https://www.greentechmedia.com/articles/read/Will-Telecom-Companies-Kill-Utilities.

- Strong brand value and customer relationships – 40 years of expertise (Consumer Choice 2019)
- Very large company – possibility of economies of learning and synergies between individual and communities' projects
- It allows to achieve economies of scale
- It will allow customers to have renewable energy without having panels at home and making an initial investment
- The customer does not have to worry about the performance of the solar panels.

- Additional costs with communities' management and information systems.
- Customers need to meet the requirements to qualify for a solar community (case-by-case analysis by DGEG considering, among others, the associated tension levels or any technical or regulatory element), which reduces the potential market for this business.

Opportunities:

- Sustainable development – growth opportunities in renewable energy
- Climate change – increasing consumer awareness and clean-energy revolution
- Nº of sunny days per year in Portugal.

Threats:

- Increase in competition within the Solar Communities category
- Climate change and other disastrous conditions impact mostly clean energy production for EDPR
- In the future, customers may become EDP competitors because they would be able to produce, distribute, store and manage their own energy
- Unpredictability of customers' consumption.

Exhibit 16 – Business models descriptors

	Service	Service w/ MFV	Transactional	Subscription
Panels ownership	×	×	✓	×

Cash upfront	×	×	✓	×
Contractual commitment	✓	✓	×	×
MFV	✓	×	×	×
Removal fee	✓	✓	×	✓
Value charged according to consumption	✓	✓	×	×
Amount charged/month	×	×	…	✓
Installation, maintenance, community management	edp	edp	×	edp

Exhibit 17 – Risk evaluation of EDP's business models

Risk

Indicators	Criteria	Business models				Weight
		Service	Service w/ MFV	Transactional	Subscription	

EDP's investment	Low = 1 Medium = 3 High = 5	5	5	2	5	13%
Rivalry and threat of new entrants	No competition = 1 Highly competitive = 5	2	2	4	2	11%
Complexity to develop	Easy to develop = 1 Very complex = 5	4	4	2	3	7%
Asset management	EDP does not own panels = 1 EDP owns panels = 5	5	5	1	5	18%
Payback Period	< 5 y = 1 5-10 y = 2 10-15 y = 3 15-20 y = 4 > 20 y = 5	5	4	1	3	7%
Electricity Tariff Exposure	Low exposure = 1 High exposure = 5	5	4	1	3	12%
Payback Security	Payback guaranteed = 1 No guarantee of payback = 5	3	2.5	1.5	2	32%

Exhibit 18 – Potential evaluation of EDP's business models

Potential

Indicators	Criteria	Business models				Weight
		Service	Service w/ MFV	Transactional	Subscription	

Time to market	< 1 y = 5 1-2 y = 4 3-4 y = 3 5-6 y = 2 > 5 y = 1	4	4	5	4	18%
Revenue to EDP	Big revenue = 5 Low revenue = 1	4	4	2	5	23%
Potential market/consumers' acceptance	High = 5 Medium = 3 Low = 1	5	5	1	3	18%
Alignment with brand current positioning	Perfectly aligned = 5; Not aligned = 1	5	5	4	1	18%
Brand extension/Cross-selling possibility	Possibility to add extra services = 5; More difficult = 1	5	5	2	5	23%

Exhibit 19 – Risk potential matrix for EDP's business models

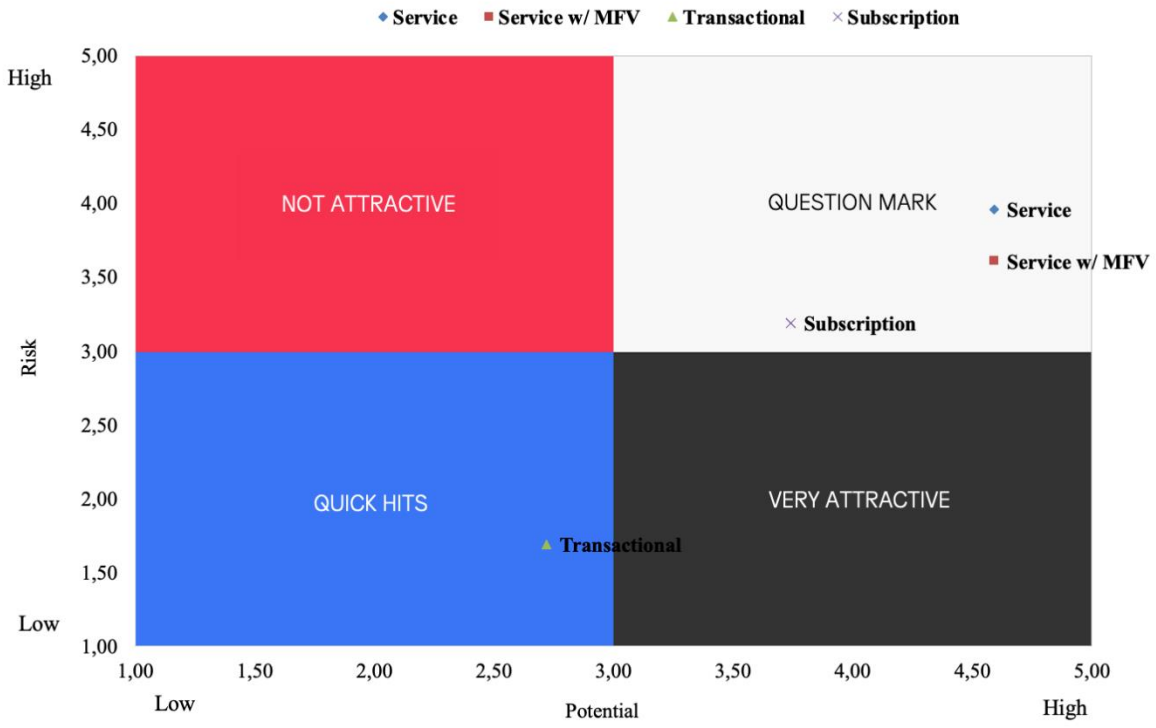


Exhibit 20 – Interview guide for qualitative research

INTERVIEW GUIDE

Warm Up:

Good afternoon, my name is _____ I am a Masters student at NOVA SBE and I am currently working on my thesis. The topic of this thesis is related to the energy sector in Portugal and we are conducting some research among consumers to answer some questions. To do so, I would like to interview you for 45 minutes approximately by conducting an in- depth interview, which means I will let you speak freely and ask very few questions. This means there are no right or wrong answers and you are free to say whatever thoughts you have on the subjects presented.

In order to later analyse this interview, I would like to record it, if it is okay with you. The interview is completely anonymous and you will not be contacted any further.

Filter 1:

Do you live in a house in Portugal?

Yes [go to filter 2] No [Thank you for your time]

Filter 2:

Have you lived in Portugal for at least 3 years?

Yes [Go to filter 3] No [Thank you for your time]

Filter 3:

Do you currently have solar panels or use solar energy to power your home?

Yes [Thank you for your time] No [Go to interview guide]

Section 1 – SOLAR ENERGY AWARENESS

Broad question: Have you ever thought of investing in sustainable sources of energy for your own House?

- Existing Providers (Reason for choice)
- Knowledge of Installation, Pricing and Spending (Prices and financing options)
- Main drivers for not adopting solar energy
- Purchase enablers
- Attitude towards solar (opinion on it, etc...)

Section 2 – IN-DEPTH Consumption & Experience

User **Experience**

Tell me a little bit about your energy provider.

Topics to explore:

- How and why did you choose your utility provider?
- Reason for staying with them?

Do you know anything about their solar options? Have you considered going solar? Why/why not?

Do you know anyone who has a RSE? If yes, what was their feedback?

Energy consumption patterns

Has your energy consumption pattern changed in the past 6 months (due to COVID-19)?

- What's your average bill (electricity cost only)?
- What time of the day do you consume more energy?
- If you joined solar, do you think that you would change your current consumption routine? How?

Section 3 – BRAND AWARENESS & BRAND PERCEPTION

Projective technique - Word Association

- When you think of solar energy which company comes to your mind?

1st brand mentioned – Top of Mind: ……

Other brands recalled: ……

Out of the following brands, which ones do you recognize?

ACCIONA Energía	
Alfa Energia	
Aldro Energía y Solucíones	
Audax Energia	
Axpo Portugal	
Cepsa	
Clidomer	
ECOCHOICE	
EDP Comercial	
ENAT Energias	
Elergone Energia	
Endesa	
Enforcesco	

FORTIA	
Fenosa	
G9 Energy	
GALP Energia	
GoldEnergy	
HEN	
Iberdrola	
JafPlus	
Logica Energy	
Lusíada Energia	
LuzBoa	
Muon Electric	
ODF Energía	
PH Energia (Simples Energia)	
PT Live / MEO Energia	
Rolear Viva	
Usenergy	

Source: ERSE, 2020 (List of active electricity traders in Portugal on December 31 , 2019).

- Please come up with 3 categories and allocate the following energy brands to them: (EDP, Endesa, Iberdrola, GALP, MEO Energia)?
- What would make you change energy providers?

Section 4 – CONSUMER BEHAVIOUR

Imagine you are advising a friend **in a world without COVID**. Your friend is going to have a meeting that is taking place in Zurich next week, and his boss gave him two options to choose from. Either attend the meeting via a Zoom call or take a plane to Zurich?

Show two T-shirts one sustainable and other non-sustainable – ASK HIM TO PRICE IT.

Non-sustainable t-shirt

Sustainable t-shirt

Section 5 – PROJECTIVE TECHNIQUE

- How would you describe a person that uses solar energy?
  - Personality traits
  - Habits
  - Lifestyle - likes and dislikes
  - Physical aspects (clothes, hair etc)
  - Job and education
  - Music taste
  - Transportation

We're doing a project for EDP that is planning to launch a new service. The goal is to understand how to launch it.

- Draw the typical EDP customer. Why did you draw it that way?

Section 6 – Testing Solar Community

INTRODUCTION

PT: O acesso à energia solar está a ser revolucionado. Apresentamos o *Bairro Solar*. Comunidades de energia onde todos podem receber energia solar e poupar na fatura da eletricidade. Quem tem espaço pode instalar painéis solares pela empresa fornecedora de energia: são os Produtores. Quem não tem espaço ou não quer instalar painéis pode simplesmente juntar-se a um bairro próximo de si: são os vizinhos. Tanto os produtores como os vizinhos vão receber parte da energia produzida no bairro com um desconto. O maior objetivo é partilhar energia renovável produzida localmente, sem investimento inicial (geralmente associado à energia solar), enquanto economiza nas contas de luz.

EN: The access to solar energy is being revolutionized. Suppose communities of Solar Energy Neighbourhoods are going to be introduced in the market. This will be constituted by Producers and Neighbours. Those who have space can install solar panels by the energy supplier company: the Producers. Those who do not have space or do not want to install panels can simply join a neighbourhood close to them: the neighbours. Basically, there will be 1 or 2 producers for a certain number of neighbours, in which both producers and neighbours will receive part of the energy produced in the neighbourhood at a discount. Overall, the main goal is to share locally produced renewable energy, with no initial investment (usually associated with solar energy), while still saving on electricity bills.

Broad question: Would you be willing to share the energy you produce with your neighbours? Why / Why not?

- How would you feel about being part of a solar community?
- What benefits / disadvantages do you see in sharing the energy you produce with your neighbours?
- Do you have space in your roof? If yes, would you be interested in becoming a producer?
- Which one do you prefer: being the neighbour or the producer? Why?

Imagine you would be part of a solar community. Which option do you prefer?

1. Your community invests in acquiring the solar panels (which averages around €10.000 depending on the number of members), becoming owners of the produced solar energy.

In this scenario, the community will own the panels and the solar energy produced, no contract commitment to energy providers. Maintenance and community management up to its members.

2. EDP installs the panels for free and owns the panels, and you receive solar energy with a discount.

On the other hand, in this scenario, there's no upfront investment, EDP takes care of maintenance, community management. There's a contract with EDP but neighbours are free to leave the community when they want.

Section 7 – Business Model

- Have your ever bought a car, in the past? If yes, did you buy it one-shot only or by instalments?

WRAP UP:

Alright! Coming to the end of the interview. I'd like to ask you some simple final questions that will help us characterize our sample.

- Please indicate the following:
    - Age(inyears):
    - Nationality:
    - Gender:

- Education: [SHOW LIST]
    - Can't read/ write
    - Less than 4th grade
    - 4th grade
    - 6th grade
    - 9th grade
    - 11th/ 12th grades

- Professional or Arts Degree
- Incomplete undergrad
- Undergrad
- Post-grad or Masters
- PhD

- Occupation: [SHOW LIST]
  - GO1–Middle and Top Management
  - GO2–Specialized Technicians and Small Business Owners
  - GO3–Employees of Tertiary Sector
  - GO4–Qualified/ Skilled Workers
  - GO5–Unqualified/ Unskilled Workers
  - GO6–Retired/ Unemployed
  - GO7–Students
  - GO8–Housewive

- What are your living arrangements:
  - Own house
  - Own apartment
  - Rented house
  - Rented apartment

Thank you very much for your time and feedback – your opinions are really important and we value them a lot! Have a great day!

Exhibit 21 – Qualitative research sample demographics

Gender	
Female	13
Male	17
Education	

12th grade	3
Incomplete Undergrad	2
Undergrad	12
Post-grad or Masters	13

Occupation	
Students	2
Employees of Tertiary Sector	13
Middle and Top Management	2
Qualified/Skilled Worker	5
Retired/Unemployed	1
Specialized Technicians and Small Business Owners	7

Living arrangements	
Own house and own apartment	3
Own house	27

Exhibit 22 – Survey for Quantitative Research

Start of Block: Filter Questions

Q1 We are Master students from Nova School of Business and Economics and we are currently conducting research on the energy sector, as part of our Master Thesis. We would love to hear from you about your current consumption habits and your feedback on a new service.

Duration: 10 minutes

We really appreciate your input!

Q2 Are you over 18 years old?

- Yes
- No

Skip To: End of Survey If Tem mais de 18 anos? = Não

Q3 Do you own a house in Portugal?

- Yes
- No. I live in an apartment

- Yes, but it's a vacation house

Skip To: End of Survey If Tem uma moradia em Portugal? = Não. Tenho apenas um apartamento

Display This Question:
If Tem uma moradia em Portugal? = Sim, mas é uma casa de férias

Q4 From now on, consider your **vacation house** the subject for the following questions.

Q5 Do you currently have photovoltaic panels to power your home?

- Yes
- No

Skip To: End of Survey If Utiliza painéis solares fotovoltaicos em sua casa? = Sim

Start of Block: Brand Awareness & Perception

Q6 What is your current energy provider?

- EDP Comercial
- SU Eletricidade
- Endesa
- Iberdrola
- MEO Energia
- Other

Q7 Please rank what you most value in your energy provider:

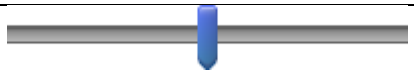
- It is a reliable brand
- It is Portuguese
- It offers low prices
- It has a smooth purchase process
- It is innovative and has efforts to develop new technologies
- It has quality customer service
- It is sustainable
- Other

Q8 What is your opinion regarding solar energy from 0 to 10? (0 = Totally Disagree and 10 = Totally Agree)

Expensive () 

Sustainable () 

Innovative ()



Complex ()

Risky ()

Q9 When it comes to solar energy:

- I am not interested
- I am interested in using solar electricity at home
- I am seriously considering solar options

Display This Question:
If Quando se trata de energia solar: = Eu não estou interessado

Q10 Please choose the one main reason for not adopting solar:

- Big investment, long payback period
- Not the right time in my life
- I do not have interest in it
- I do not have the financial resources
- It was not worth it for my consumption
- My house is not suitable
- Negative feedback from a friend or family member
- Other

Display This Question:
If Quando se trata de energia solar: = Eu estou interessado em usar energia solar em casa
Or Quando se trata de energia solar: = Eu estou seriamente a considerar o uso de opções solares

Q11 Why are you interested in using solar electricity? (Choose up to 3 choices)

- It has lower monthly energy costs
- To help the environment
- Family/friends recommended it
- It adds to my home's market value
- To gain more control and independence from my utility
- I want to be a good role model
- I want to be an early adopter of new technology
- To protect the quality of life for my kids and future generations

Display This Question:

If Quando se trata de energia solar: = Eu não estou interessado

Q12 Please rank the importance of the following attributes if you were to adopt solar energy

(1 = most relevant ad 5 = least relevant):

- Savings on the electricity bill
- Low impact on the environment
- Predictability of costs
- Autonomy
- Process simplicity

Start of Block: Energy consumption

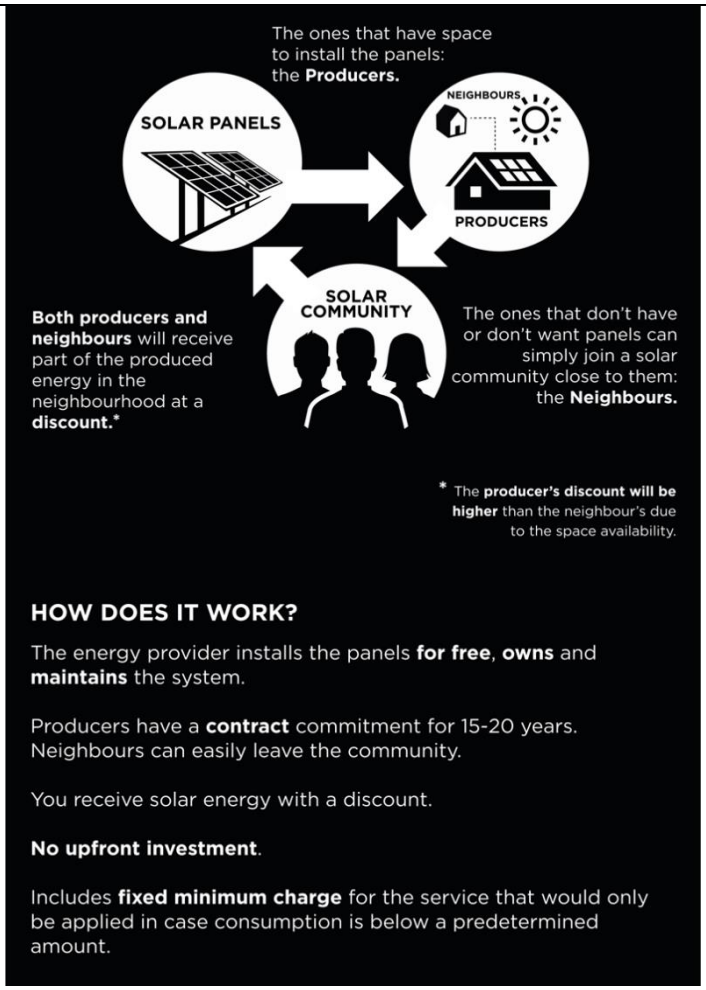
Q13 What is your average monthly energy bill?

- €0 - €50
- €51 - €100
- €101 - €150
- €151 - €200
- €201 - €250
- + €251
- I do not know

Start of Block: Solar Communities

Q14 Suppose that Solar Communities are going to be introduced in the market. Take a look

at the following graph:



Q15 Would you be interested in joining a solar community?

- Yes
- No

Display This Question:
If Estaria interessado em fazer parte de uma Comunidade Solar? = Não

Q16 Consider the reasons for **not joining** a solar community. Allocate 100 points among the ones relevant for you, according to their importance.

- I prefer to be independent
- I would prefer to own my solar panels
- I would not like to have solar panels on my roof
- I am not comfortable to share energy with my neighbours
- I feel the complexity of this service might create conflict
- I do not trust this service

- Other
- Total

Display This Question:
If Estaria interessado em fazer parte de uma Comunidade Solar? = Sim

Q17 Consider the reasons for **joining** a community. Allocate 100 points among the ones relevant for you, according to their importance.

- I can't afford the high upfront costs of solar panels
- It has no maintenance costs
- It offers monthly savings
- It is less risky
- It is a more sustainable option
- I do not want solar panels in my roof
- My roof is not appropriate for installing solar panels
- I value being part of a community
- I value having an utility company managing the community
- Other

Display This Question:
If Estaria interessado em fazer parte de uma Comunidade Solar? = Sim

Q18 Select which one you would prefer to be?

- Producer
- Neighbour

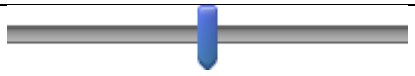
Display This Question:
If Prefere: = Ser Produtor

Q19 As a producer, to which extent do you agree with the following statements, from 0 to 10. (0 = Totally Disagree and 10 = Totally Agree)

I feel the incentives of being the producer will be worth it ()

I like the idea of having the panels in my house ()

I don't see myself switching houses in the near future, so why not become the producer in my neighbourhood ()



Display This Question:
If Prefere: = Ser Vizinho

Q20 As the neighbour, to which extent do you agree with the following statements, from 0 to 10. (0 = Totally Disagree and 10 = Totally Agree)

I don’t like the responsibility of being the producer so, I would rather be the neighbour ()

I am fine with the regular discount of being the neighbour even if it is smaller than of the producer ()

I might switch houses in the near future, so I would prefer the flexibility of being the neighbour ()

I like the idea of being the neighbour so I could easily leave the solar community ()

Q21 Out of the following options, select which ones might concern you when joining the solar community:

- Neighbours being able to leave easily
- Long contract for the producer
- The producer must carry all the burden
- Too many panels are not aesthetically pretty
- There might be some technical issues to sustain the whole solar community
- Fixed minimum charge for the service that would only be applied in some cases
- Suddenly having to move house, leaving the community
- Other

- None

Q22 Each time your monthly consumption does not reach a pre-determined amount, you pay a fixed minimum charge for the service. The charge would only be applied if your consumption is extremely low when compared to your monthly average. Example: You usually pay around €30/month on your solar energy. One month you go on vacation and you don't consume energy at home. In this scenario, a minimum charge of €10 would be applied. To which extent do you agree with the following statements, (0 = Totally Disagree and 10 = Totally Agree)?

I'm likely to join even with the fixed charge ()

This is a fair charge ()

Start of Block: Demographics

Q23 How old are you?

- [18 - 25[
- [25 - 35[
- [36 - 45[
- [46 - 55[
- [56 - 65[
- [66 - 75[
- More than 75
- Rather not say

Q24 Where do you currently live?

Q25 What is your gender?

- Male
- Female
- Other
- Rather not say

Q26 What is your marital status?

- Married
- Widowed
- Divorced
- Single
- Rather not say

Q27 Please indicate your occupation:

Middle and Top Management

Specialized Technicians and Small Business Owners

Public sector employee

Private sector employee

Unemployed

Retired

Student

Administrador/a da economia doméstica

Q28 Please indicate your education level:

Can’t read / write

4th grade

6th grade

9th grade

12th grade

Professional Degree

Incomplete undergrad

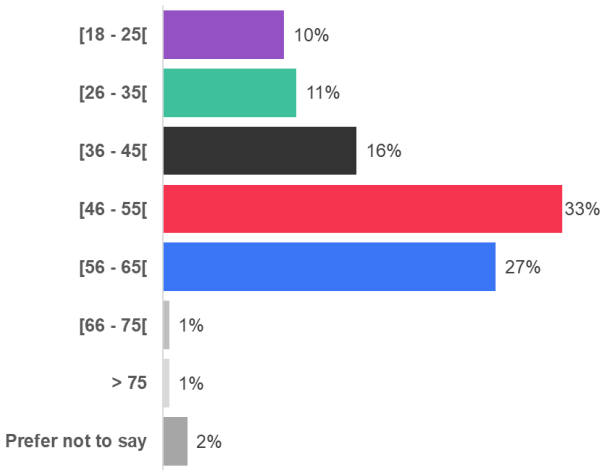
Undergraduate

Post-grad or Masters

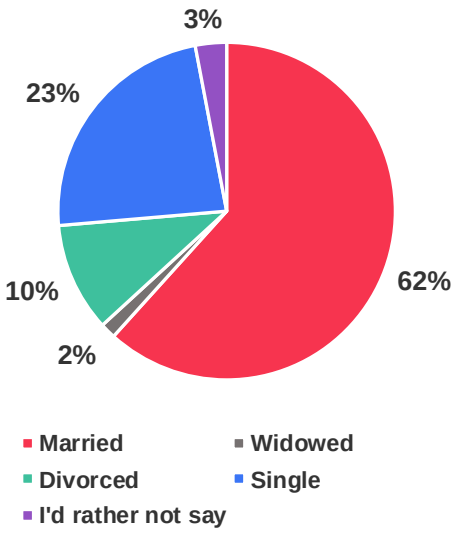
PhD

Exhibit 23 – Quantitative Research Sample

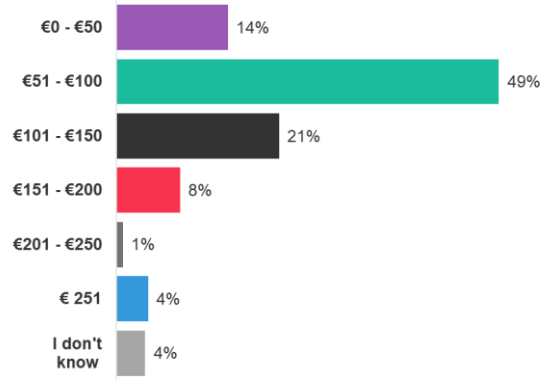
AGE



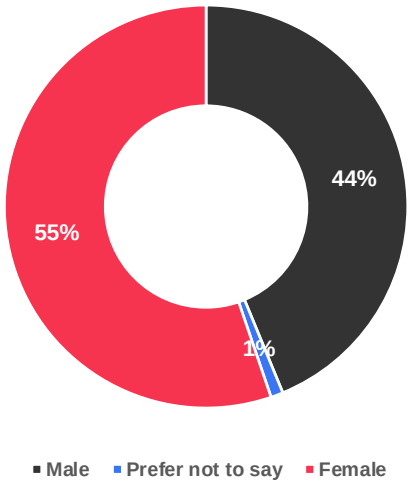
MARITAL STATUS

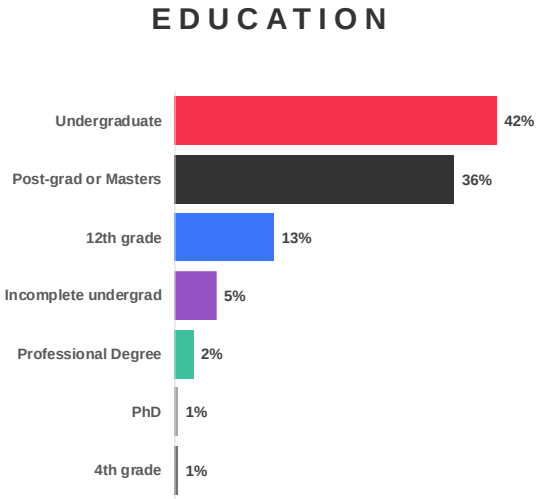


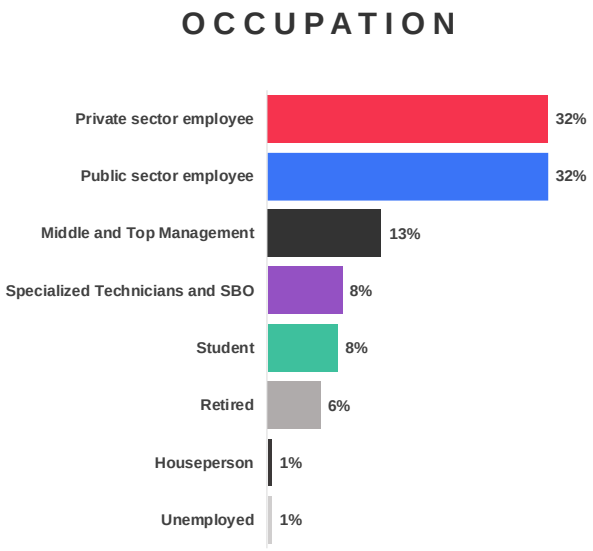
AVG MONTHLY SPENDING

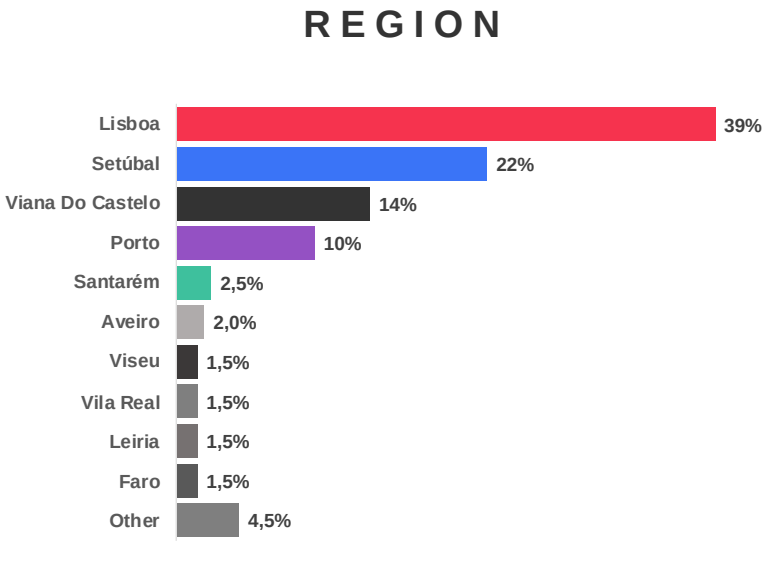


GENDER









x

Exhibit 24 – Respondent's Energy Provider

Exhibit 25 – Respondents openness to adopt Solar Energy

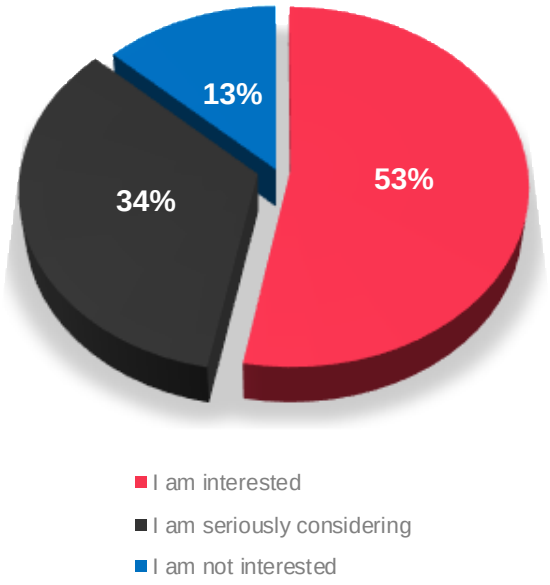


Exhibit 26 – Respondents that are interested or seriously considering solar energy according to age

Stub: Q9: Quando se trata de energia solar:

		Q23: Quantos anos tem?							
	não dizer	Total	[18 - 25[	[25 - 35[	[36 - 45[	[46 - 55[	[56 - 65[	[66 - 75[	Mais de 75
Total Count (Answering)	6,0	201,0	20,0	22,0	32,0	66,0	55,0	1,0	1,0
Eu não estou interessado	0,0%	12,4%	15,0%	9,1%	12,5%	13,6%	12,7%	0,0%	0,0%
Eu estou interessado...nergia solar em casa	83,3%	55,7%	70,0%	59,1%	43,8%	56,1%	54,5%	0,0%	0,0%
Eu estou seriamente ...so de opções solares	16,7%	31,8%	15,0%	31,8%	43,8%	30,3%	32,7%	100,0%	100,0%

Exhibit 27 – Respondent's reasons for interest in joining Solar Energy

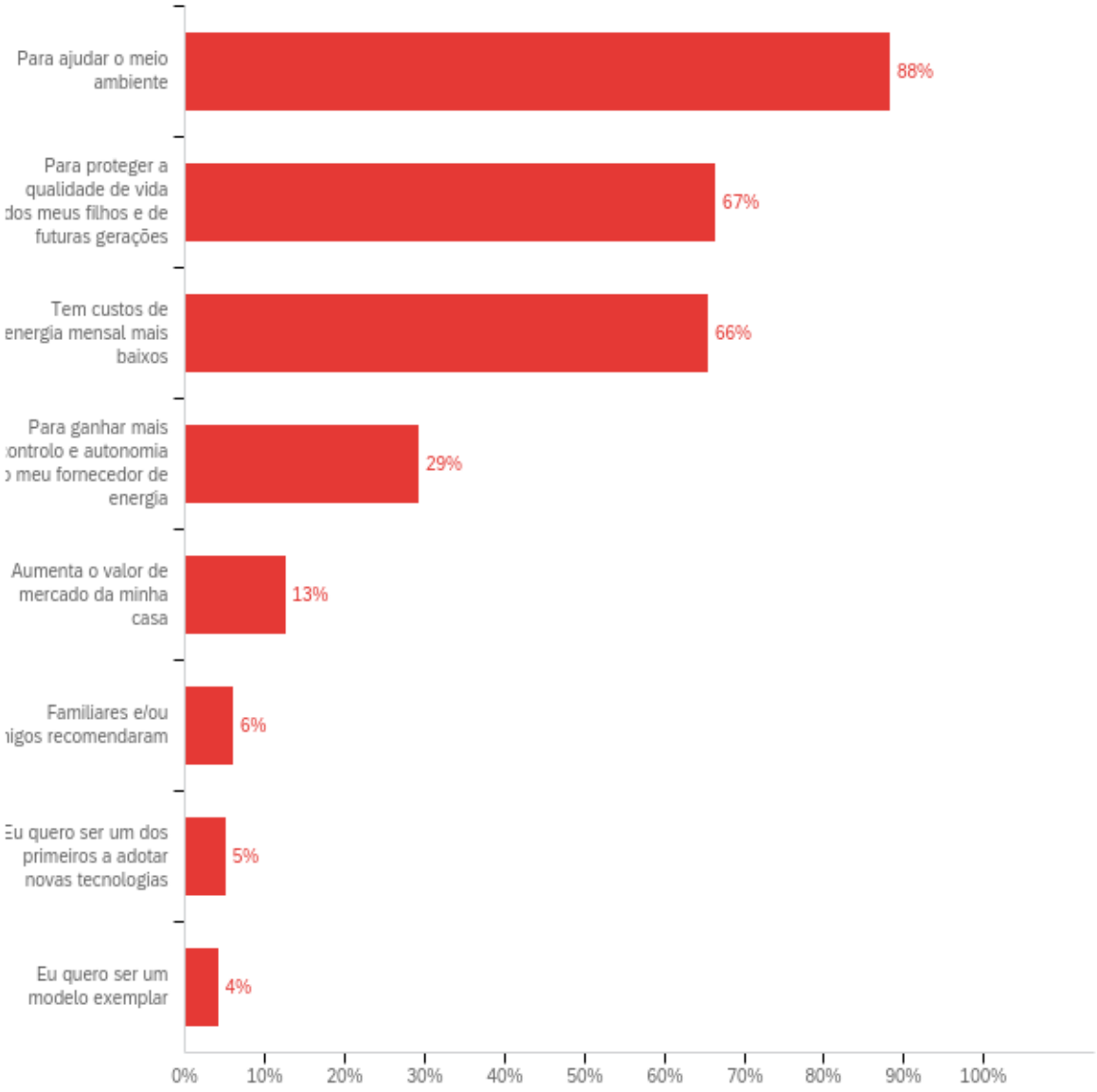


Exhibit 28 – Respondent's reasons for not adopting Solar Energy

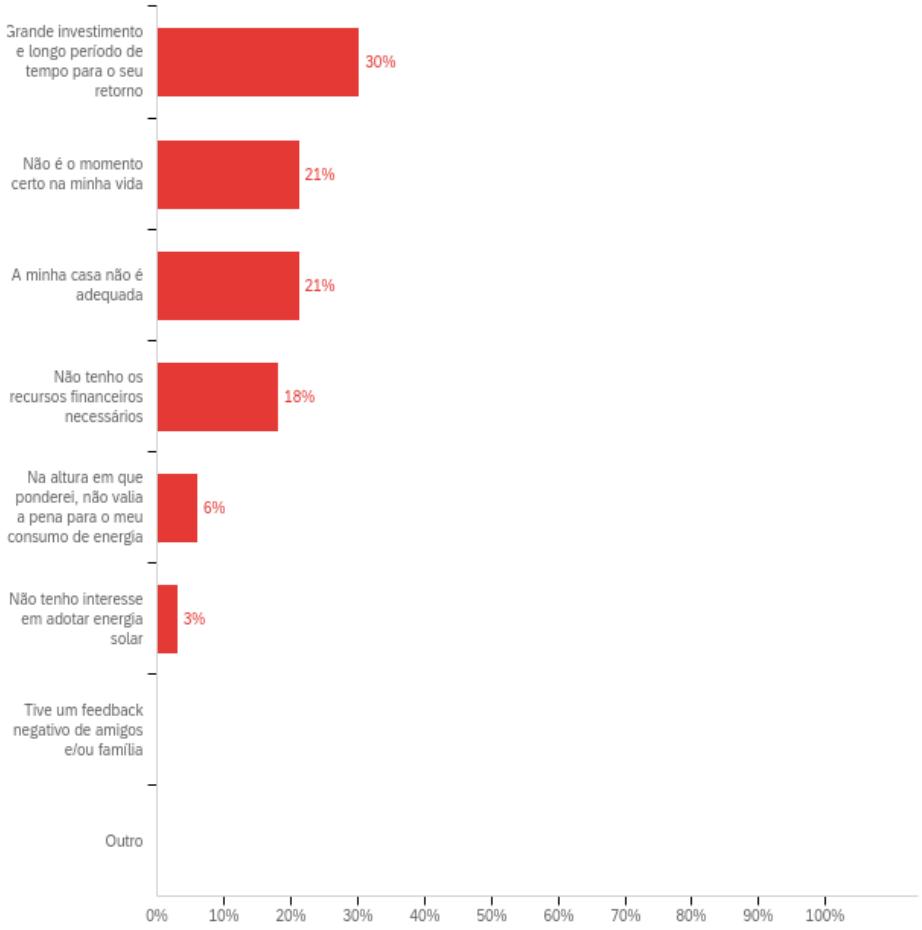


Exhibit 29 – Reasons for not joining a solar community

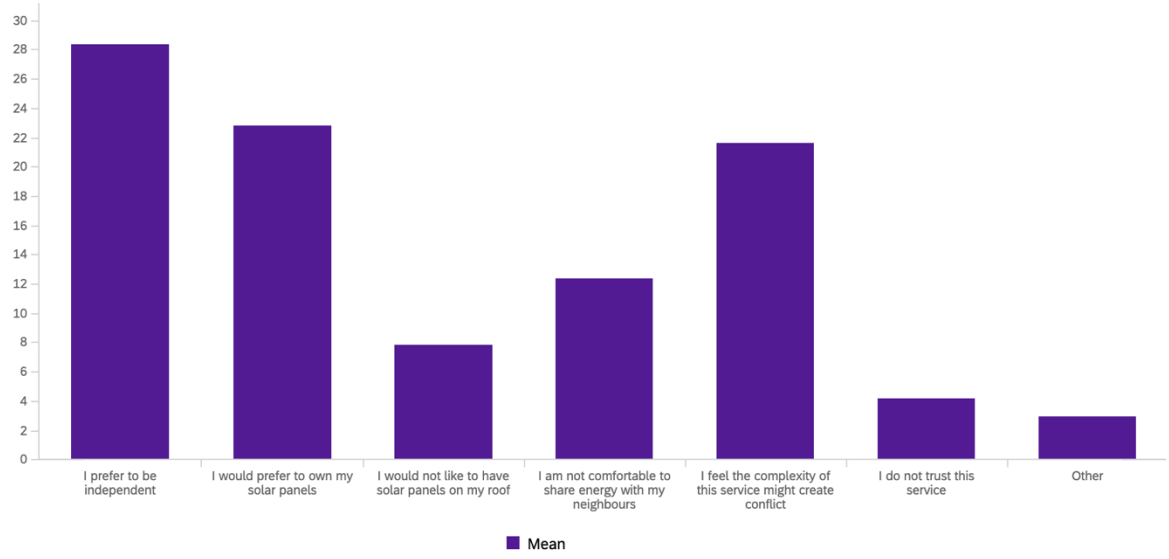


Exhibit 30 – Respondents openness to join a Solar Community

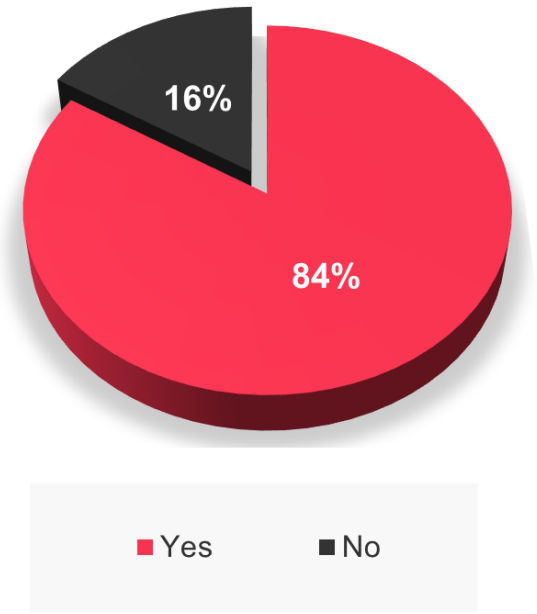


Exhibit 31 – Respondent's role preference within Solar Community

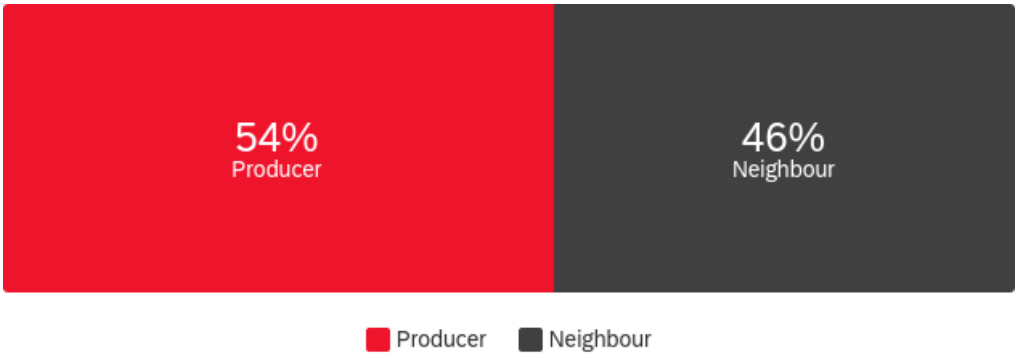


Exhibit 32 – Respondents' willingness to join and monthly bill

Stub: Q15: Estaria interessado em fazer parte de uma Comunidade Solar?

	Q13: Qual é o seu custo médio mensal de energia?						
	Total	€0 - €50	€51 - €100	€101 - €150	€151 - €200	€201 - €250	+ €251
Total Count (Answering)	244,0	34,0	119,0	50,0	20,0	2,0	10,0
Sim	84,0%	82,4%	83,2%	84,0%	90,0%	100,0%	90,0%
Não	16,0%	17,6%	16,8%	16,0%	10,0%	0,0%	10,0%

Exhibit 33 – Concerns about joining a Solar Community

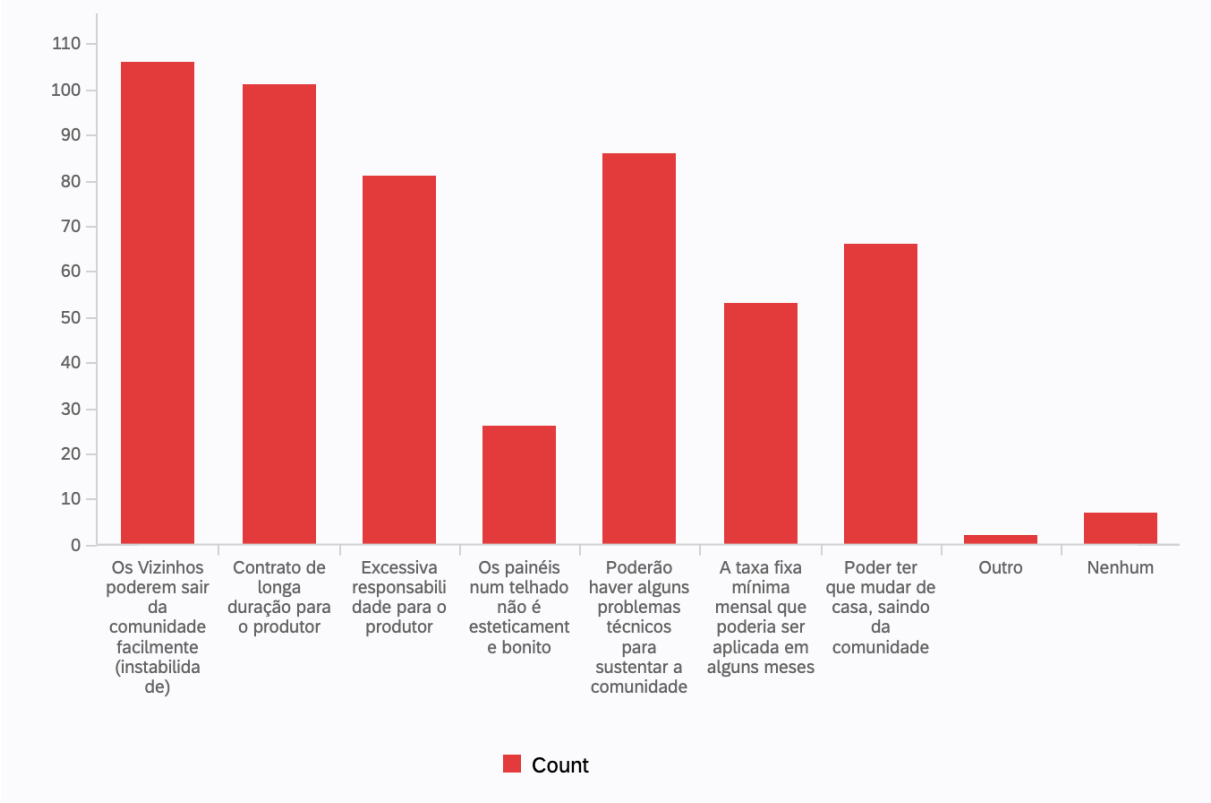


Exhibit 34 – Respondents reaction to MFV

	I'm likely to join even with the fixed charge	*This is a fair charge*
Producers	6.4	5.5
Neighbours	7.2	6.5

Exhibit 35 – Willingness to join with MFV

I'm willing to join even with the fixed charge.
(0= Totally Disagree ; 10=Totally Agree)

	Total
Total Count (Answering)	201,0
0 (Estou disposto a ...a taxa fixa mínima.)	2,0%
1 (Estou disposto a ...a taxa fixa mínima.)	9,5%
2 (Estou disposto a ...a taxa fixa mínima.)	4,0%
3 (Estou disposto a ...a taxa fixa mínima.)	6,0%
4 (Estou disposto a ...a taxa fixa mínima.)	4,0%
5 (Estou disposto a ...a taxa fixa mínima.)	11,4%
6 (Estou disposto a ...a taxa fixa mínima.)	11,9%
7 (Estou disposto a ...a taxa fixa mínima.)	11,9%
8 (Estou disposto a ...a taxa fixa mínima.)	16,9%
9 (Estou disposto a ...a taxa fixa mínima.)	4,5%
10 (Estou disposto a...a taxa fixa mínima.)	17,9%

74,5%

Exhibit 36 – Market Potential

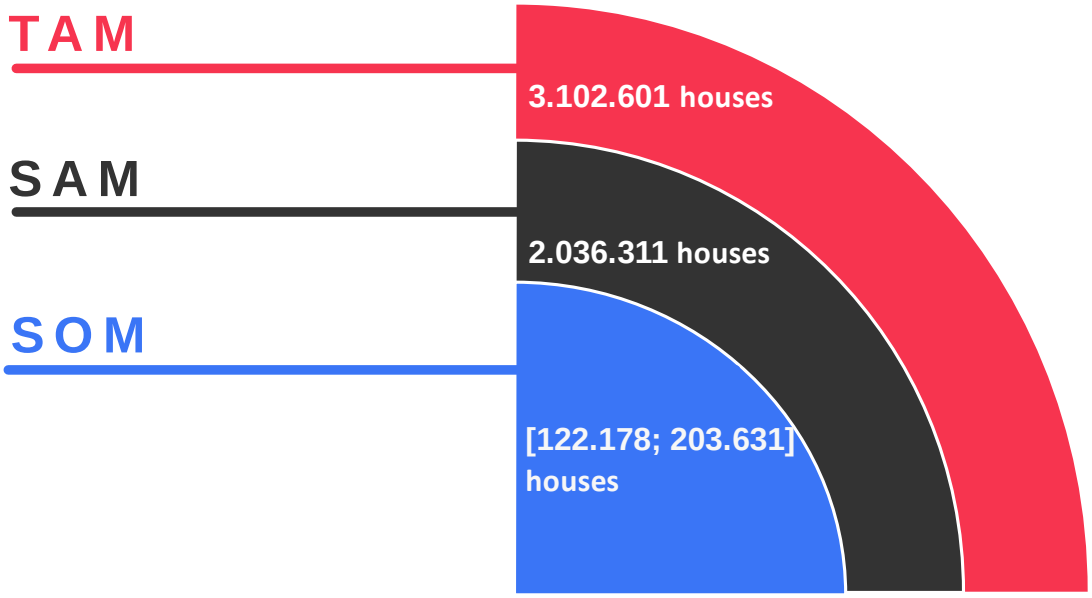


Exhibit 37 – Bairro Solar's brand identity prism

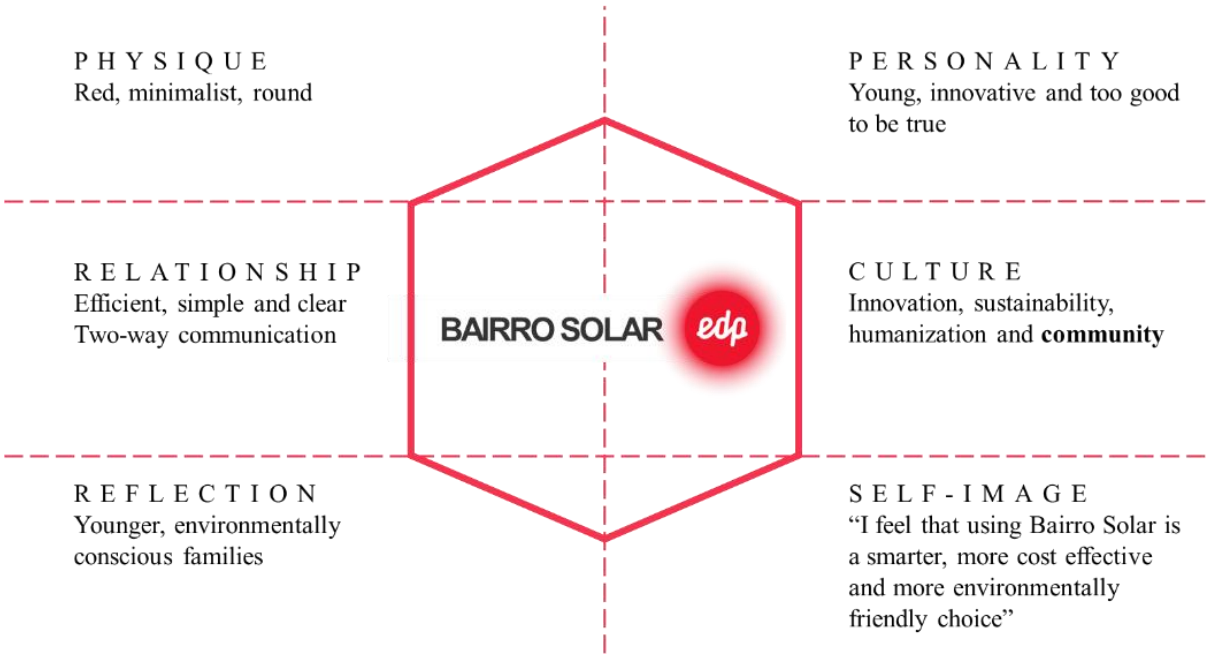


Exhibit 38 – EDP's brand identity prism

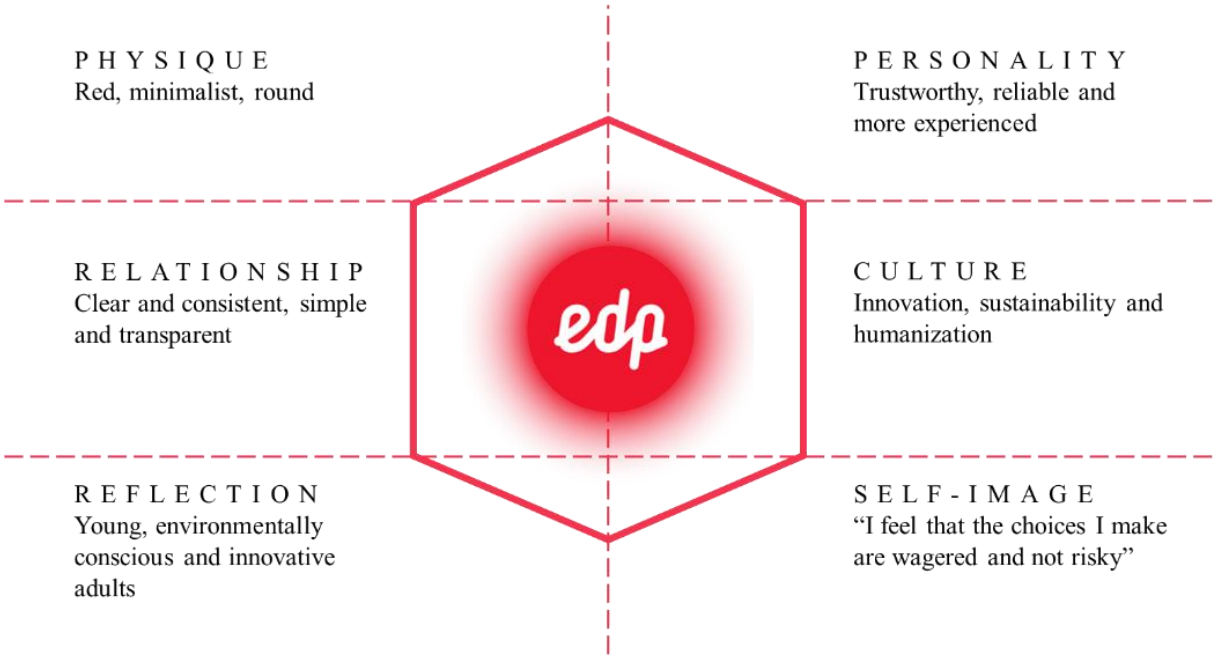
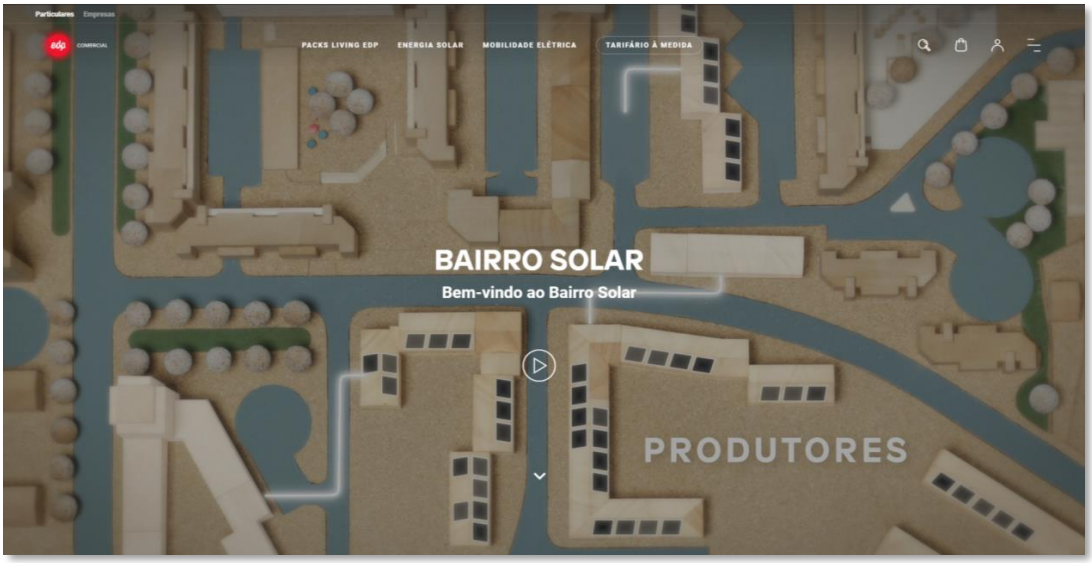
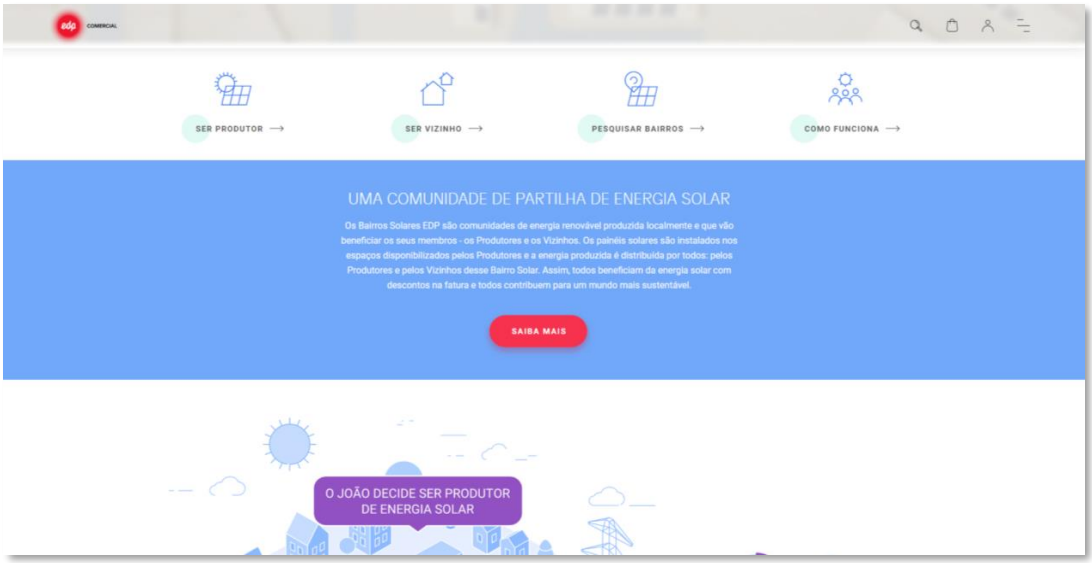


Exhibit 39 – Logo for *Bairro Solar EDP*

Exhibit 40 – Proposed character look and feel

Exhibit 41 – Website Bairro Solar EDP


Particulares Empresas
edp COMERCIAL
PACKS LIVING EDP
ENERGIA SOLAR
MOBILIDADE ELÉTRICA
TARIFÁRIO À MEDIDA
BAIRRO SOLAR
Bem-vindo ao Bairro Solar
PRODUTORES


edp COMERCIAL
SER PRODUTOR
SER VIZINHO
PESQUISAR BAIRROS
COMO FUNCIONA
UMA COMUNIDADE DE PARTILHA DE ENERGIA SOLAR
Os Bairros Solares EDP são comunidades de energia renovável produzida localmente e que vão beneficiar os seus membros - os Produtores e os Vizinhos. Os painéis solares são instalados nos espaços disponibilizados pelos Produtores e a energia produzida é distribuída por todos: pelos Produtores e pelos Vizinhos desse Bairro Solar. Assim, todos beneficiam da energia solar com descontos na fatura e todos contribuem para um mundo mais sustentável.
SAIBA MAIS
O JOÃO DECIDE SER PRODUTOR DE ENERGIA SOLAR


edp COMERCIAL
CONHEÇA AS VANTAGENS
ZERO INVESTIMENTO
Receba energia solar do seu bairro sem investimento.
ENERGIA 100% RENOVÁVEL
Contribua para um mundo mais sustentável com energia solar.
POUPANÇA NA FATURA
Beneficie de um desconto no preço da energia solar que receber do seu bairro.
SENTIDO DE COMUNIDADE
Faça parte de uma rede de partilha de energia sustentável com os seus vizinhos.
PRODUTOR
Tem espaço disponível para instalação de painéis solares? Pode ser um produtor. Basta criar um Bairro Solar para posteriormente os seus Vizinhos poderem aderir. Instalamos os painéis solares no seu espaço, sem qualquer investimento.
Após início da produção, recebe uma parte da energia solar produzida no Bairro. Toda a energia que consumir do Bairro tem um desconto no preço.
CRIAR BAIRRO
SAIBA MAIS
VIZINHO

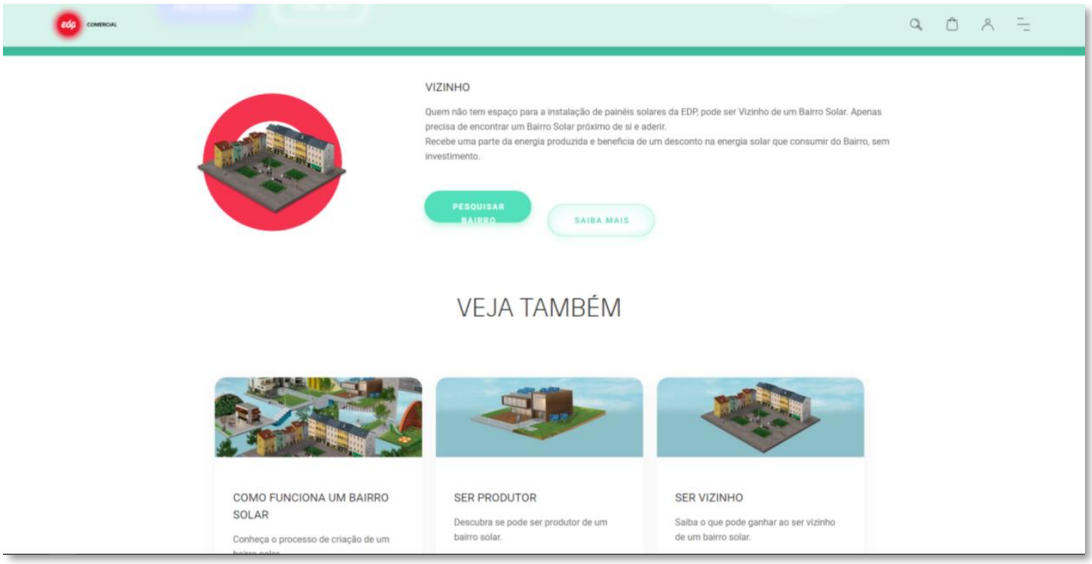


Exhibit 42 – *Bairro Solar EDP* Flowchart

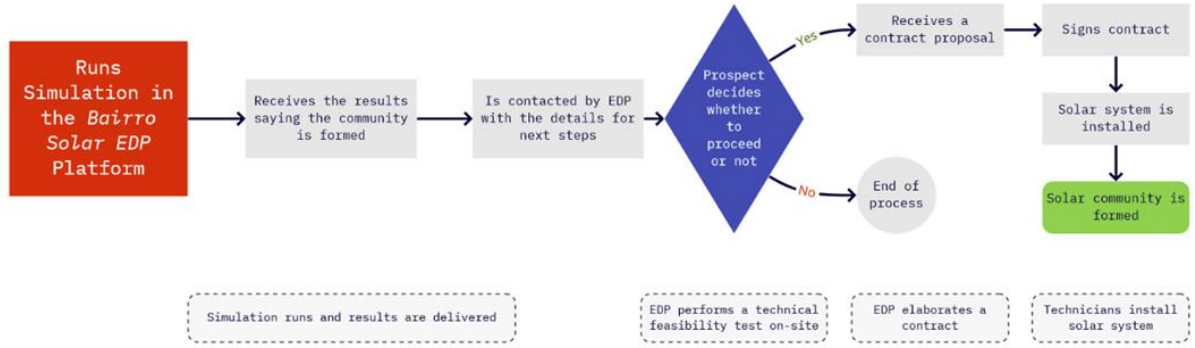


Exhibit 43 – Bairro Solar EDP Blueprint

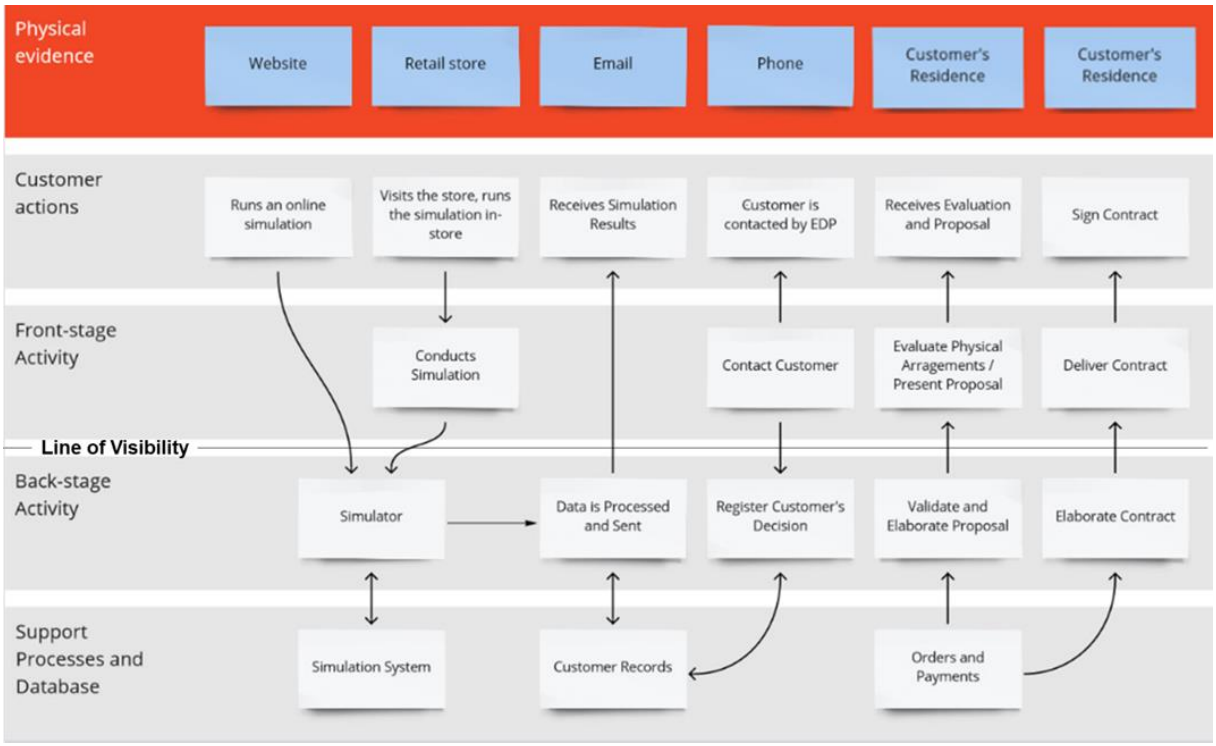


Exhibit 44 – Bairro Solar EDP Blueprint (continuation)

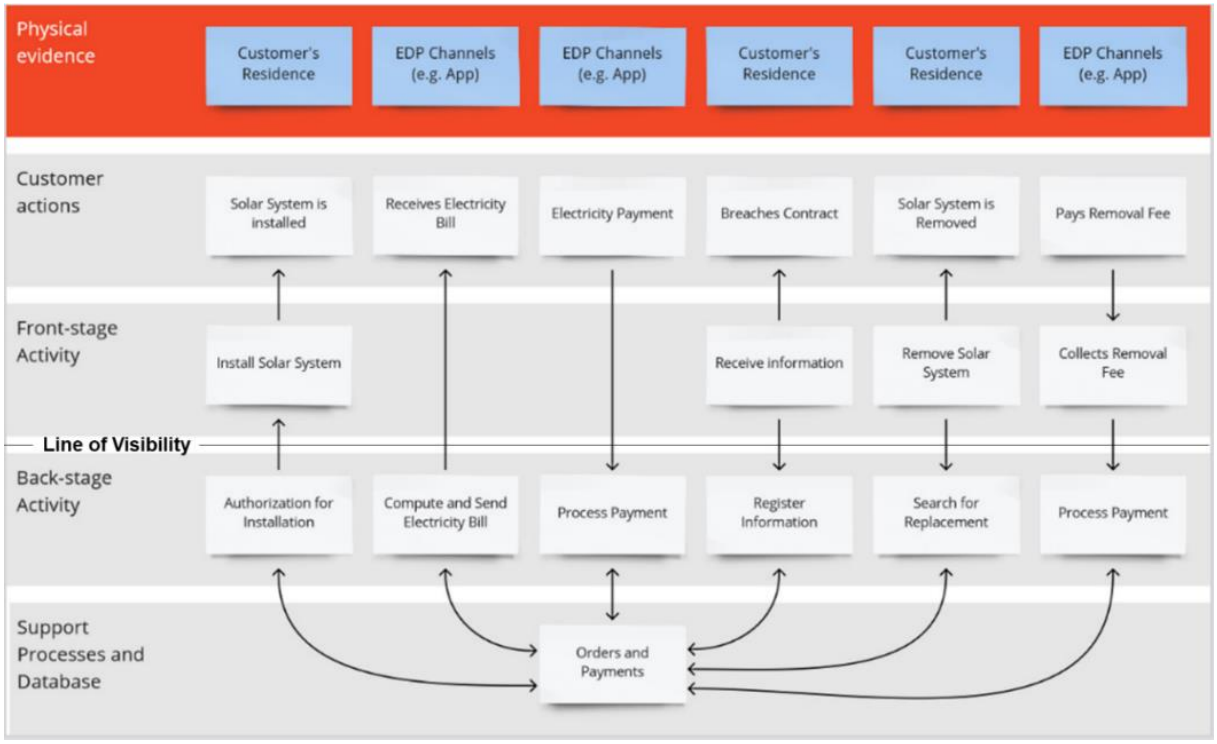

Physical evidence
Customer's Residence
EDP Channels (e.g. App)
EDP Channels (e.g. App)
Customer's Residence
Customer's Residence
EDP Channels (e.g. App)
Customer actions
Solar System is installed
Receives Electricity Bill
Electricity Payment
Breaches Contract
Solar System is Removed
Pays Removal Fee
Front-stage Activity
Install Solar System
Receive information
Remove Solar System
Collects Removal Fee
Line of Visibility
Back-stage Activity
Authorization for Installation
Compute and Send Electricity Bill
Process Payment
Register Information
Search for Replacement
Process Payment
Support Processes and Database
Orders and Payments

Exhibit 45 – Service Outputs Description

Bulk Breaking Adapted from: Robert W. Palmatier et al., Marketing Channel Strategy, 8th Ed. (2015), Pearson Prentice Hall	The end-user's ability to buy a desired (possibly small) number of units, even if the product or service originally was produced in large, batch-production lot sizes. The higher the Bulk Breaking, the smaller the lot size and the higher the channel's service output level.
Spatial Convenience	Increases consumers' satisfaction by reducing transportation requirements and search costs, facilitating the purchase of the product/service.
Waiting and delivery time	Time period that the end-user must wait between ordering and receiving goods or post sale service. Usually, the willingness to wait is directly proportional to price reduction.
Product Variety and Assortment	When the breadth of the variety or the depth of the product assortment available to end-users is greater, so are the outputs of the marketing channel system, but so too are the overall distribution costs.
Customer Service	Refers to all aspects that ease the shopping and purchase process for end-users during their interactions with suppliers or retailers.
Information Provision	Refers to education of end-users about product attributes or usage capabilities, or pre-purchase and post-purchase services

Exhibit 46 – Service Outputs for *Bairro Solar EDP*

Service Outputs (4 out of 6) related to *Bairro Solar EDP*:

Regarding **bulk-breaking**, EDP requests big batches of solar panels and other necessary material to its suppliers to then be stored, this allows the communities to get their desired number of panel units. Within this service, the end-consumer does not crave a desire for more units, in fact it is requested a certain level of accuracy in the appropriate number of panels for an efficient service.

Waiting and delivery time is inconclusive to say how long it will take to set operations and activate a community, since it has never been done**.** For comparison reasons, EDP takes around 3 weeks to set operations when solar energy is auto-consumption. Nevertheless, the demand for a quick delivery might diverse from the original tangible items of a purchase compared to post-purchase service, so it is likely that community members might request for a faster response when fixing some malfunction with the panels then in the installation process.

Product variety and assortment for the *Bairro Solar EDP* is not necessarily relevant, even though EDP offers 2 types of panels for Energia Solar EDP, in this new service only the product line "Quality" will be available.

Exhibit 47 – Question asked for qualitative research purposes

Put on a cross (x) in each of the 3 topics:

		1	2	3	4	
Willingness to go to store	I would rather not have to go to a store and save some time; I would rather do the purchasing process remotely (online or by a call).					I would rather go to the store and know more information as well as do my purchase.
Customer Service	I would rather do my own research and simulation of the service by myself.					I would rather get the opinion of a specialist with the know-how that can explain me the service.
Information	The information in the website and some explanatory videos are enough for me to possibly make a purchase decision.					The more information the better. I will only go through a purchase when I have the maximum information needed.

1 = Agree more with the quote on the left
4 = Agree more with the quote on the right

The **30 people** that were submitted to this question are within the target audience established in the quantitative research, as they were submitted to the same filtering questions and had already done the survey.

Exhibit 48 – Segments drawn from a Cluster Analysis

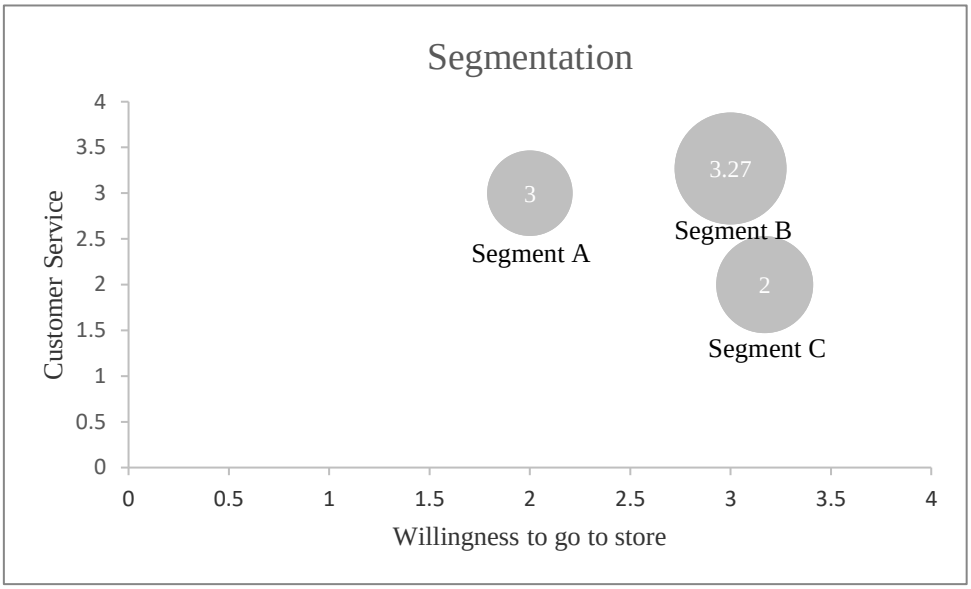


Exhibit 49 – Descriptive Table of each Segment

Segments	Size	Service Outputs			Characteristics
		Willingness to go to store (Spatial Convenience)	Customer Service	Information Provision	
A	20%	Low (Remote)	Moderate High	Low	**Validation-shoppers:** They prefer the "do-it-yourself" approach and value a great deal convenience; Do not require high information to make the purchase but believe a specialised opinion from an employee is the final push needed to cease a purchase.
B	40%	Moderate High	High	High	**Demanding:** They want specialised assistance through out the whole process and require a lot of information about the service. Even though they are willing to let go of some convenience, they are not quite inclined to go in-store.
C	40%	Moderate High	Low	Moderate Low	**Flexible:** They prefer the "do-it-yourself" approach but are more willing to abdicate of a certain level of convenience to know more information.

Low	Difference from below average more than -0,5
Moderate Low	Difference from below average until than -0,5
Moderate High	Difference from above average until 0,5
High	Difference from below average more than 0,5

Note: The preferences were defined based on much each segment differed from the average each service output.

Exhibit 50 – Segments Distribution: Preferences and Channels

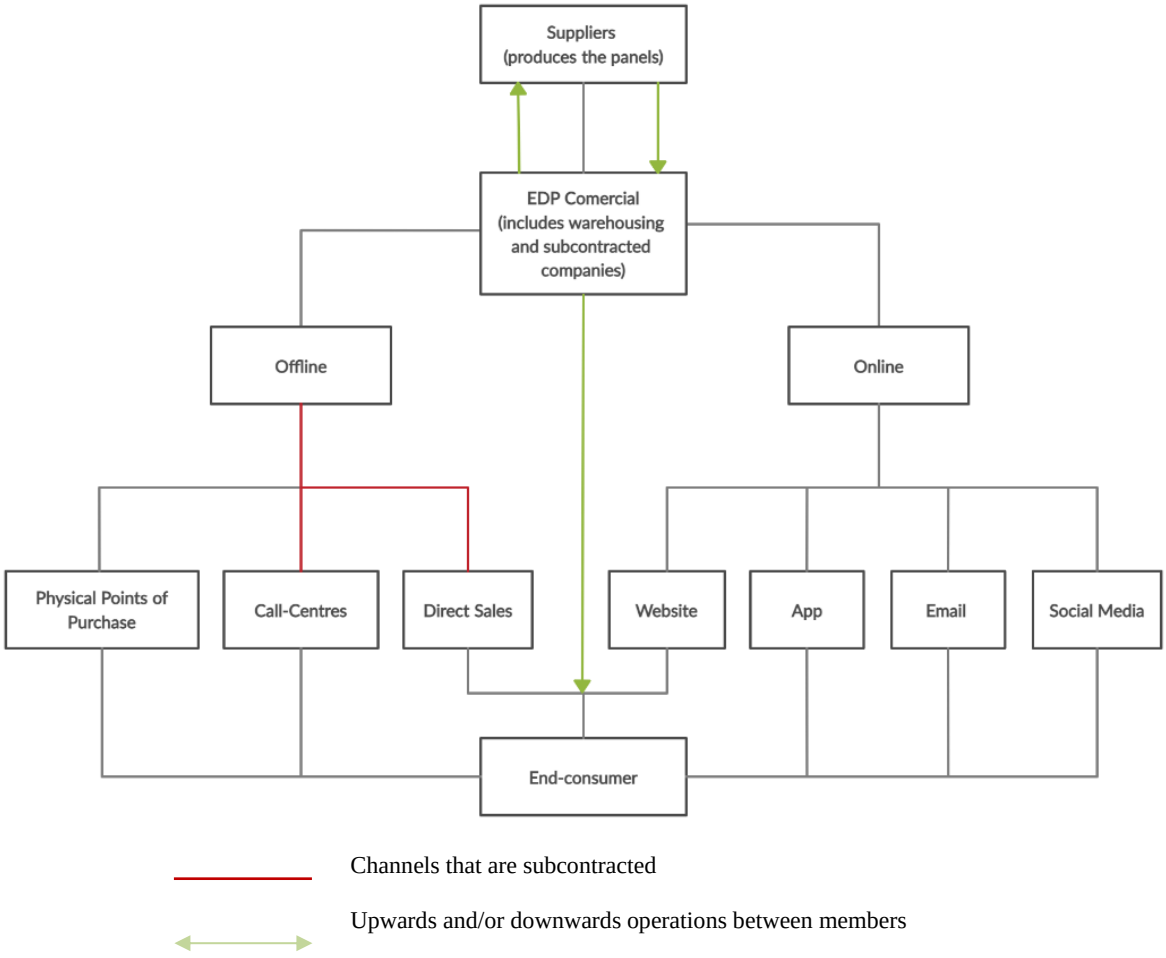
Segments	Size	Service Outputs			Channels
		Willingness to go to store (Spatial Convenience)	Customer Service	Information Provision	
A	20%	Low (Remote)	Moderate High	Low	**Website:** do simulation, gather information **Call-centre:** validates purchase decision, provides customer support
B	40%	Moderate High	High	High	**Door-to-door:** educate on the service, do simulation with client
C	40%	Moderate High	Low	Moderate Low	**Website:** do simulation, gather information **Chatbots** and **email** to provides customer support

Segment A: the validation shopper. The website will be the first touchpoint as it portrays low willingness to go to store, and it will then be followed up with a call from the call-centre to provide specialized input and validate customer purchase decision.

Segment B: the demanding. Demands high customer service and information provision but does not wishes to go to store hence, D2D will be the most appropriate channel.

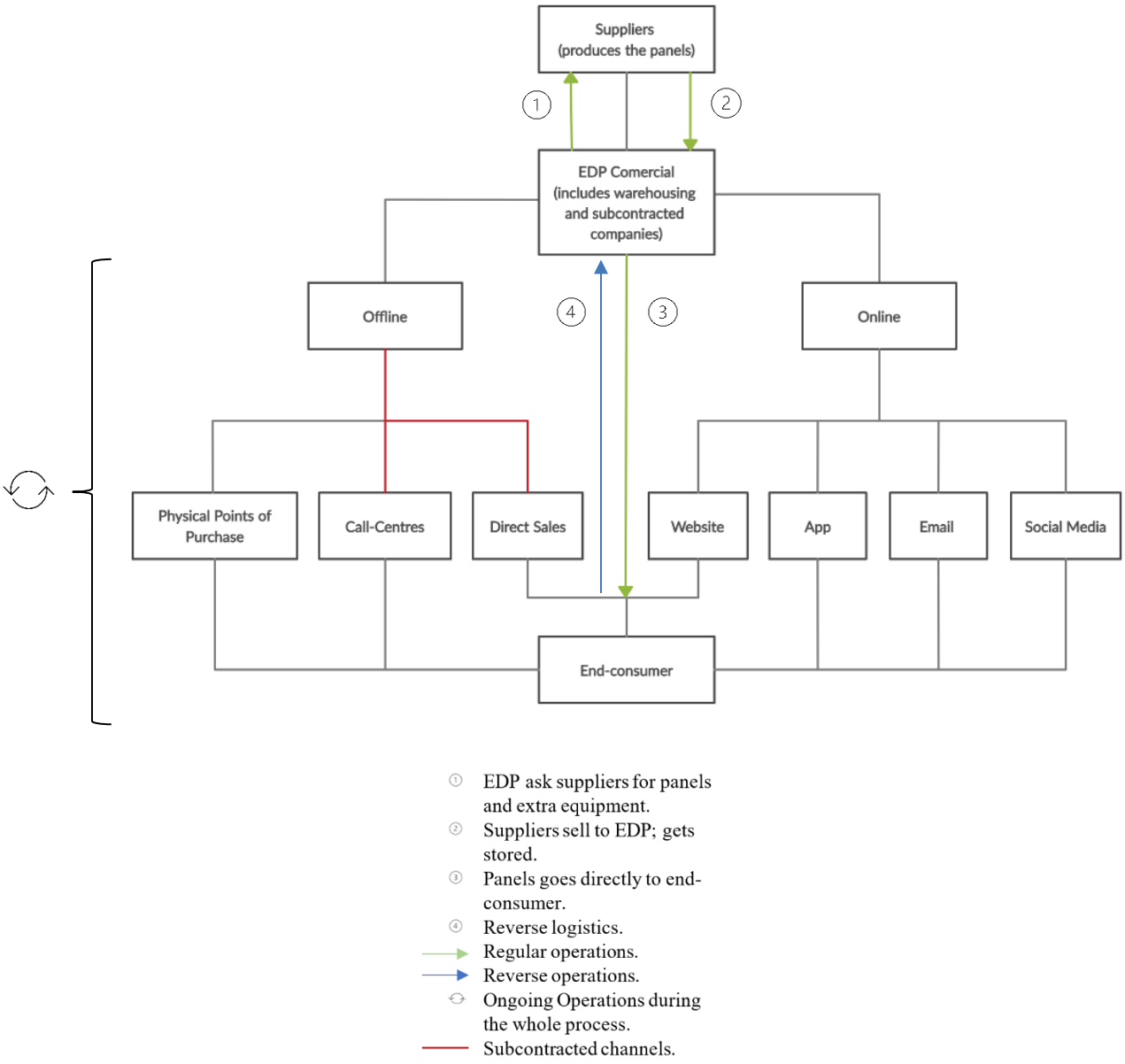
Segment C: the flexible. Wants low involvement from the company in its journey but still needs some information provision, hence online channels were decided the most suitable channels: website, email and chatbots.

Exhibit 51 – Energia Solar EDP Marketing Channel Distribution



Note: Energia Solar EDP is a service from EDP Comercial through which a domestic consumer can buy photovoltaic solar panels, install them on his roof and produce his own electricity, consuming only part of it. Benefiting from a reduction in the electricity bill while consuming clean energy.

Exhibit 52 – Bairro Solar EDP: Channel Distribution, Process and Structure



Note: Points of Purchase include Stores and Agents.

Agents are more common in regions with less client density, EDP has partnerships with other stores that can handle its business. These have different classifications depending if they sell EDP's product to clients - *Agentes de Atendimento* or if they only process bill payments – *Agentes de Venda* or if they do both – *Agentes de Atendimento e Venda*.

Exhibit 53 – Channel Flows of *Bairro Solar EDP*

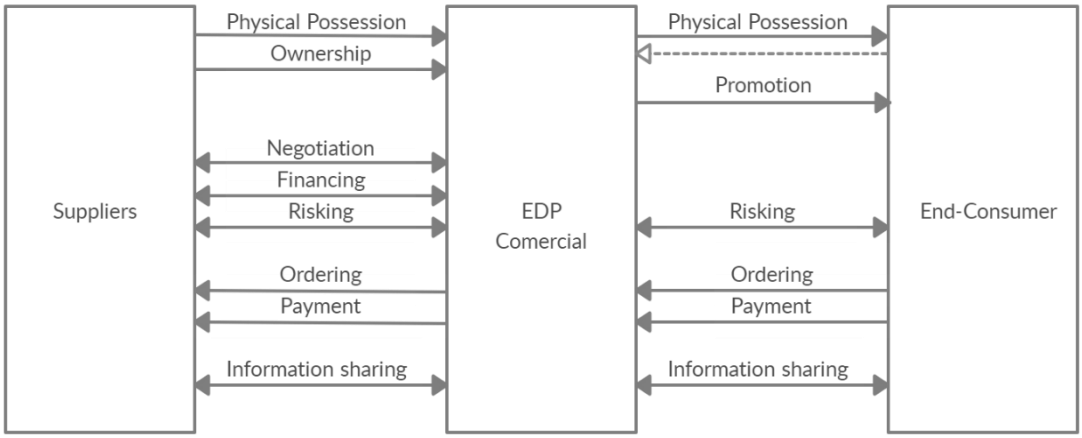


Exhibit 54 – Service Gap Analysis

Segment	Service Outputs				Distribution Channel Type
	Spatial Convinience	Customer Service	Information Provision	Waiting and delivery time	
Validation-shopper A	SOS=SOD	SOS = SOD	SOS = SOD	SOS = SOD	Website
Validation-shopper A	SOS=SOD	SOS = SOD	SOS >SOD	SOS < SOD	Call-centre
Validation-shopper A	SOS > SOD	SOS = SOD	SOS >SOD	SOS < SOD	In-store/ Agents
Demanding B	SOS = SOD	SOS = SOD	SOS = SOD	SOS = SOD	Website
Demanding B	SOS = SOD	SOS = SOD	SOS = SOD	SOS = SOD	D2D
Demanding B	SOS > SOD	SOS = SOD	SOS = SOD	SOS < SOD	In-store/ Agents
Flexible C	SOS = SOD	SOS = SOD	SOS = SOD	SOS = SOD	Website
Flexible C	SOS = SOD	SOS = SOD	SOS = SOD	SOS = SOD	Email/Chatbot
Flexible C	SOS > SOD	SOS > SOD	SOS > SOD	SOS < SOD	In-store/ Agents

Note: Separate table was created for service backup because it does not vary between segments and it is not related to a marketing channel. Service backup is a service output that incurs costs; hence it was considered in both service and costs gaps.

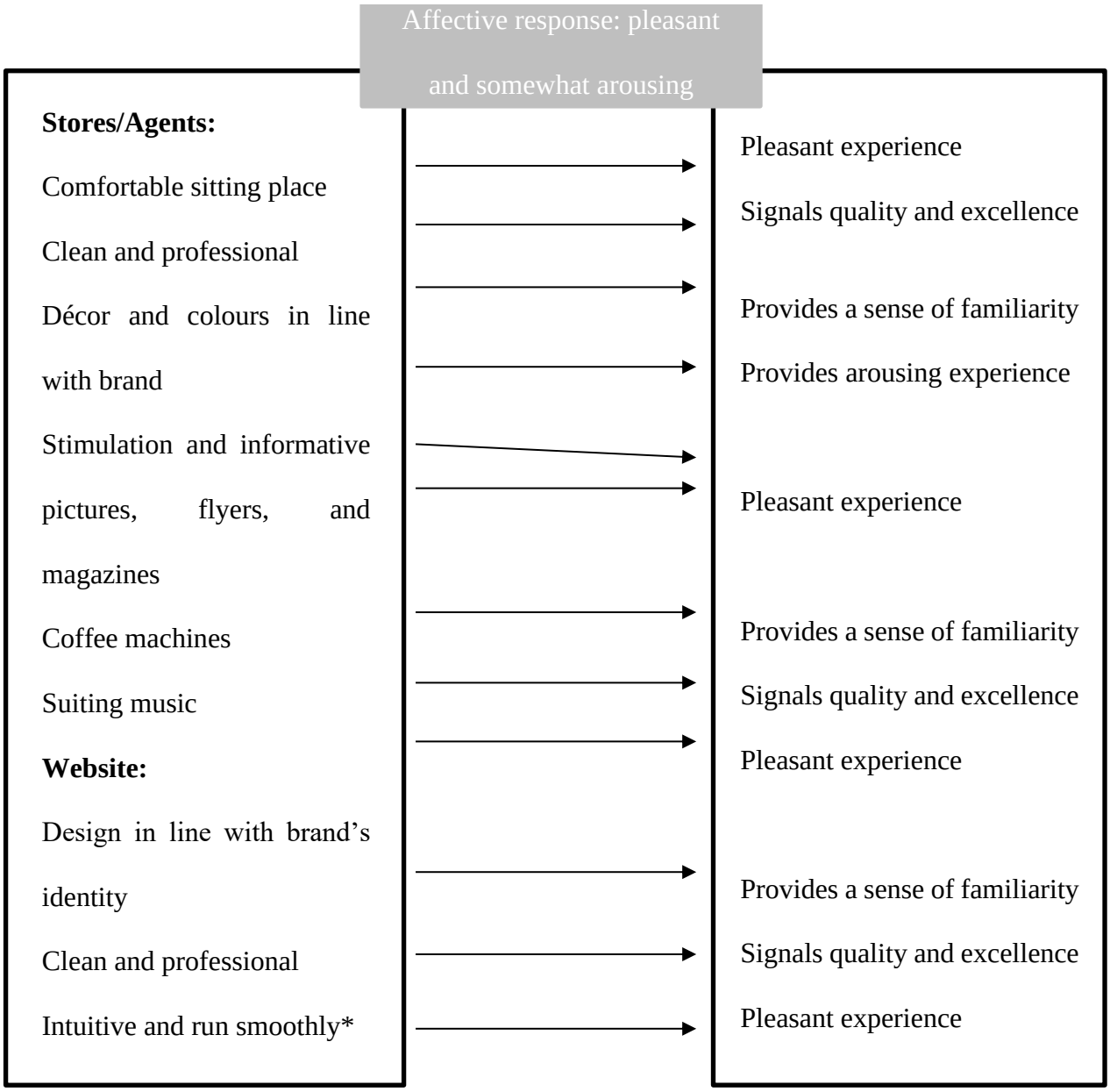
Exhibit 55 – Cost Gap Analysis

Segments	Marketing Channel	Channel Members	Environmental/Managerial bounds	Cost-gap: Flow(s) affected	Planned techniques to close them
A and C	Stores/ Agents and Call-centres	EDP Comercial	Managerial bound	Excessive training costs whereas segments want somewhat low information	Focus training costs more on the channels responsible for high number of sales (D2D) and also deliver the information to the right segments (B) that will aprreciate it
All	All	EDP Comercial	Managerial bound	Training cots for employees that might leave short after (employee turnover)	Do not train new employees
All	————	EDP Comercial	Managerial bound	Maintenance cost will increase (free service, higher number of panels)	It is valued by the end-consumer, so this service add-on cannot be removed. Note: check if other members are being negatively impacted by this
All	————	EDP Comercial	Managerial bound	Transportation costs for panel removal	See if community members are indifferent with the panel removal, if yes do not remove

Exhibit 56 – Tangible Items: Solar Panel

Exhibit 57 – Tangible Items: Inverters

Exhibit 58 – Mehrabian–Russell Stimulus–Response Model



Adapted from: Wirtz, Jochen and Cristopher Lovelock., Service Marketing: People, Technology and Strategy, 8th Ed. (2016), New Jersey: World Scientific Publishing Co. Inc

* Specially the simulation as if something lacks might be enough to discourage the purchase.

* Sales force should try to find the optimal time to visit potential clients, possibly schedule it, so that they do not catch someone in a bad time which will subconsciously undermine the service value delivery.

Exhibit 59 – EDP's Solar Community Alternative

	EDP'S SOLAR COMMUNITY	NEXT BEST ALTERNATIVE
Price	To be determined	€ 9108 for 12 panels* (€ 759 per panel)
Maintenance (including cleaning, reparation, replacement and inspection)	€ 0	≈ € 400
Installation	€ 0	≈ € 1440 (€120 per panel)
	€ 0	€ 10.948 (€2737 per member)

*minimum number of panels to form a community

Data sources:
https://www.leroymerlin.pt/Produtos/Eletricidade-e-domotica/Energias-renovaveis/WPR_REF_81908458

Exhibit 60 – True Economic Value

Note: The expected savings correspond to a period of 15 years and were based on the financial model designed with EDP.

Exhibit 61 – Estimated Prices, Costs and Margins

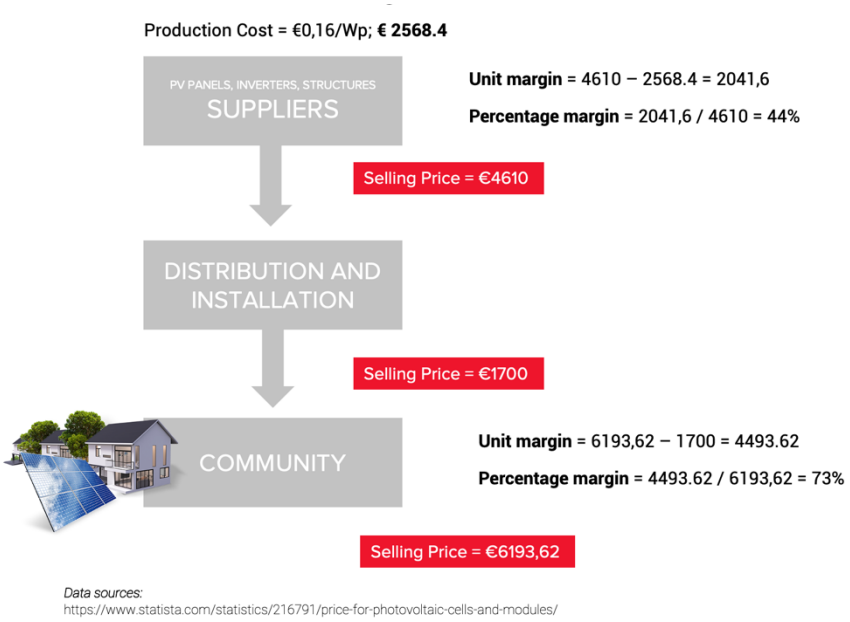


Exhibit 62 – Net Profit Margin

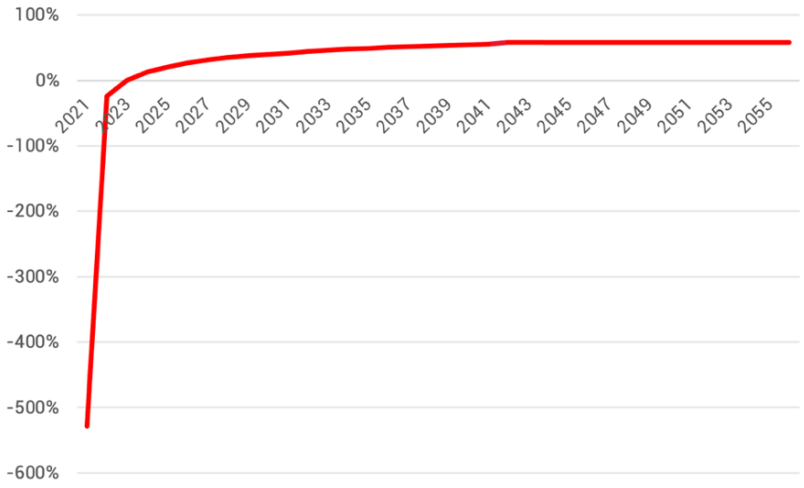


Exhibit 63 – Marketing Objectives: Market Penetration after year 1-5

Market Potential	
Number of Houses x Revenue per house	**17.368.861,70 €**
# houses total	203.631
average revenue per household	85,30 €

Year 1	
# houses after Y1	3.881
# of communities after Y1	715
Revenue Y1	**371.289,89 €**
Market Penetration Y1	**1,9%**

Year 2	
# houses after Y2	8.925
# of communities after Y2	1.645
Revenue Y2	**845.472,42 €**
Market Penetration Y2	**4,4%**

Year 3	
# houses after Y3	14.726
# of communities after Y3	2.713
Revenue Y3	**1.384.855,07 €**
Market Penetration Y3	**7,2%**

Year 4	
# houses after Y4	21.282
# of communities after Y4	3.921
Revenue Y4	**1.995.294,77 €**
Market Penetration Y4	**10,5%**

Year 5	
# houses after Y5	28.428
# of communities after Y5	5.238
Revenue Y5	**2.656.827,40 €**
Market Penetration Y5	**14,0%**

Exhibit 64 – Quantitative research results: Age groups considering being part of Solar Community

		Q15: Estaria interessado em fazer parte de uma Comunidade Solar?		
		Total	Sim	Não
	Total	201,0	168,0	33,0
Q23: Quantos anos tem?	[18 - 25[	20,0	17,0	3,0
	[25 - 35[	22,0	19,0	3,0
	[36 - 45[	32,0	**27,0**	5,0
	[46 - 55[	66,0	**55,0**	11,0
	[56 - 65[	55,0	**45,0**	10,0
	[66 - 75[	1,0	1,0	0,0
	Mais de 75	1,0	1,0	0,0
	Prefiro não dizer	4,0	3,0	1,0

Exhibit 65 – Behavioural Sequence Model for *Bairro Solar EDP*

	Decision stages				
	Need arousal	Evaluation	Decision	Purchase	Usage
Who	Household member Family, Friends, Neighbours (initiator/influencer); Electricity experts, Sales person (influencer); Utility provider (influencer)	Household member (initiator) Family, Friends, Neighbours (initiator/influencer); Electricity experts/ Sales person (influencer); Utility provider (influencer)	Household (decider)	Household (purchaser)	Household (users)
Where	Own home; Other's home; Online, phone call	Home; Store	Home	Home; Store	Home
When	During reception or payment of energy bill (end of During discussions with influencers	Right after need arousal	Approx. 1 month after information search and evaluation	Right after brand consideration	After installation, and then for duration of contract
How	Awareness of high cost of electricity bill; Check on other's referrals; Advertisement	Research online and offline (Store); Q&A in Store	Simulation on Website; Reliability and feasibility; Life stage and situation consideration	Reaching out to electricity supplier (online or offline)	While using electricity

Exhibit 66 – Summary of communication objectives for *Bairro Solar EDP* Marketing Campaign

Communication effect	Communication objective options
Category Need	*Sell* for unaware NCU's, *Remind* for positive NCU's
Brand Awareness	*Brand Recall,* choice made prior to purchase
Brand Attitude	*Create* for Brand and Category
Brand Purchase Intention	*Generate* for high involvement purchase
Brand Purchase Facilitation	*Incorporate* in campaign

Exhibit 67 – Creative Brief for *Bairro Solar EDP*

1. **Consumer perspective**
   - See Behavioural Sequence Model in Exhibit 65

Market insights: Inaccessibility of solar energy for private households (including high upfront investment and complex instalment process); customers want to save on electricity bill

Customer insights: "Yes I have considered adapting solar energy, but very briefly. I noticed that it took a long time getting my money back, and I just managed to buy a house, so I guess it's too much for me right now." (Interview response from qualitative research)

Source of Business: NCU's of Solar Communities

Target Market: Families living in a villa that are financially stable to sign a contract and pay monthly bills in order to become part of a solar community and to save on their electricity bill

Creative Target: Household member (Decider), Generation Z (Influencer)

Media: Primary Media – TV, Internet (Website, Social Media, Web Banner Ads), OOH

Secondary Media – Newspaper

2. **Marketing objectives & Action objectives**

Marketing Objectives: Reach market penetration of 1.9% after first year of launch; raise awareness and successfully position *Bairro Solar EDP* in the market

Action Objectives: Pre-Purchase: Run simulation on website

Purchase: Generate purchase of Category and Brand

Post-Purchase: Recommendation to peers, family, friends

3. Communication Objectives

Category Need:	Sell
Brand Awareness:	Brand Recall
Brand Attitude:	Create (for Brand and Category)
Brand Purchase Intention:	Generate
Brand Purchase Facilitation:	Incorporate

4. Positioning statement for campaign

To families in the age of 35-65, living in villas seeking for alternate ways to reduce their electricity bill (NCU‘s), ***Bairro Solar EDP*** is the centrally positioned brand of Shared Solar Energy Solutions (Service-as-hero) **that offers** monthly savings without upfront investment (Incomplete Satisfaction) while at the same time providing a sense of belonging to a community that is contributing to a sustainable environment (Social Approval) **because** EDP, with 40 years of experience, is the leading energy supplier in Portugal and the first company to offer a shared solar energy solution for private households.

Key benefit: solves a problem by enabling customers to save money through easy access to solar energy while at the same time being part of a community

Entry-ticket benefits: effortless instalment process and transparency about energy and cost savings

Tradeoff or omit: price and technical aspects or requirements of the service

5. **Desired consumer response**
    1. Understand benefits of Category and Brand *Bairro Solar EDP*
    2. Run simulation on website
    3. Purchase product (i.e. sign contract)

6. **Mandatory content**
    - Main component should be brief explanation of community concept, making the new service understandable for everyone; create emotions that target audience can relate to
    - Brand logo; Sound; Slogan
    - Call to action: to visit website for simulation and purchase
    - Brand identity: ads must follow EDP Comercial's brand guidelines

Exhibit 68 – Storyboard and sequence of TV ad

Exhibit 69 – Social Media Ads *Bairro Solar EDP*

Exhibit 70 – Outdoor Ads *Bairro Solar EDP*

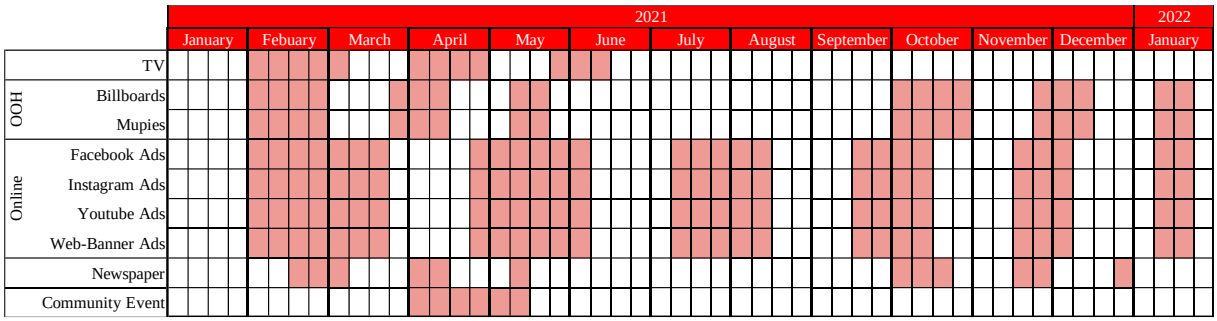
Exhibit 71 – Newspaper article *Bairro Solar EDP*

Exhibit 72 – Campaign Budget

	Cost	Budget allocation
Total campaign budget	900.000,00 €	100%
Cost of production	135.000,00 €	15%
Total Adspend	765.000,00 €	85%

TV	504.900,00 €	66%
OOH	191.250,00 €	25%
Online	22.950,00 €	3%
Social Media Ads	9.180,00 €	40%
Website	2.295,00 €	10%
Web-Banner Ads	11.475,00 €	50%
Newspaper	15.300,00 €	2%
Community Event	7.650,00 €	1%
Competition (Promotion)	22.950,00 €	3%
Total Adspend	**765.000,00 €**	**100%**

Exhibit 73 – Campaign Schedule for *Bairro Solar EDP*



Recall: Reach pattern - Wedge

The campaign will be implemented after the launch of Bairro Solar EDP in February 2021, so that there is still time in January to produce the content

TV: Since TV is the most expensive media and the goal here is to raise awareness, start with TV ads for 5 months in the beginning of the year, including declining frequency until mid June
OOH: Start in the beginning in order to raise awareness and exposure, declining frequency until end of May; 2nd campaign starting in October, to remind and capture those that did not take action during the first campaign, capture the ones that consider solar energy after summer
Online: Start with 7-week slot, include a decrease in frequency over the year. Since it is cost efficient, it makes sense to include it over the whole year. It helps to increase brand recall through high frequency.
Newspaper: 3 slots in the beginning (Feb-May) to educate people on the new service and to go beyond the 3-months competition so that people that read about the community event in the press still have the chance to learn more about it in the newspaper. There will be a second campaign in summer (starting at the same time like OOH and Online), to remind and educate people again.

Exhibit 74 – P&L for the expected scenario for 15 years (units in thousands of euros)

Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Revenues																
Energy Sold	365	838	1,376	1,985	2,646	3,346	4,078	4,819	5,562	6,311	7,060	7,774	8,437	9,038	9,568	10,036
New EDP Customer Margin	6	8	9	10	11	11	12	12	12	13	13	12	11	11	9	9
Operational Costs																
Salesforce	122	158	182	205	224	239	251	256	259	262	264	254	238	219	197	178
Cost of service	4	5	6	7	7	8	8	8	8	8	8	8	8	7	6	6
Marketing Costs																
Total Adspend	765	383	250	250	250	250	250	250	250	250	250	250	250	250	250	250
Cost of Production	135	68	34		34		34		34		34		34		34	
EBITDA	-654	232	914	1,533	2,142	2,860	3,547	4,317	5,024	5,803	6,516	7,275	7,919	8,573	9,090	9,611
Depreciation	98	224	370	535	715	907	1,109	1,315	1,523	1,733	1,945	2,149	2,341	2,517	2,675	2,818
EBIT	-752	8	543	998	1,427	1,953	2,437	3,002	3,501	4,070	4,571	5,125	5,578	6,056	6,415	6,793
EBT	-752	8	543	998	1,427	1,953	2,437	3,002	3,501	4,070	4,571	5,125	5,578	6,056	6,415	6,793
Taxes	-173	2	125	230	328	449	561	690	805	936	1,051	1,179	1,283	1,393	1,475	1,562
Net Income	-579	6	418	769	1,099	1,504	1,877	2,311	2,695	3,134	3,520	3,947	4,295	4,663	4,939	5,231
Cash-Flows																
Taxes CF	173	-2	-125	-230	-328	-449	-561	-690	-805	-936	-1,051	-1,179	-1,283	-1,393	-1,475	-1,562
Investment CF	-2,440	-3,172	-3,648	-4,122	-4,493	-4,808	-5,048	-5,149	-5,200	-5,252	-5,305	-5,093	-4,787	-4,404	-3,964	-3,567
Operational CF	-654	232	914	1,533	2,142	2,860	3,547	4,317	5,024	5,803	6,516	7,275	7,919	8,573	9,090	9,611
FCF	-2,921	-2,941	-2,859	-2,818	-2,679	-2,397	-2,062	-1,523	-982	-385	160	1,003	1,849	2,776	3,651	4,482
Discounted FCF	-2,921	-2,775	-2,545	-2,366	-2,122	-1,791	-1,454	-1,013	-616	-228	89	528	919	1,301	1,615	1,870

Exhibit 75 – Overview of inputs for the P&L

Inputs	
Panel's Efficiency (%)	0.70%
Panel's Production (kWh/kWp/year)	1400
Panel's Peak Production (kWp)	0.3
Solar discount Tariff (producer) (€/kWh)	€ 0.06
Solar discount Tariff (neigbour) (€/kWh)	€ 0.04
Selling to the Market Tariff (€/kWh)	€ 0.05
WACC	6%
Cost (€/kWp)	€ 750
VAT	23%
% New EDP Customers	10%
Yearly Margin Per New EDP Customers	€ 15
Sales force Neighbor	€ 10
Sales force Producer	€ 100
Administrative costs (per year)	€ 1
Duration	15

Exhibit 76 – P&L different scenarios comparison

	Pessimistic	Expected	Optimistic
IRR	7.20%	7.62%	8.10%
IRR/WACC	1.21	1.27	1.35
NPV	€ 2,572,956.51	€ 4,285,488.86	€ 8,852,241.80

Exhibit 77 – Contingency Plan Risks

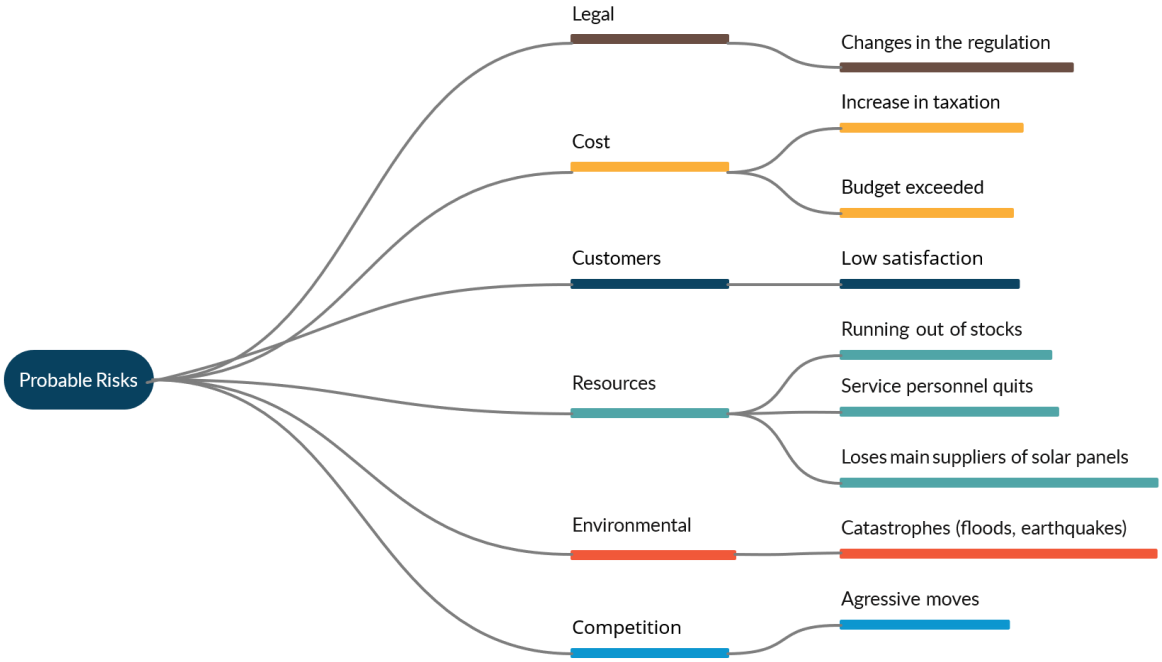
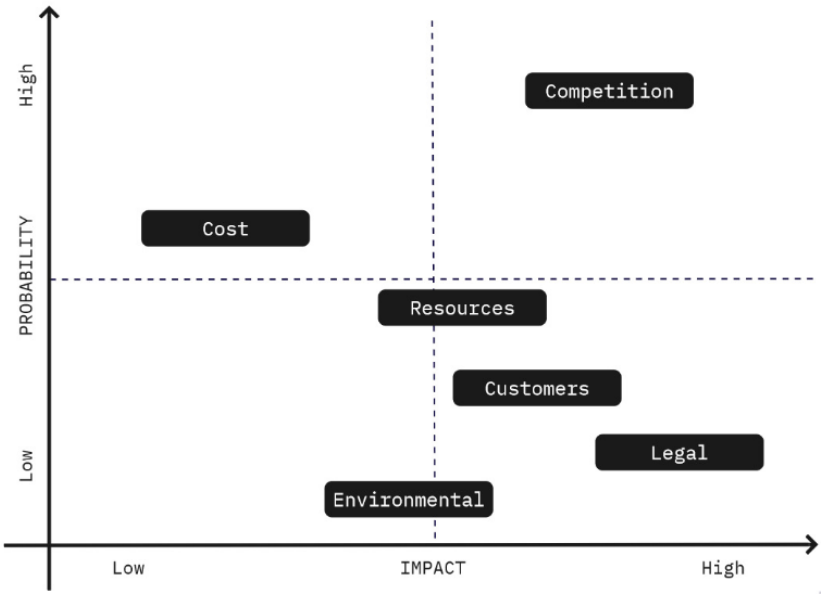


Exhibit 78 – Risk Probability and Impact Matrix



A Work Project presented as part of the requirements for the award of a master's degree in Management from the Nova School of Business and Economics.

POWERED BY MY OWN ENERGY

YOUR SOLAR ENERGY FOR THE NEIGHBOURHOOD

BRAND IDENTITY AND SERVICE

João Filipe Carvalho | 40914

Work project carried out under the supervision of:

Professor Jorge Veloso

JANUARY 2021

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16 Bairro solar EDP

This report has the purpose of further explaining and analysing the literature behind the creation and inclusion of a new service into a brand's portfolio. Furthermore, a look into the Bairro Solar EDP's future is proposed in the concluding part of this report. It is imperative to talk about brand equity as the addition of a new service has direct impact on the latter. The definition, according to (Kotler and Keller 2012), is the "added value endowed on products and services". In this report, the creation of brand identity will be based around the customer; the marketing strategy will be based around the consumer's response. Therefore, and to build a positive customer-based brand equity, its vital for the choice of brand name, logo or symbol and any other relevant brand identities to be done correctly. The elements created below are designed according to the EDP's brand book; besides following these specific guidelines, (Kotler and Keller 2012) also propose a few guidelines to appropriately choose the best brand elements. These are whether the element is memorable, if it is meaningful and likeable – how aesthetically pleasing it is. Moreover, and to help leverage and preserve brand equity for the future, the elements must also be transferable – does it allow for the introduction of new products or services –, adaptable and protectable – is it considered intellectual property.

16.1 Brand elements

16.1.1 Logo

The logo (Exhibit 79) will follow the specific guidelines of EDP's brand book. It was created in line following the several iterations of the current EDP logo. The minimalist style is in line with what the brand has been doing lately. It also connects with the reflected brand identity, seen below, as it relates to the more modern and younger audience.

16.1.2 Slogan

The slogan proposed for this service is "Energia solar para todos" (Solar energy for all). This slogan covers the sense of community by including anyone and everyone plus it also reminds

people of renewable energy. It is also future proof as it is applicable to anything else other than villas – the focus within this report.

16.1.3 Character

A character was created specifically for this brand. To better understand this concept, one could recall the advertisement from Ferrero Rocher where the lady asks that she needs something and then is provided with the Ferrero Rocher. The image of the butler and the lady, these two characters, is what is intended to be replicated into Bairro Solar's brand. A character by the name of Luís (Exhibit 80) will be built and may be characterised as the most average person possible; the only matter that is special about him is that he shares energy. Moreover, Luís is intended to be the identifiable icon of solar communities, thus this character will be replicated into the several media outlets.

16.1.4 Micro website

The website (Exhibit 81) for the brand already exists and will be used not only as an informative and educational tool for Bairro Solar EDP, but also to virtually create communities. As a high involvement purchase and a whole new service to the Portuguese market, it is extremely important to educate prospective consumers on how the process works and what it takes to become a producer or a neighbour.

17 Brand identity

According to Jean-Noël Kapferer, the purpose of brand identity is "to specify the brand's meaning, aim and self-image". Many brands are already capable of developing some sort of visual identity, usually in the form of a brand book or an identity charter. These describe how the brand behaves in a visual format – its colours, graphic design, etc. However, most brands lack the most basic analysis of its identity and it can be quite restricting to do so; without a clear understanding of what the brand means, it might cause it to use a certain graphic style that might

not be adequate. As Kapferer puts it, “brand identity defines what must stay and what is free to change” (Kapferer 2012).

It is important to distinguish between brand image and identity as these two are often misinterpreted. Whilst identity is on the sender’s side, image is the result and interpretation of said identity. Moreover, brand image tends to be the result from “decoding a message, extracting meaning [and] interpreting signs”. These signs, and as demonstrated in Exhibit 82, can be linked to extraneous sources or to brand identity. However, these other sources of inspiration are not sustainable for the brand. First, there are companies that focus on their competitors and choose to copy them and their communication strategy. Secondly, companies prioritize pleasing and satisfying the customer which makes the brand seem opportunistic and trying to be in high favour to its customers. And thirdly, the brand poorly depicts what the customer portrays it as which results in a disconnected communication strategy.

To represent and better describe EDP’s identity, the brand identity prism was used (Exhibit 83). The prism is divided into six facets which are physique, relationship, reflection, personality, culture and self-image and should be represented by a hexagon. The prism also includes both a horizontal and a vertical division. The image or representation it depicts to the outside world, “its outward expression”, is represented by the left side of the hexagon or the physique, relationship and reflection. On the other hand, it has the facets on the right side that are intrinsic to the brand. A picture of the sender and the recipient are defined by the upward and downward facets of the prism, respectively. The ones in the middle help make it easier to convey messages between the two, the sender and the recipient. Below a description of how EDP’s (Exhibit 84) and Bairro Solar EDP’s brand identity (Exhibit 85) might look like.

17.1 EDP's brand identity

17.1.1 Physique

EDP's brand most tangible feature and one of the ones that adds the most value is the use of the colour red. In the simplest form of the physique facet – the logo – EDP uses this colour and it is also most prominent in their usual communication strategies.

17.1.2 Personality

For the consumer, EDP is seen as a trustworthy and reliable brand. If it were a person that would be the exact description of him/her as someone you can trust and find very consistent, who makes choices in a much more wagered and less risky approach.

17.1.3 Culture

More and more brands most foster an ideal; they "must address (...) [the] new demand for meaningfulness". EDP's values of humanization and sustainability aim to create an ideology and a community where employees, customers and partners are the emphasis, and it aims to improve the quality of life of generations to be. Innovation is also very present at EDP with the aim of creating value on all the areas in which it operates. Another fact that proves EDP's efforts of building this community is that for the 13th year in a row, it was recognised by the Dow Jones Sustainability Index (Exhibit 86) as the second most sustainable utility company in the world.

17.1.4 Relationship

"Service is by definition a relationship. [It] defines the mode of conduct that most identifies with the brand" (Kapferer 2012). EDP has built a relationship with its consumers based on trust to deliver a consistent, simple and clear message; this allows it to often anticipate clients' needs (EDP 2018).

17.1.5 Reflection

It is important to mention that the reflected customer is not the target. Whilst the latter describes who the potential users and buyers might be, the former is the result of what he/she wishes to

be seen as a result of using the brand. EDP's reflected customers are mostly young adults, who care about the environment and are quite innovative.

17.1.6 Self-image

Self-image symbolizes how the target will feel when using EDP. The brand offers a security that is related to the fact that, for the longest time, it was the only utility brand available in Portugal. This allowed it to create a sense of trust that the brand will, in a consistent manner, provide power and will offer it in a sustainable way.

17.2 Bairro Solar EDP's brand identity

Managing brand equity is dependent on how consumers will respond to the brand's marketing strategy. It is, therefore, incredibly important to accompany the evolution of the needs of the consumers. However, the introduction of such a disruptive new service must be accompanied by the knowledge, trustworthiness and reliability that a brand like EDP conveys. This is why Bairro Solar EDP's brand identity will remain similar in some ways to EDP's brand identity. However, there are two aspects where these differ the most. In **personality,** Bairro Solar EDP as a person is described as young, innovative and probably too good to be true. That is mostly due to the fact of the service being so new, therefore very innovative, and maybe too appealing to the consumer as it is a service with no investment needed; according to the quantitative research proposed in the group report, the greatest barrier for an individual to not join solar energy is due to how expensive it is. On the other hand, these minor differences on personality are going to inevitably change the consumers self-image as someone who feels "that using Bairro Solar is a smarter, more cost effective and more environmentally friendly choice".

17.3 Positioning

To first create a positioning statement, one must evaluate and understand what invisible attributes are present within the service or product. The major role within the statement is to guarantee and assure customers that the desired benefits that constitute the exclusivity of said product is clear and transparent (Kapferer, 2012). Therefore, one of the first steps to build a strong positioning statement is to look at what might constitute as competition for this service. However, since Bairro Solar EDP is a service and nothing alike in the market matches it there is no direct competition.

The positioning statement proposed in the group report, follows Bairro Solar's brand identity by focusing on the offering of solar panels to its customers and allowing anyone to be a part of the energy revolution that the world is facing. EDP, a company with over 40 years of expertise, puts renewable energy in the hands of anyone that lives in a villa at no direct cost.

18 EDP's brand architecture

It is important to mention that when a brand is released the brand owners must interpret how this brand might correlate with the others within its portfolio. It describes how consumers and managers alike should perceive the links and relationships between brands. The EDP group encompasses the entire supply chain of energy, production, distribution and commercialization. The focus of this report is within EDP Comercial which where *Bairro Solar EDP* is included. There are four types of brand architecture, those are branded house, house of brands, endorsed brands and sub-brands. EDP will act as an endorser for the sub-brand *Bairro Solar EDP*, which means that the sub-brand is classified as an endorsed brand. Aaker (2004) praises endorsed branding "because they allow brands to be stretched beyond their existing zone of comfort," and "protect[s] brands from being diluted from overstretching".

19 Product and Service

A product "is anything that can be offered to a market to satisfy a want or need". It not only includes physical goods but also services, experiences, events, etc. The way to assess the products' customer value is by addressing each of the five levels of the customer value hierarchy. Firstly, there is the core benefit that represents the benefit or service that is being bought by the customer. After that, there is the basic product which is what is included in the core benefit. Thirdly, the expected product which, as the name suggests, the expectation of attributes of benefits usually associated with the purchase of the product Then, the augmented product is what the brand will offer and will often exceed customers' expectations. Finally, the potential product includes every possible augmentation and upgrade that the product might undergo in the future as a way to satisfy customers and distinguish their offering (Kotler and Keller 2012). In the perspective for Bairro Solar EDP the core offering is the provision of electricity in the form of solar power, the basic product is the solar panels, the expected is the included installation of the panels and that these will be of high quality, the augmented is the lack of an investment from the client and the potential is to be defined as the needs for this service evolve. Now, it is important to understand that offering the best product might often not imply the one with the greatest quality. That premium category is a very niche market. Whilst in some markets the best product is the one that better helps solve the consumers need no matter the price in others it just might be the one with the best quality/price ratio (Kapferer 2012). In the case of Bairro Solar EDP, the product is the photovoltaic panels. According to Kotler & Keller, the classification of consumer goods is divided into convenience, shopping, speciality and unsought goods. The first ones are included into purchases that imply low involvement. These can be frequently bought and with minimal effort. Speciality goods are the exact opposite; for these, consumers are willing to make a special purchasing effort. The ones that consumers do not usually think of buying are unsought goods – which include, for instance, life

insurance gravestones, etc. Finally, there are shopping goods that are usually compared on the basis of price, quality and style. Homogeneity within shopping goods suggests that the difference in price is enough to justify comparisons. On the other hand, heterogenous goods offer qualities or benefits that transpose differences (or not) in pricing. The case for EDP's solar panels is clear. The benefit, compared among the different solar offerings, is in terms of the amount of money saved each month, hence the offering can be classified as a **heterogenous shopping good**. However, EDP's offering will not be of solar panels but the creation of communities that will more efficiently and, without an initial investment, be able to generate solar power. Since this is a whole new service, consumers will not be able to compare it to the next best alternative, additionally, EDP's uniqueness and overall superior product will allow them to best succeed in this market.

Kotler and Keller (2012) define a service as "any act or performance one party can offer to another that is essentially intangible and does not result in the ownership of anything". By definition, that is exactly what a solar community is. EDP will install and service the panels that will be in the producer's roof and manage the community thereafter created; furthermore, it is quite clear that this project can be described as a major service with accompanying minor goods or services. Plus, this designation usually implies a capital intensive good for its realisation, in this case the photovoltaic panels. There are a few distinctive characteristics of service that greatly affect the future of the marketing mix. Intangibility, for example, is the fact that services cannot be seen, tasted, felt, heard or smelled before they are bought. It is the job of the service company to convert the intangibility of services into actual benefits that people can relate to in Bairro Solar's case it is the monthly savings. Secondly, there is inseparability which means that consumption and purchase of a specific service are done simultaneously. Another aspect that is very important is that the service output may vary deeply depending on whom, where and when the service is provided. To increase quality control there are a few steps

that the service organization can take. It may invest in good hiring and training procedures, standardize the service-performance process throughout the organization or monitor customer satisfaction. For Bairro Solar, customer satisfaction is going to be assessed regularly and according to that result investments can be made in training employees or offering better support to the final consumer. Finally, the last characteristic of service is the fact that services may not be stored for later consumption. It is essential to make sure that demand is managed properly so there is not a lack of a specific service at a specific time of the day. In the case for *Bairro Solar EDP*, the demand for solar panels is predicted in the market potential, therefore the sudden increase in demand can be prevented.

19.1 Bairro solar EDP

Portuguese legislation has evolved to allow a group of people to share, buy and sell energy. For that reason, EDP decided to launch a new service in Portugal that has the potential to revolutionize the access to solar energy, called Bairro Solar EDP. A community will be created of both producers and neighbours who will share the solar energy produced by the photovoltaic panels. The **producer** is the one that is responsible and able – due to a number of requirements including size of roof and whether he/she is willing to have them installed – to install the solar panels, therefore he/she will be the one that shares the energy produced. On the other hand, the ones who do not meet the requirements above and want to be part of a community will be the **neighbours**. They can join and leave the community at will and take advantage of the solar energy produced. Both producers and neighbours will pay for the energy produced at a discount. However, the producer will benefit from a superior discounted tariff compared to the neighbours due to the added responsibility and provided space. The number of neighbours and producers accounted for each community will be computed using EDP's algorithm. Another requirement for the creation of these communities is that both producers and neighbours must be at least 500 meters from each other. Communities will be formed through EDP's website

and the process is divided into five phases. The first is the creation of the community, where the producer indicates the space available for the installation of solar panels as well as its consumption habits. The second stage aims to attract neighbours according to the number of panels recommended on phase one. Later, the feasibility of said community is assessed and a proposal is made. After accepting said proposal, EDP will procced to the installation of the solar system and the neighbours and producers will start to share energy. The selected business model is one where the photovoltaic panels are installed and serviced for free, more on that in the group report. The self-consumed solar energy is sold at a discounted tariff, as described above, and the unused energy will be sold to the grid. Producers are contractually obliged to stay with EDP for at least 15 years. In case they want to leave the community, a removal fee will be charged.

20 Roadmap to the future

The world needs to be less reliant on fossil fuels for energy. The change to renewables will make one of the world's largest economic sectors into one that is more sustainable, secure and affordable for everyone. The decentralisation of produced energy represents the future, and it is one of the main values behind this brand. One of the many reasons why, is because current power plants operate on average at about 50 percent efficiency. According to (The Ecologist 2019), future energy plants are expected to be a lot more common and far smaller. EDP is following a trend by allowing its consumers to form communities so the energy produced is more efficiently distributed and it is owned by EDP. A suggestion for the future of this product is to branch into more than just villas; even though logistically and bureaucratically is a lot harder to accomplish, it allows for everyone to have access to solar energy and for EDP to be less dependent on the fossil fuel industry.

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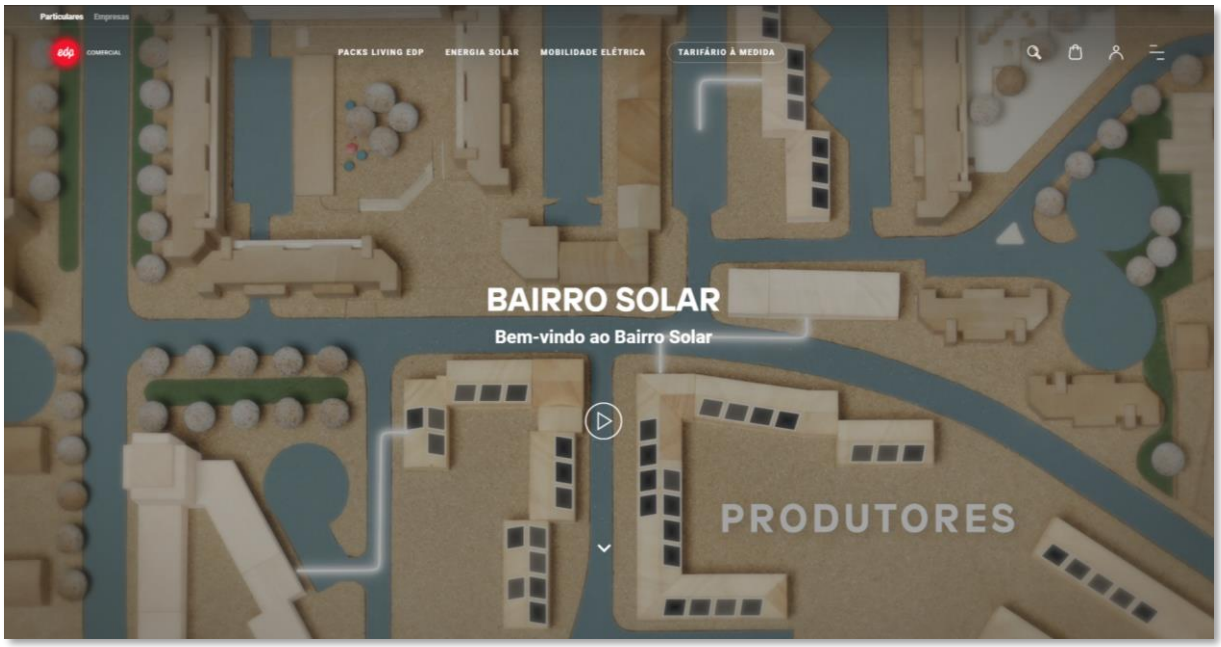
Appendix

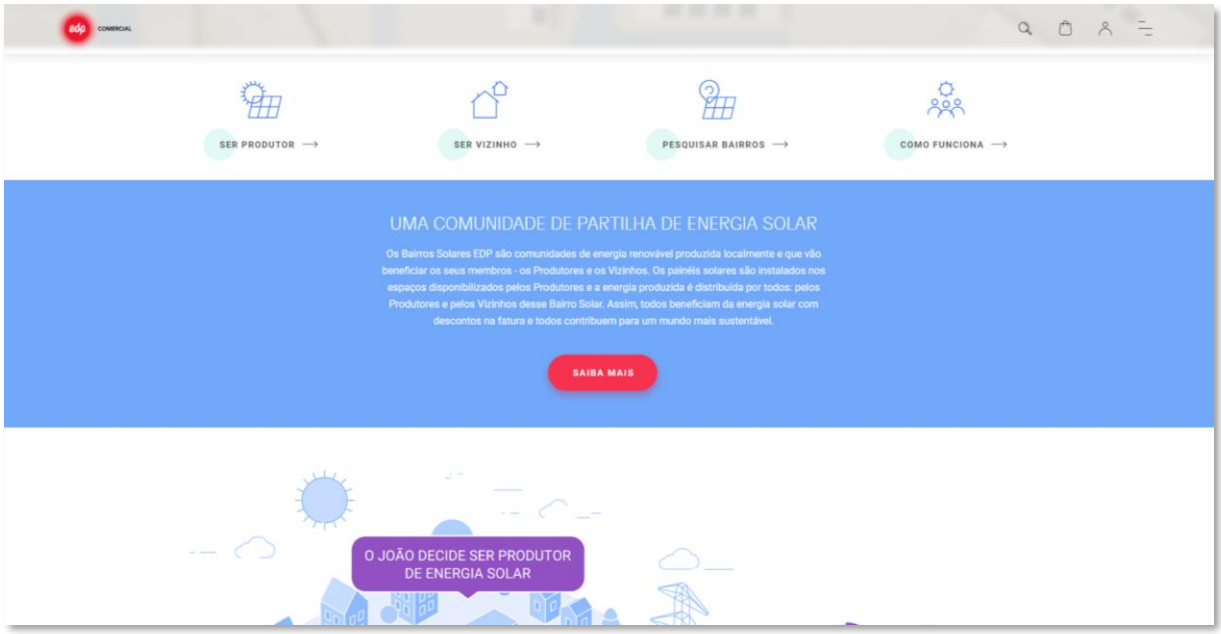
Exhibit 79 - Logo for Bairro Solar EDP

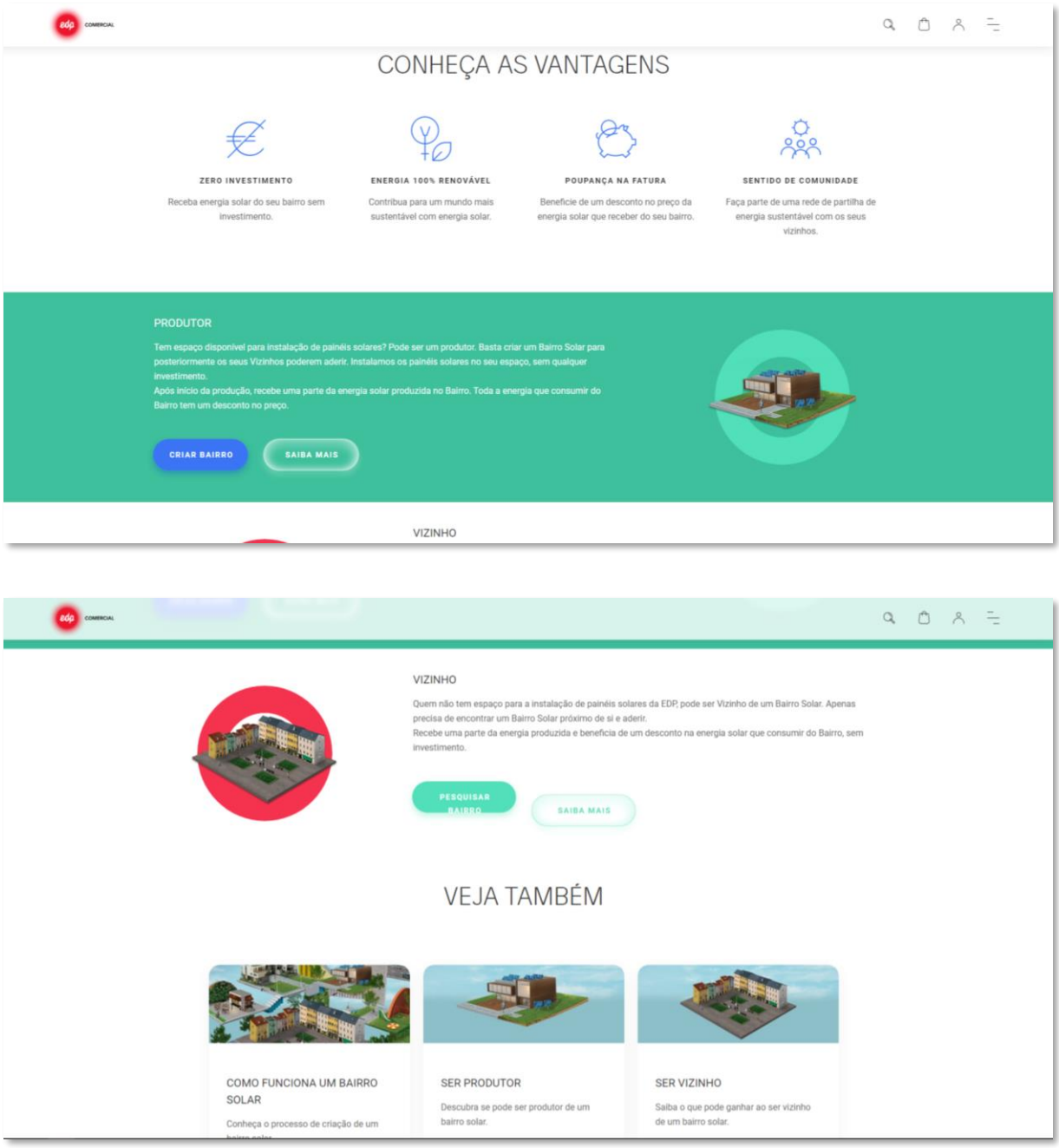
BAIRRO SOLAR edp

Exhibit 80 - Proposed character look and feel

Exhibit 81 - Micro Website "Bairro Solar EDP"

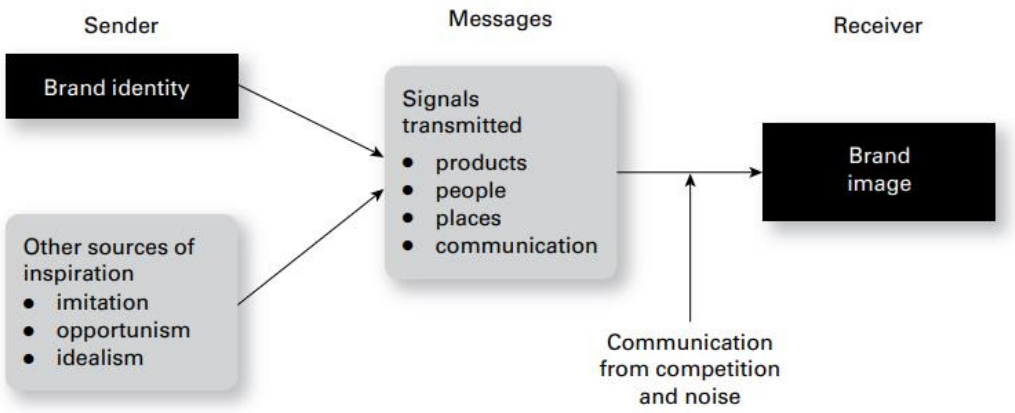






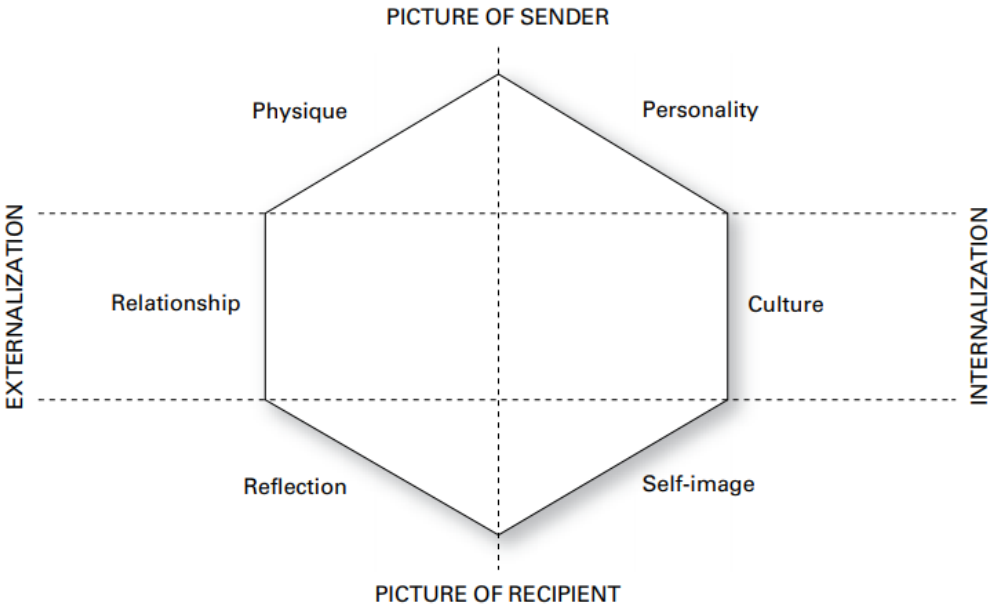
Source: (EDP Comercial, 2020)

Exhibit 82 - Identity and image



Source: Kapferer, 2012

Exhibit 83 - Brand identity prism



Source: Kapferer, 2012

Exhibit 84 - EDP's brand identity prism

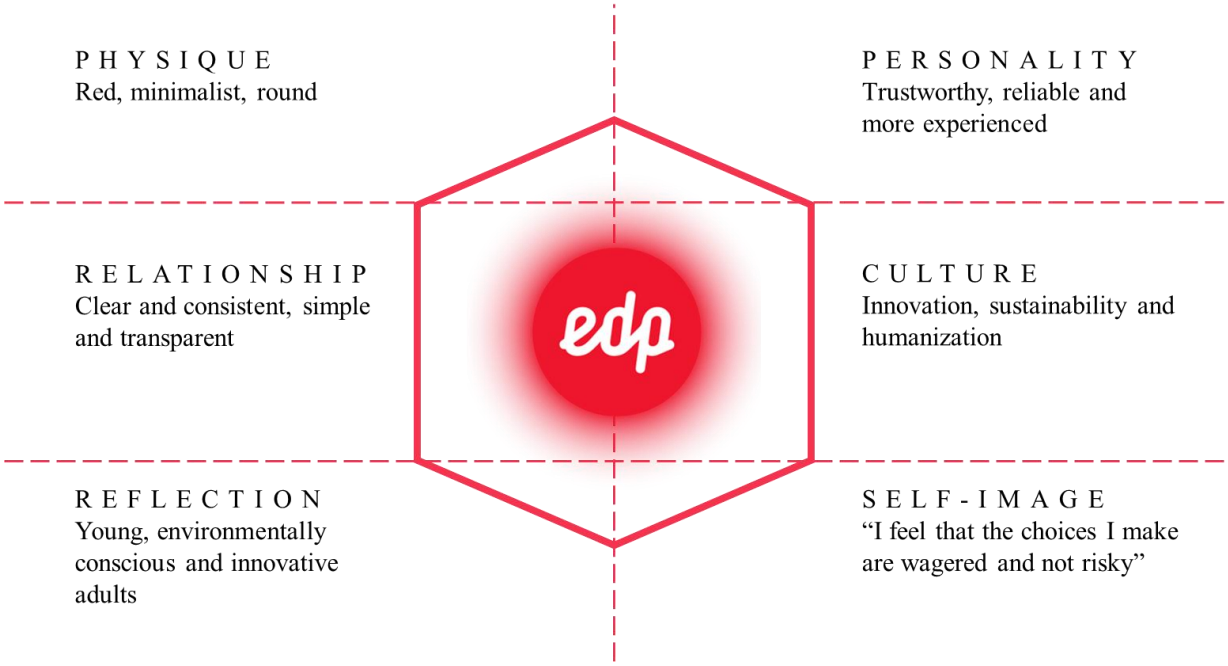


Exhibit 85 - Bairro Solar's brand identity prism

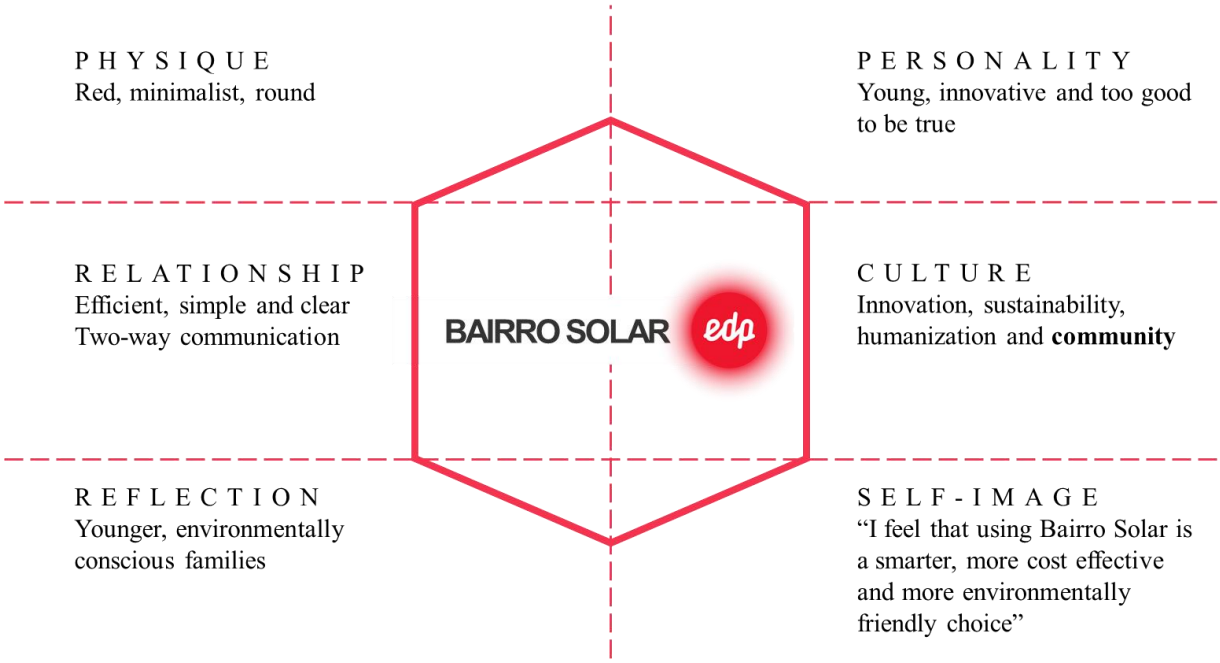


Exhibit 86 - Dow Jones Sustainability Index definition

From the S&P Global website: “The Dow Jones Sustainability Indices (DJSI) are a family of best-in-class benchmarks for investors who have recognized that sustainable business practices are critical to generating long-term shareholder value and who wish to reflect their sustainability convictions in their investment portfolios. The family was launched in 1999 as the first global sustainability benchmark and tracks the stock performance of the world's leading companies in terms of economic, environmental and social criteria.

Created jointly by S&P Dow Jones Indices and SAM, the DJSI combine the experience of an established index provider with the expertise of a specialist in Sustainable Investing to select the most sustainable companies from across 61 industries.

The indices serve as benchmarks for investors who integrate sustainability considerations into their portfolios and provide an effective engagement platform for investors who wish to encourage companies to improve their corporate sustainability practices.”

Source: DJSI Index Family, 2020