A Work Project, presented as part of requirements for the Award of a Masters Degree in Management from the NOVA – School of Business and Economics.

BUSINESS MODEL: WHAT SHOULD BE THE STRATEGY USED BY SMART GALP TO IMPLEMENT AND POTENTIATE ITS VALUE PROPOSITION IN THE PORTUGUESE MARKET?

JOANA CATARINA LUZ GOUVEIA | 1066

A Project carried out on the Field Lab in Entrepreneurial Innovative Ventures, under the supervision of:

Professor Filipe Pamplona Castro Soeiro

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Executive Summary

For a long period, energy has been seen as an invisible good. In the users' mind, choices and costs related to energy are not connected. However, for consumers to change their behavior these two may be connected and consumers should become aware of the consequences of their actions and motivated to adjust them. Through the development of Smart meters, the next generation of gas and electricity meters which offer a range of intelligent functions and provide consumers with more accurate information, Galp Energia created Smart Galp - a revolutionary service that allows the consumer to control, monitor and influence the energy consumption of his household and automobile.

This work project studies the best strategy to implement and potentiate Smart Galp value proposition in the Portuguese Market. The objective is to launch the service in the market. Thus, after all the internal and external analysis, it was defined the business model and the competitive strategy. A risk assessment and recommendations were conducted in order to achieve a successful implementation.

Key words: Innovation in the energy sector; Energy Market Needs; Energy Efficiency, Smart Meters; Tri-fuel Offer; Implementation in the market; Communication and Marketing of Smart Meters

Literature Review

Consumers' awareness regarding the climate change challenges is high[1], mainly due to the intensive media exposure; however it has been hard to translate it into a sustainable and efficient behavior regarding energy[2]. Specific actions to reduce energy consumption may lead not only to the reduction of carbon emissions, but it may also mean significant cost savings for both consumers and companies involved[3].

Technologies of meter electricity and natural gas used to have as priority an operational readout system,

[1] According to a study provided by OCDE in 2011 – Industrial Biotechnology and Climate Change, Opportunities and Challenges 'Consumers are increasingly making purchasing decisions based on environmental considerations.'

[2] 'As many surveys over the past couple of years have shown, there are an increasing number of consumers who are concerned about climate change and who say they are willing to make changes in their purchasing and lifestyle choices. However, when looking at actual consumer behavior, it is clear that actions have yet to catch up with the level of concern.', from AccountAbility - What Assures Consumers on Climate Change?, 2007

[3] In accordance with a Power scorecard study, conserving energy, by taking actions like insulating/weather-stripping your home and purchasing Energy Star certified (high efficiency) appliances, is usually an economical and environmental action since it minimizes the energy needed, meaning less burning of fossil fuels which also means lower emissions of carbon dioxide (CO2).

reliable and inexpensive. However, these systems are very limited in providing information, since they only allow the transmission of discrete information and require human intervention for its reading. This has implications on the provision of information for the customer, representing constraints that hinder decision making timely. This entails consequences in terms of households not optimizing consumption of both electricity and gas. Therefore, a new generation of energy meters called smart meters has been developed. Smart Meter is an intelligent meter that can be read remotely. It does automatic reading, processing and transmission of metering data, telling exactly how much energy is being used at home at any single moment, and showing how the amount of energy used changes through the day[4] (Energy Community Secretariat, 2012). However, smart metering technologies regarding energy efficiency, and in specific their articulation with behavior changes, are currently in a phase of investigation and development. Therefore, they are considered an area with huge potential[5] in the world context of climate changes.

Moreover, the observable trend of a substantial price reduction of this type of equipment prospects in a nearly future their generalized installation with a positive cost-benefit. However, public acceptance of utility programs and initiatives such as smart meters development is crucial for their deployment. Only 10% of the world's meters are considered "smart", however it is expected this number to change drastically during the next years (Karlin, 2012)[6].

Mainly due to consumers' experiences in other industries (like media and entertainment) where they have an active role, they are willing to be more involved and assume a dynamic part regarding energy and associated technology (IBM, 2007). Moreover, connected devices, such as laptops, mobile phones and tablets are changing customers' experience and have become a way of life for many, increasing customer interface solutions (Rigby, 2011; Deloitte Research, 2011). Smart meters open a new perspective of relationship with consumers' choice, potentiating an active role of consumers in energy efficiency. The

[4] This will help to understand how much the energy use is costing and will give information to support consumers in becoming more energy efficient due to the bidirectional data communication in real time (Energy Community Secretariat, 2012).
[5] Consult appendix 1 to see the potential of Smart Meters
[6] Public Acceptance of Smart Meters: Integrating Psychology and Practice, Beth Karlin, University of California, Irvine, 2012 ACEEE Summer Study on Energy Efficiency in Buildings

development of mechanisms of interaction with consumers' choices is extremely important. Especially in times where, in the top of energy's politics priorities we can find energy efficiency due to the increase of energy costs and its impact on the climate. According to the National Action Plan to Energy Efficiency (PNAEE), ENE 2020 aims to reduce the final energy consumption in 20% by the end of 2020.

However, there is a trend to the raise of energy consumption by the households. The weight of energy services in the total domestic consumption increased from 28% in 1996 to 43% in 2010 (INE/DGEG, 2011).[7] Therefore, if consumers can access to detailed information regarding the way and the timeframe they spend energy, as well as the costs and environmental impact of their spending, they are allowed to assume a more active role in energy efficiency (Thorne et al. 2006). The role of feedback is to make the consumption of energy visible, providing consumers the opportunity to have information more directly, in some cases following online detailed communication of information and data, comparable and comprehensive about energy consumption pattern, leading to a change of energy behavior (Darby 2006).

Smart Metering is considered within Europe and indeed globally, as a key building block in the smart grid and the most cost/effective method for increasing end-consumer engagement and involvement (Sromback et al, 2011).

Several studies (Ehrhardt-Martinez et al., 2010; Darby, 2006; EPRI, 2009) point that with the change of consumers' habits, there is a 10% potential decrease in energy consumption (Galp, 2010). Savings can be higher if consumers take advantage of more economic tariff periods, so that system demand peaks can be reduced. However, consumers' typically adopt new technologies only after they become sufficiently mature, which is faster when there are pressure exerted by public policies and R&D support (Capros et al, 2010). Yet, if they have the guarantee that by adopting new technologies they will reduce the cost associated with energy services, they will not hesitate (Capros et al, 2010).

[7] The total monthly spending by household is, on average, 193€ by house, including spending on vehicles, which corresponds to 121€ per one vehicle (Galp 2011), electricity emerges as the second main source of energy consumed in households, representing 50€, and natural gas represents the remaining 22€ of the total energy expenditure (ERSE 2011).

Aim and Scope of the work project

The aim of this work project is the development of a strategy to implement and potentiate Smart Galp[8] value proposition in the Portuguese Market. Galp Energia aims to position its brand as the number one according to consumers' preferences[9]. In order to achieve such an ambitious goal, the company intends to establish a strong relationship with its customers, offering them an added value service. Therefore Galp is constantly looking for solutions regarding energy efficiency.

In order to foster energy efficiency, Galp Energia developed the Smart Galp Program, which consists in a user-friendly energy management system that allows the consumer to control, monitor and influence the energy consumption of his household (electricity, natural gas, and road fuel). It is a service based on the development of a tri-fuel commercial portal, where Galp Energia interacts with its domestic customers, promoting an energy search management.

Currently in the trial phase, it is important to think beyond and understand the best strategy to engage and involve customers into this new service, in accordance with a segmentation marketing strategy. It is essential to identify correctly the target audience and the strategies to communicate to this target.

The research question to this work project is: *What should be the strategy used by Smart Galp to implement and potentiate its value proposition in the Portuguese Market?* To answer this research question, other sub-questions have to be analyzed: *What is the biggest challenge in the energy industry?, How to solve it?, What are the key issues to consider when implementing the Smart Galp Project?, How is the Portuguese energy market?, What are the sources of competitive advantage of Smart Galp?, How these ones can be potentiate within the implementation in the market?, What do Portuguese customers want in the energy context?, How can Smart Galp align its services with costumers' preferences?,* and

[8] The Smart Galp project is an innovative action of Galp Energia in the energy market. It is a service based on the development of a tri-fuel commercial portal of integration with domestic customers of electricity, natural gas, and road fuel. The project is based on an integrated system of intelligent devices, which have behavior inducing solutions for energy saving and a more efficient modeling of energy consumption.

[9] Currently, at the customers' eyes, the brand image is consistent with its position. Galp Energia brand is one of the few brands' in Portugal with a total reputation close to 100% - specifically 96% - and with a mind awareness of 54%. In 2011, for the ninth year running, Galp Energia was voted a "Trusted Brand", totaling 61% of the votes in its category. The brand also achieved high results on its attributes, reaching the first place in Quality, Cost-Effectiveness, Image and Perception of customers' needs.

What measures are necessary to build customer loyalty?. Moreover an issue tree was created (figure 1), and three main branches were identified, namely: market share, cost optimization and sources of competitive advantage. Through these branches, a strategy will be recommended.

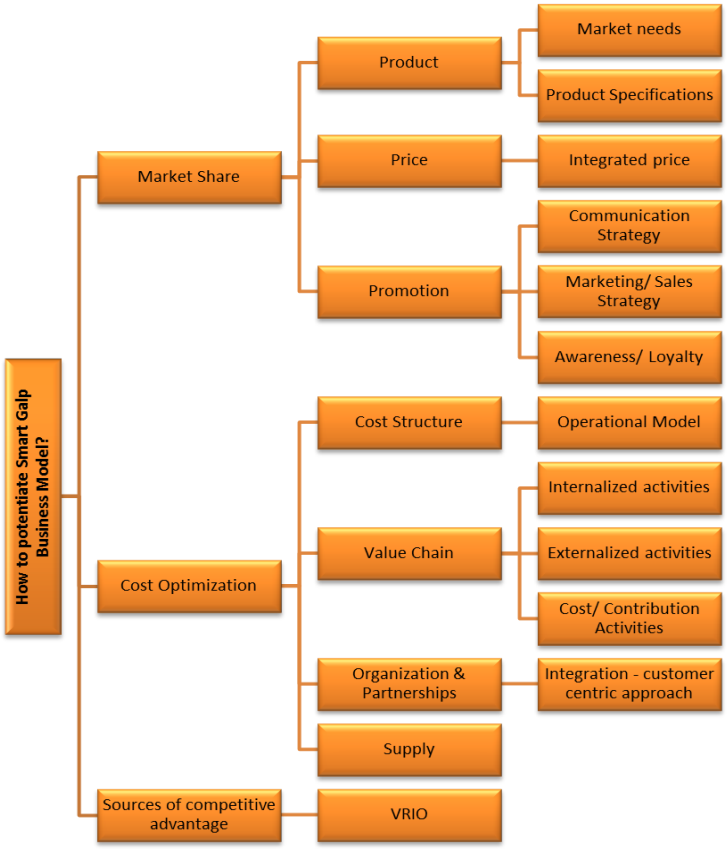

Figure 1: Issue Tree

Market liberalization and challenges of the industry

In compliance with the Directive number 2003/54/CE, since September, 2006, all the consumers in Portugal can freely choose their electricity supplier. However, regulated tariffs for sale of electricity and natural gas to end customers only ended up at 2012. Associated with the energy market liberalization, there is expected an increase of competition. Therefore, the final consumers of residential energy search for several conditions in this service, namely a better quality of services provided, and offers with differentiated prices, which allows them to improve life standards in their residences and consumer behaviors.

According to Kowsary and Zerrifi (2011) there are different variables that affect the decision of the energy supplier, endogenous factors that depend on the residence characteristics (family income to energy

consumptions habits, typology and area of the house, households' age, level of education and access to information, as well as life style and social status) and exogenous factors (location, climate, market conditions, energy politics, price, accessibility, operational complexity). The choice is extremely complex since it inter-related economic, social and cultural rights with the physical environment of housing. This is especially relevant in the case of Galp, since, according to Mills and Schleich (2012), Portugal is the European country where the education level has more influence on concerns about energy saving in housing, and concern about emissions of greenhouse gases and the presence of children in the household were also variables that make the Portuguese households save energy.

Regarding opportunities to the adoption of smart meters, the economic crisis aligned with the unstable political situation, and consequent reduction of purchasing power makes energy to be used more consciously (Banco de Portugal, 2012). Moreover the increasing ease of transmitting information, introduced with the so-called Web 2.0 allows disseminate information so affordable, quick and easy.

However there are some weaknesses that should be highlighted. The increasingly aging population in the country (Rosa, 2012), despite being a reflection of important social advances, causes a greater percentage of people to be resistant to change and not regard with favor investments without immediate payback period. Additionally, the complexity of the rules and laws in vigor in the country and the lack of celerity of the judicial system, in Portugal, also make it more difficult for citizens to accept innovations in this area, since they do not feel their investments safeguarded (Rego, Sarrico, & Moreira, 2006). The insufficient monitoring of compliance with legislation in vigor does not encourage the fulfillment of new requirements and measures proposed. The diversity of the residential sector in Portugal and all the variables that affect consumption and savings are a weak point that can be seen as a challenge.

The threats to the implementation of new ideas that foster energy savings pass by difficult access to credit, the natural resistance to change, lack of medium-term strategy for the energy sector, and also some technical barriers such as the lack of standardization, the limited number of manufacturers offering smart metering hardware, and the absence of economies of scale. The volatility of energy markets and energy

prices makes the threat of an energy crisis that encourages the adoption of energy-saving measures that serve to reduce the risk associated with the energy dependence (Ruiz, Guillamón, & Gabaldon, 2012).

In accordance with McMakin et al (2002), people become more receptive to adopt behaviors conducive to an efficient use of energy in three situations: When there is a direct benefit for them (eg, increased comfort and lower costs); If they have the opportunity to monitor their own consumption; If they have easy access to information relevant to the adoption of better behavior in terms of energy use.

Moreover, Stern (2011) claims that it is essential to give a financial incentive to those who invest in energy efficiency. A direct incentive for investment in efficiency makes the choice logic and economically feasible, while at the same time, the consumer feels that his conduct is enhanced by receiving a "prize".

Energy is consumed as an invisible product, therefore, as it is never the focus of the activities where people use it, customers are unaware of the direct impact an activity has on their consumption levels. The consumer mind does not connect the activity done to the cost of energy, and this is a barrier to successful energy saving and other efficiency programs (Darby 2006, Stromback 2010, Mourik 2009). Consequently, consumers must become aware of the consequences of their actions and motivated to adjust them. Social acceptance is a requirement for an effective implementation and diffusion of smart meter technology and related services (Wüstenhagen et al., 2007 and Wolsink, 2012). Therefore it is important to assure that the most powerful stakeholder – consumers, maximize their value. Zeithaml (1988) and Sheth et al. (1991) defend that only if customer-perceived benefits of smart metering surpass the perceived drawbacks, consumes will perceive a positive value and then be willing to pay for a service. However, according to customers' perspective, price is a sacrifice that reduces perceived benefits.[10]

There are two critical points that should be considered when a utility decide to provide a service with smart meters. Firstly, this service has to provide more benefits than perceived drawbacks to customers, since this is the only way that there is willingness-to-pay (Zeithaml, 1988). Secondly, instead of set the price with a cost plus method, it should be set based on an assessment of customers' willingness-to-pay to ensure a

[10] Consult appendix 2 to see a visualization of the value of Smart Meters for stakeholders

positive customer perceived value that would lead to customer acceptance and purchase.

Concluding, to guarantee market acceptance, the customer-perceived benefits of smart metering (consumption and cost reduction, home appliances' automation, convenience, between others) must exceed the perceived drawbacks (such as price, clarity of information, or resistance to change)[11].

Methodology

Throughout this work project, in order to propose a Business Model to Smart Galp, the approach followed starts with a better understand of the company itself, and a deep analysis of Smart Galp Project. Then the resources and capabilities available within this new service are studied and analyzed to understand how these resources can be leveraged in order to create a sustainable competitive advantage for Galp Energia. Moreover an International Benchmark, Competitive Assessment, SOWT/TOWS, and a Porter Analysis are conducted. The access to literature review (research papers, books and research studies covering the theme of smart meters development and implementation), as well as the semi-structured interviews with energy regulators allow to propose a strategy to implement and potentiate Smart Galp value proposition in the Portuguese Market. Moreover, the opinion of a sample of Portuguese consumers is also considered in order to determine the best approach to this implementation, completing a 360 degree analysis. Finally it is relevant to suggest a risk assessment and detailed recommendations to support the strategy developed.

Firm Description

Business Opportunity

Technological advances in equipment and construction elements have been made possible to obtain the same quality of life with less energy consumed, and consequently more efficiently.

The energy sector is undergoing constant changes in Europe, and more concretely in Portugal[12], requiring solutions which are innovative and technologically sustainable in environmental terms. European

[11] Since there is a market potential, this is possible to achieve if there is a segmentation of the target audience, capturing firstly the innovators and early adopters who are more likely to try new things.

legislation also calls for energy efficiency[13], there are inclusively a number of key EU legislative instruments promoting smart metering in order to enable consumers to regulate their energy consumption through properly information of actual energy consumption and costs. There is not an ideal receipt to save energy in a residence. The ideal is to use an integrated approach, which includes equipment change and behavior change. Following these drivers (need for efficiency, active role for customers, and innovation and differentiated services offers), in 2011, Galp Energia[14] installed the necessary equipment on 120 pilot-customers and developed all information systems, required to support the project, in partnership with ISA, Logica and MIT Portugal. The Smart Galp solution will simultaneously promote an energy search management and the creation of innovative ways of commercial interaction with potential customers. At home or in the car, the project is based on an integrated system of intelligent devices, which have behavior inducing solutions for energy saving and a more efficient modeling of energy consumption. Summarizing, in order to ensure future growth, and once energy resources are limited, Galp Energia recognized the need to innovate with Smart Galp.

Services offered

The Smart Galp service includes the installation of measuring equipment for continuous consumption, transmission and processing data in real time, provision of information online, compare individual data regarding consumption with standardized values that constitute a reference to achieve, accurate determination of CO2 footprint associated with energy consumption, and systematic generation of recommendations for changes in consumption patterns, all in an integrated form in order to reduce energy consumption and associated costs, and shift any discretionary energy usage away from peak consumption times.

[12] Concerning Portugal, ENE[12] 2020 aims to reduce the final energy consumption in 10% until 2015, and 20% by the end of 2020. Moreover, since the beginning of 2013 all the consumers in Portugal can freely choose their supplier of electricity and natural gas, opening the competition between operators.

[13] All Member States of the EU are required to install by 2020 intelligent metering systems for electricity consumption for at least 80% of customers.

[14] Galp Energia was created in 1999 from the merger, acquisition and integration of several companies in different times, and is now an integrated multi-energy operator, present in all stages of the oil, natural gas and electricity value chain. It is the only Iberian operator to produce and market all forms of energy, offering a range of products and services that meet consumers' needs for mobility, comfort and efficiency.

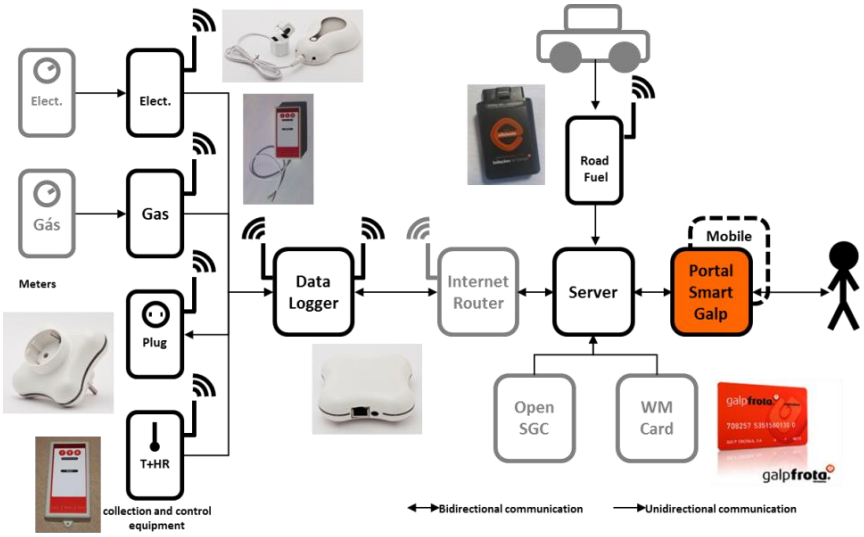

Figure 2: Service Operation Model

Through Smart Galp service the consumer can include three products: electricity, natural gas and road fuel, and are given to the consumer the possibility to have an active role and be the major player in this service due to the creation of a web portal and a mobile application. By electing this service, it is given the opportunity, through the installation of smart meters and the use of a digital platform and mobile app, to:

Awareness	Detail view by energy: consumption history, notifications, invoicing, time periods and events
Recommendations	Implement opportunities for improvement suggested by the system
Control	Control equipment in real-time (measuring consumption of individual devices and schedule their operating)
Score consumptions	Score their consumptions (Relative Indicator: establishes a ranking of energy efficiency, allows users to compare its consumptions with other users)

Doing this the consumer can benefit by use energy more efficiently, reduce costs, and have a lower environmental impact. Since this is a win-win situation, Galp Energia will also benefit by being associated to an image of innovation, being the operator that offers a differentiated offer and building loyalty with customers[15].

Mission, Vision and Strategic Objectives

The project's mission is to deliver to customers the potential of improving energy efficiency in the residential environment. To this end Galp intend to develop an integrated interface with the end user,

[15] The concept of this tri-fuel service is explained in Appendix 3

supported a package of equipment installed in the homes of end users, enabling instill behavioral changes in terms of energy savings, more efficient modeling of energy consumption and test new models of relationship between the energy supplier and the customer, in the current context of major technological breakthrough. Through this program, Smart Galp will verify which are the consumer's profile that can achieve higher impact, to afterwards target consumers which benefits surpass investment costs. With its implementation Galp Energia visions to be the number one energy operator in Portugal according to consumers' preferences within 3 years. According to the research question, there are some strategic objectives that are essential for the success of the implementation of this service. These are defined by area, and are expected to be gradually implemented in a three years' timeline. In the table below the objectives are presented with KPI's[16] to monitor their efficiency

Area	Objective	KPI's
Organizational	- Be a solution regarding energy efficiency - Implement a customer centric culture - Have the highest market share in energy integrated services in 2015	- Customer satisfaction - Market share
Marketing	- Develop and implement marketing strategies to increase brand awareness - Develop and implement loyalty strategies to increase value and retain customers	- Brand awareness - Sales revenues - Customer satisfaction
Communication	- Customize communication for customers	- Campaigns efficiency
Operations	- Decrease operations/ distribution costs in 10% in 2015 - Launch market version in September 2014 - Improve services quality	- Customer satisfaction - Internal cost efficiency
Customers	- Consumption and cost reduction[17] - Provide all consumers with accurate monthly invoices rather than estimated invoices - Assure a level of innovation correspondent to the market and consumers needs - Improve data related to the target	- Customer satisfaction - Sales revenues

Business Model

Considering the reduction schemes of energy, smart metering can provide the foundation for a completely different approach in this regard. Nevertheless, the success of smart metering implementation depends on

[16] Key Performance Indicators
[17] Conducting a study with 120 residential-trials, it is expected a 5% reduction in energy consumption (quantity effect), and sustained savings to households, about 10% (quantity and price effect).

various factors, since how to present the information to domestic consumers to the right technology choice. Assuming a customer centric approach, a business model is presented, which will be validated and improved through specific recommendations.

Value Proposition

The implementation of Smart Galp is not a technological issue alone, since it also requires social acceptance by various stakeholders, and thus a marketing and communication strategy. The value proposition is extremely important to ensure the right value is communicated to customers in a consistent way. One of the most important key drivers for competitive advantage and economic value creation is customer value (DeSarbo et al. 2001; Porter 1985). The objective of Smart Galp is to deliver to customers the potential of improving energy efficiency in the residential environment. Therefore a B2C business model is applied and the whole strategy is defined for the final customer. Smart Galp value proposition for consumers is:

– More accurate and frequent billing

– Cost reduction by better insight into consumption

– Ability to switch significant consumption to less expensive hours

– Intelligent load management as a consumer / home automation

Revenue Structure

By investing in smart meters technology, the revenue model must be aligned with the expected benefits and provide assurance of return. It is important to note that the success of this service may lead to an efficient energy use that will reduce throughput. It appears that Galp is investing to reduce its own revenue. However with Smart Galp, the company is rewarded for its success in delivering an added value service, providing the capacity to avoid network congestion. Networks are expected to operate more efficiently, with less headroom than currently required, if peaks in demand are smoothed out through demand response offerings enabled by smart meters technology. Each client of Smart Galp will pay monthly its own spending on energy plus a value for the service, which include an intelligent system, all equipment

and installation. The value of the service is fixed during the minimum period of permanence contractually agreed, in order to cover all the costs with equipment. After this period the value of the service must decrease, since the equipment's cost will be amortized. Then, loyalty measures should be taken in order to increase the value for customers. According to the customer survey, the revenue payment has a positive correlation with the benefits' provided by the services. Feedback, Home automation, Comparison between consumers, and Cost savings are benefits that add value for the service. It was previously establish between Galp and ISA[18] that 2/5 of the revenues provided from the service belong directly to ISA, and the remaining 3/5 to Smart Galp.

Operating Model

Smart Galp business operating model differs significantly from the current operations assumed by Galp, once the data gathered with smart meters allows a customer centric approach with specific recommendations suitable for each consumer. It is essential that this new operation model is carefully deployed in order to avoid unnecessary risks for all the stakeholders involved in the business. The supply process is represented in the following figure.

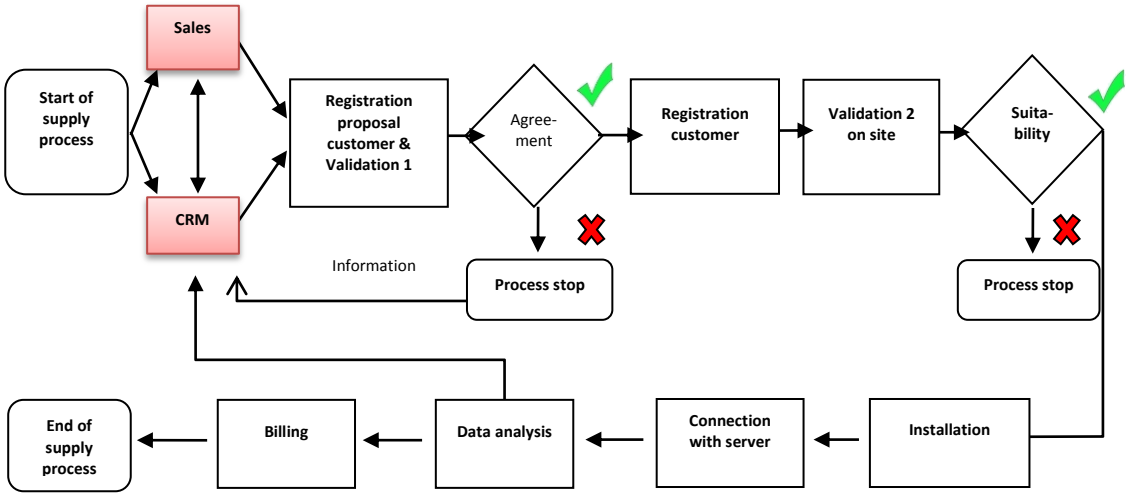

Figure 3: Operating Model

[18] ISA- Intelligent Sensing Anywhere is an internationally recognized technology-based company, providing "turnkey" solutions from the development of software and hardware, to providing services.

Value Chain Analysis

Currently in Portugal, electricity and natural gas are primarily generated in a centralized location, transmitted to the grid and ultimately distributed to the end user. Power flow is in the center of the entire value chain.

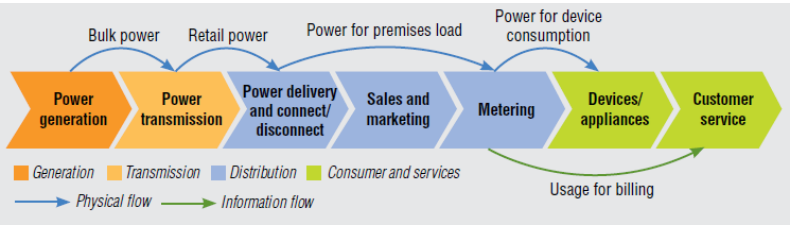

Figure 4: The traditional industry value chain (Source: IBM Institute for Business Value)

The new value chain created with Smart Galp enables real time data exchange, forcing Smart Galp to manage increasingly voluminous and complex new information flows in addition to energy flows. With this service, Galp Energia has the ability to forecast and balance loads and offer targeted products and services to customers on a more individualized basis. A variety of new participants that traditionally are not involved in the value chain will grow. That is the case of the consumer that will become an active participant. Moreover, information will flow in multiple directions, adding a remarkable value to the Smart Galp network. With this new value chain, Galp Energia is no longer a product centric to be a customer centric company, bridging the gaps of the first model.

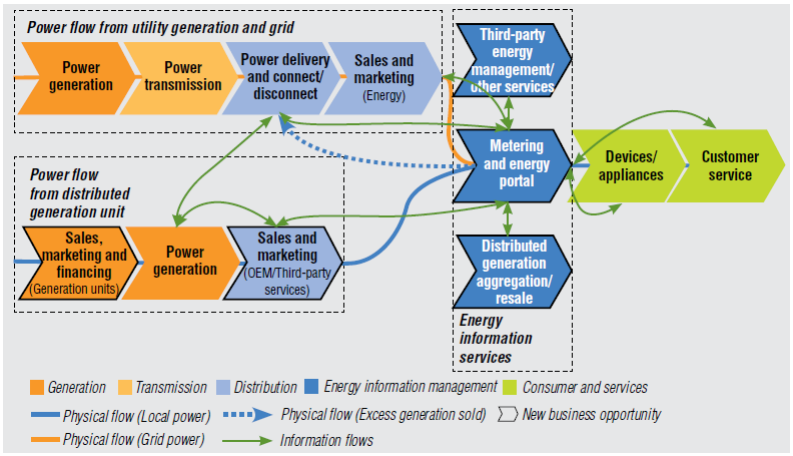

Figure 5: Increases in information flow could result in new business opportunities (Source: IBM Institute for Business Value)

Competitive Advantage (VRIO)

In order to achieve the *to be* situation of a customer centric service, it is essential that Galp Energia has a competitive advantage over competitors. The Smart Galp Project is innovative and has certain resources and capabilities that are valuable, rare and costly to imitate, being therefore a source of competitive

advantage. Through the analysis of the VRIO framework, it was possible to identify the competitive advantages that Smart Galp has that would be important to potentiate its value proposition in the market.

The most important assets are the service itself (tri-fuel offer) and the technology (web portal and devices), which took a long time to be develop and adjusted to consumers' needs. Therefore these two assets are considered as sources of sustainable advantages.

The access to a specific and valuable team as well as the close relationship to customers are considered vulnerable to imitate and consequently are not a source of sustainable advantage, but rather temporary.

Concluding, Smart Galp follows a hybrid competitive advantage model, however the most relevant ones belong to the differentiation advantage, since they have a well-diversified portfolio that would allow a permanent presence close to customers that will play an active role in this offer. Nevertheless, it could also be perceived a cost advantage due to the new technology allows the increases the productivity and reduces costs. In the following table there are represented the resources of Smart Galp and the respective competitive advantage.

Resource/ Capability	V	R	I	O	Competitive Advantage
Tri Fuel offer (natural gas, road fuel, electricity)	●	●	●	●	Sustained Competitive Advantage
Technology – (Web Portal; Devices)	●	●	●	●	Sustained Competitive Advantage
Access to Specialized teams	●	●	●	○	Temporary Competitive Advantage
Close to customers, nurturing the relationship and understanding needs	●	●	●	○	Temporary Competitive Advantage

Industry Mapping

The industry mapping is important to clearly identify all the players that interact with Smart Galp. For the development of the Smart Galp it was crucial to gather a wide range of skills in the areas of energy and energy efficiency, telemetry, communications, billing systems and customer relationship management, between others. While leader in this project, Galp Energia Group, decided to allocate their own competencies in the areas of distribution and marketing of natural gas and electricity and information systems.

For tasks related to research and development in the areas of determining the CO2 footprint, energy benchmarking, advice to change patterns and evaluation of behavior change was considered to be critical to engage the Portuguese scientific system, and has therefore been created a partnership with the MIT Portugal. The Project counts also with the experience and know-how of ISA, a leader in remote monitoring solutions applied to the areas of Energy, Environment, Security, Mobility and Health.

The required investment that allows the project to be tested was financed in 50% by Galp Energia Group and the remaining 50% by FAI (Fundo de Apoio à Inovação).

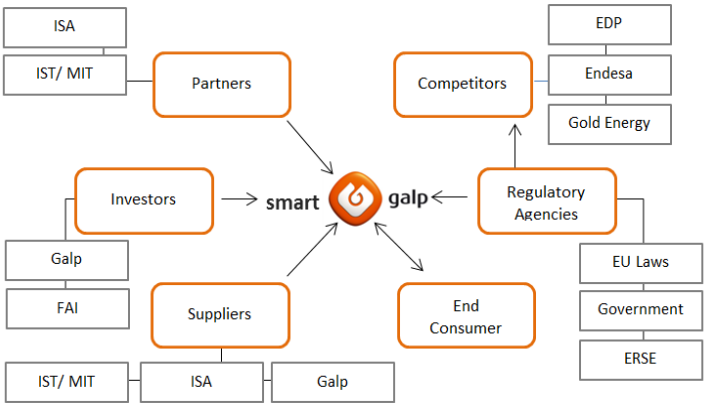

Figure 6: Industry Mapping

The partnerships created allow Smart Galp to introduce in the market a differentiated service which technologically reinvent energy meters, permits consumers to manage energy more efficiently, permits the creation of an online platform that will strong the relationship between Galp and the end consumer, bringing efficacy to the supply process. As there are European and national laws regarding the regulation of energy that must be followed, they are also included in the industry mapping of Smart Galp.

Galp Energia has some competitors; however, since Smart Galp offers a differentiated service, there is not a direct competitor[19], which is an important factor for competition in energy markets.

Competitive Assessment

International Benchmark

Over the last few years it is observable a growing development in the field of energy telemetry in the residential segment[20], highlighting the penetration of smart meter technology at a national scale in

[19] In Portugal, there are developments only related to the efficiency of power grids, an initiative promoted by EDP Inov Grid. However, their focus is related to improve the management of electrical distribution network, from a development perspective.

countries at the forefront of using this technological tool (eg: Italy, Sweden or Finland) and initiative in pilot projects worldwide, currently under a study stage of the impact of this technology implementation (eg: Britain, France, Ireland or Cyprus). According to the study *Empower Demand*[21], a pilot success heavily depends on the ability to meet consumer needs through the demand side program.

From several trials analysis[22] of smart metering in the USA, Canada, Scandinavia, the Netherlands and the UK it was possible to conclude:

- Feedback promises to be more effective when accompanied with goal setting[23];

- Weekly feedback plus advice seems to generate more behavioral change and savings than continuous real time feedback through a monitor only.

- To get advice on a longer term basis and additional feedback, internet promises to be an useful tool, through the incorporation of further analysis.

- An effective way to increase engagement and reduce consumption is through the comparison of individuals' consumption with their own historic patterns or with comparative households[24].

- Smart metering has the possibility for prepaid schemes for pay as you go meters both by phone or internet.[25]

- A program is more successful if focused on customers, being therefore essential to offer superior services benefits, pursue long-term vision, and ensure quality (Luck and Lancaster, 2003).

To conclude, from pilot studies it is clear the potential for reduction of peak load and reduction of overall energy consumption through demand response. However both types of reduction seem to depend a lot on consumer engagement.

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[20] Consult appendix 4 to understand the current situation of Europe regarding Smart Meters for Energy

[21] A project funded by the European Smart Metering Industry Group

[22] Darby (2006, 2010) from the Environmental Change Institute at Oxford University

[23] Motivational elements, such as goal setting, competitions and social comparisons, can significantly influence behavior and generate significant additional savings.

[24] Social Comparison Theory introduced by Festinger (1954) suggests that getting people to compare themselves to healthy models has proven to be an effective tool for behavioral change.

[25] Research literature indicates that savings for all keypad final customers are estimated to range broadly from 3% to approx. 15%.

Market Needs

In order to align customer needs with Galp Energia goals, Smart Galp arises as an attempt to encourage consumers' openness to change, by providing information, influencing behavior and teaching consumers' new ways to meet their goals through continuous feedback. The desire for control and the willingness to adapt a new behavior and even pay a fee for that capability are mainly influenced by the factor cost[26].

In order to better understand the target for Smart Galp service, and how to reach this target and develop a marketing and sales strategy, a survey among Portuguese consumers was conducted[27].

Sample characteristics

According to the statistical evaluation of the 335 respondents who completed the entire survey regarding consumer preferences for smart meters products and services reveals the following insights: First, 90% of respondents have EDP as their electricity supplier, and only 7% have Galp. Regarding natural gas, the majority of respondents elected Galp as their supplier (55%) and 25% selected EDP. Second, over the past three years more than an half of the surveyed sample could not reduce their spending on electricity, natural gas, and road fuel. Only a minimum percentage could reduce significantly these bills. Third, a great willingness to change behavior exists, 98% of respondents are willing to adjust their behavior regarding energy if it ensures a reduction in electricity and natural gas bills, and consumers considered that it would be valuable to have access to more information on how to reduce consumption, as well as to see consumption in real time in order to adopt such a behavior. Fifth, if through the installation of a smart metering system (solution) of energy (electricity and gas) consumers could reduce the consumption in electricity and natural gas, 96% would install it, and 75% are willing to pay monthly for such a service.

Sixth, the expected reduction of their monthly bill (70%), and the fact that they can control consumption in real time (47%) are seen as the greatest benefits of smart metering. On the other hand, the main reasons for not acquire it are the fear of the initial cost be too high, and the fact that it is an unknown technology/ service for customers. Seventh, in order to receive more information about smart meters, respondents

[26] 2008 Global Utility Consumer Survey, conducted by IBM
[27] To a better analysis of the survey conducted please consult Appendix 5

elected the webpage of energy suppliers, followed by television, and information leaflets. Also, they rely more on energy saving advice agencies and energy regulators to advise them to choose their operator and service of energy. Regarding the question: If you could purchase a device for your car, which by connecting to a portal on the Internet, would give access to your consumption and recommendations to you to become more a driver more energy efficient, would you get this device?, 63% answered affirmatively, and the main reason to this purchase is the expected reducing of fuel costs (83%).

Additionally, respondents value the possibility of an integrated supply offer of energy (natural gas, electricity and fuel) with 6.69 out of 10, and value the possibility of have a loyalty card that gives discounts and accumulate points on offer with an average value of 6.61 (from 0 to 10, in which 0 means they do not value, and 10 means they value the most). Finally, 77% of respondents are willing to, contractually, set a goal of reducing energy consumption, if when reaching this goal they would be awarded monthly. (Example: sign a contract in which you committed to reduce in 5% your energy consumption comparing with the same period last year).

These findings are corroborated by another consumer survey[28] which counts with 1000 respondents in Portugal, and which has other important insights, such as the fact that Portugal is the least techno-friendly country, indicating lower levels of familiarity with newer energy technologies; Consumers are uncertain about how much they could save on their energy bills, and they thing to do enough already in terms of energy saving; the highest level of support to smart meters arrive from high income earners.

Market segmentation

In order to recognize the existence of customer segments in the Portuguese smart meters market, and based on different customer preferences, a cluster analysis was conducted[29].

This analysis resulted in three clusters, 1, 2, and 3 contained 251, 16, and 68 cases. According to the comparison of these three clusters with different variables, it was possible to characterize the different

[28] Survey conducted by TNS UK, on behalf of Logica and Future Foundation Fieldwork in 2007

[29] Cluster analysis is a useful method to identify customer segments based on different value perceptions (Wiedmann et al. 2009). Consult appendix 6 to detailed information regarding this Cluster Analysis

market segments and find the best target for the Smart Galp Service.

- The Supporters: The first cluster reflects a stereotype of customers who expect great benefits from the use of smart meters. In this case the perceived sacrifices are lower than in the others clusters; therefore is assume that the perceived value of smart meters is higher for this cluster, meaning that the perceived value of smart meter technology is high. This segment is characterized by young customers (almost half of them is less than 35 years), with a high level of formation, in which the majority is prepared to adopt an efficient behavior regarding energy, and more than three quarter sare willing to pay for a service like Smart Galp. Concluding, in this segment people would generally support the adoption of smart meters.

- The Ambiguous: The second cluster, number 2 represents customers who on the one hand expect great benefits, but on the other hand have also huge concerns from the use of smart meters. There are also some specific characteristics in this segment, revealing that one half of customers are aged between 35 and 45 years. Remarkably all the consumers in this segment are willing to change their behavior, adopting a more efficient one, however only 56,3% are prepared to pay for a service that may help them adjusting behaviors.

- The Skeptics: the last cluster, number 3 is categorized by customers who, comparing with *The Ambiguous* segment have also deep concerns from the use of smart meters however do not expect to receive great benefits. This cluster has the lowest value perception of smart meters. Customers of this Cluster are on average older, and the ones that are less likely to adopt an efficient behavior regarding energy use.

Potential of Market Segments

According to the findings of this segmentation, it is common to assume that Smart Galp in order to get customers involved with its service has to incur in different costs per segment. The costs to convince skeptics may be much higher than the ones to convince supporters, therefore a step by step approach may be considered.

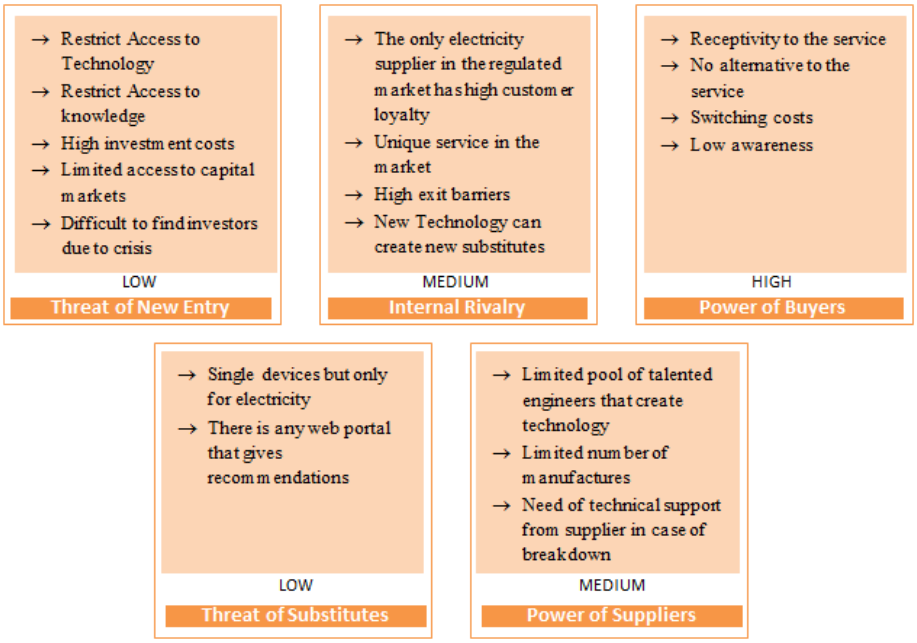
Depended on the segments which are intended to be attracted, Smart Galp may focus on a low cost (e.g. help customers lower their spending, require only low involvement, attracted all segments) driven business

model on the one hand and differentiation (e.g. innovation, require a relatively higher level of involvement from customers, only the Supporters or part of the Ambiguous group will get involved) driven business model on the other hand.

Competitive Strategy

It has been hard to consumers to understand the potential customer value of smart meters technologies. The first step in order to increase market acceptance would be to find an optimal way to communicate value for customer from the technological benefits of smart meters.

Michael Porter's Five Forces



The most powerful stakeholders are the buyers and they are the key driver of Smart Galp business Model. According to the Transaction Cost Theory[30] consumers are not willing to have the extra task of interpret and manage their power consumption unless the payoff is big enough. Besides online feedback to be flexible and less expensive for Smart Galp, it requires engagement and action from the consumer. Therefore, Smart Galp should try to lower the transaction cost for customers through technology and

[30] Developed by Ronald Coase – see Appendix 7 for more information

applications that do not require much physical or intellectual investment from customers, and which are easy to understand, give actionable information and advice, and by using effective communication channels. Moreover, switching costs may be increased through contract management and loyalty initiatives in order to decrease the Power of Buyers.

The internal rivalry, which may decrease its intensity if the focus is on differentiation rather than price, and the power of suppliers, that should be decreased by partnering models and a competitive approach through multi-suppliers and contract management, have a medium intensity and the threat of new entry as well as the threat of substitution is not considered risky for the business in a medium term.

Implementation Plan

The implementation plan is composed by ten activities with a suggested timeline of two years. The activities recommended are mostly related with marketing, communication, processes, and organizational culture. In the following table are presented all the activities of the implementation plan.

Code	Activity	2013						2014											
		J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
A. 1	Establish Partnerships																		
A. 2	Strategic integration inside company																		
A. 3	Establish price and bundles																		
A. 4	Training																		
A. 5	Align company's structure																		
A. 6	Develop CRM activities																		
A. 7	Create awareness																		
A. 8	Software improvement process																		
A. 9	Implementation CRM Process																		
A. 10	Market Implementation																		

The Twos Analysis[31] supports the competitive strategy and implementation Plan.

Risk Analysis and Contingency Plan

Concerning the inherent risks that this implementation plan could face, there are five important areas that have to be covered, and the most crucial is the risk of possible imitation of the business model by other competitors.

[31] Consult Appendix 8 to see TWOS Analysis

From a detailed analysis of the risks that Smart Galp faces, the need for a contingency planning emerges. In case of imitation of the business model, the contingency strategy to apply is not only to have the first mover advantage, but also to offer a differentiated service, customized to the end consumer.

	Risk Analysis	KPI's	Contingency Plan	Type of Impact/ Nature
Business Model and Partnerships	1. Partners do not accept the partnership agreement or there is high dependency on them 2. Competitors imitate the business model	- Number of agreements - Appearance of similar services	Secure long term contracts with strategic partners Enhance service offering on Smart Galp portal	Medium/ Long Term
Financial	3. Consumers' prospect of recovering the investment is low 4. Lack of liquidity of partners	- Financial forecast of partners	Highlight the expected energy savings of up to 10%	Medium/ Medium term
Operational	5. Inability of the software to support the number of users	- System breakage - Velocity of system	Have a server backup	High/ Short term
Commercial	6. Limited number of consumers	- Number of users	Continuous software development to ensure customer's interest	High/ Medium term
Implementation	7. Marketing campaigns' failure, not raising awareness, motivation and involving users 8. Resistance to change	- Number of users	strong marketing highlighting the energy savings of up to 10%	High/ Medium term

Recommendations

In order to answer the research question of *How to potentiate Smart Galp Business Model?*, some recommendations are presented by branch of the issue tree to fulfill the gaps that may occur during the implementation.

Branch	Area	Recommendation
Market Share	Promotion and Advertising	**Segmentation** Consumers are different and have diverse concerns. Environmental benefits are important to supportrs, while convenience or price is more important for ambiguous or skeptics. Therefore, a one-size-fits-all solution is unlikely to be, and the willingness to pay of different segments may be different and is not considered. I recommend Smart Galp to understand and target each consumer segment with tailor made price/service offerings, through a step by step approach trough the service life-cycle, giving priority in the growth stage to early movers - supporters, since they will speed up the diffusion of innovations through other segments and have a higher perceived value. Therefore, Smart Galp should propose services that offer a value added to customers. .

Market Share	Promotion and Advertising	**Communication** I recommend Smart Galp to have a strategy to involve (engage consumers with smart meters promoting shared values and creating trust) and another to inform customers (provision of general information about risks, benefits and specific information about installation of smart meters). Upstream involvement (during the decision-making process) is important for information processing, and may include demonstrations and public presentations about smart meter, as well as Galp involvement in community events (may serve to build social trust). Downstream communication (after the implementation of smart meters has taken place) can be achieved through the creation of shared value between consumer and Smart Galp, by providing continued information about what smart meters may offer to consumers, to maintain public trust and acceptance in the long-term, through Galp' website, community meetings, and mass media campaigns.
		Marketing The first necessary step is the creation of consumer awareness in order to the public fully understand the opportunities offered by Smart Galp in terms of innovative service, energy saving, sustainability and quality of supply. In order to help users understand the value and the implications of smart meters working and equipment some actions may be taken through an education process, which can be encouraged through educational campaigns, advertisements, advisory services and news media. According to the consumer survey consucted for this research, even environmental concerns being important in influencing people's behaviors, cost came across as the strongest motivator for saving energy. Therefore I recommend a emphasis on the cost savings achievable through Smart Galp in the communication approach. Moreover, consumers look for relevant and directly actionable information and solutions to problems and they therefore tend to rely on organizations that are seen as impartial and specialists in the field rather than relying on what their families, the media, or even their government says. For each consumer segment Smart Galp needs a different strategy approach, since each has precise needs and wants. According to the survey conduct during this study, the segment of 'supporters' tends to prefer to receive information through the webpage of the utility, while the 'ambiguous' and the 'skeptics' prefer advertisement on television and informative brochures. I recommend Smart Galp to send more detailed bills with the information of the new service in order to create awareness between their customers. The cost saving factor is crucial in order to communicate effectively. In order to capture the 'supporters' segment, which are the ones more willing to adopt the service, Smart Galp can opt by direct marketing, through special interest media (magazines, web sites), or interest groups.
		Rewards In order to engage customers, and stimulate the interaction between Galp and customers, rewards are a great option to build customers' loyalty. Rewards may create some value by motivating new customers to try Smart Galp service in the short run, but in the long run they can accelerate the loyalty life cycle. Therefore, Smart Galp must create a system where customers can follow the rewards of loyalty and which motivates them to earn it. The suggestion is to form a ranking with consumers' percentage of savings. The top ten can be rewarded with different options, such us one month free service, road fuel disounts, or duplicate points of 'fast' card.

Market Share	Promotion and Advertising	**CRM Initiatives** CRM is one of the best ways to improve the relationship with customers. Moreover, it is important to nurturing this relationship in a profitable way. In a first phase it is important to engage and get new clients, then create loyalty in order to keep them, and finally try to grow by creating customer satisfaction and value. The following initiatives are expected to have a positive influence in how customers value Smart Galp. - To increase engagement and create long term relationship with supporters, Smart Galp can offer customers delightful moments by creating win-win partnerships. When adheres to the service the customer receive a voucher to spend on one of the partners' offer, and after a year they receive a voucher congratulating them and with the amount saved during the year, that allow them to acquire something from the partners offer. - Create a dialogue with customers through social network engagement; respond to customers' complains; ask for suggestions and feedback. Customers will realize that Smart Galp cares about their level of satisfaction, and Smart Galp can improve the service. - Increase engagement and Customer Satisfaction with supporters through a premium service which reward the top ten consumers according to the ranking established in the portal. The consumer can choose his reward that may be a discount on road fuel, or accumulate points in the loyalty card, that can be converted in multiple offers. This will preserve rentable clients satisfied, engaging the most participating ones, incentive customers to save. - Continuous improvement by understanding customer needs and try to fulfill them According to the data gathered, understand which recommendations consumers need more, informing the client of all the possibilities. Understand consumer's needs and increase the service effectiveness. The consumers' benefits since their needs are fulfilled, and they feel the support from Smart Galp.
	Price	**Price scheme** Clearly, an according to the survey, many respondents are likely to adjust their behaviors once the option is offered to them, and are willing to pay for a service such as the one Smart Galp offers. In order to successfully communicate the added value for the increase of customer perceptiveness, it is crucial to understand and adapt the message to Smart Galp service's characteristics. To do so, Smart Galp must assess the target customer's relative cost of search for information relatively to differentiating attributes of the service and the type of benefits sought, according to monetary or psychological value. Moreover, according to already implemented smart meters in Europe, it was proven that consumers on pre-paid schemes generate more savings[32] through demand response than customers on credit, it also reduces the financial risk for the utility service provider . Accordingly, Smart Galp may think in adopt a pre-paid scheme.
Cost Optimization	Organization & Partnerships	**Organizational Culture** It is essential to not focus only on technology or financials since it does not generate engagement and might fail. On the top of the agenda Smart Galp should put consumer response, in order to avoid the backlash observed in some European programs and to maximize consumer engagement. In order to succesfully make the bridge between a product centric to a customer centric culture, all departments might be aligned and focus on customer retention, offer superior services benefits, pursue long-term vision, and also ensure quality. Therefore, to reinforce the customer centric approach, Smart Galp can allocate to each consumer an account manager, which is evaluated by the level of customer satisfaction, and who monitors the consumption of customers and advises them according to their preferences in order to them extract the most value of the service.

[32] 'Many consumers report it is easier to manage their household budgets with a pre-paid scheme, since they can schedule smaller, more frequent payments, enjoying the freedom to use that money for other needs. Electric utilities using pre-paid program report that many participants gain important knowledge from daily energy use alerts and data, and reduce their electric consumption by as much as 15%. They more easily recognize the correlation between certain activities and the daily time, make more informed decisions, and manage daily energy use better.'- Kevin Hurd, Cuivre River Electric Cooperative

Cost Optimization	Operating Model	**Strategic Partnerships** I recommend Smart Galp to collaborate with third party providers to come up with engaging product/service offerings. A loyalty card should be developed, to allow cross-selling promotions across services. Galp Energia has already the 'fast' card, which consists in a program that rewards consumers loyalty. Consumers only have to accumulate 'fast' points on their card, what happens when one makes a purchase or supply in Galp stations. For a good loyalty strategy it is important to have several benefits for customers that use Smart Galp services, and this can be accomplished through partnerships with other companies. Therefore I advise Smart Galp to integrate their services in this 'fast' card allowing customers to be rewarded for their preference in the procurement of products and services of Galp Energia, through access to bonuses, benefits, and other products and services, both in filling stations, or from third parties entities that participate in the program or are on the list of partners. Moreover these card may allow the consumers to accumulate points with their savings with both electricity and natural gas.
Sources of Competitive Advantage	Web Portal	**Goal Setting and Contests** Leverage social networks may help to motivate consumers through the use of goal setting, and competitions. Consumers value consumption that results in recognition, and social network allows immediate interaction, such as sharing comsumption, which generate reactions. Therefore, the possibility to transform the level of consumer savings into a contest that could be shared on social media, may motivate consumers to set goals and make the effort to achieve them. I suggest Smart Galp to introduce a gaming related to level of savings, reinforcing competition which is proved that may lead to comparison and social contagion that may influence behavior.
	Staff	**Training** All employees who are involving in customer services, may receive training to better advise and help consumers. Smart Galp may invest on specialized manpower that may be necessary to install and maintain the equipment and it services. Moreover Smart Galp should create a brochure with all the information regarding devices, web portal application, mobile/ tablet connections, in order to consumers become aware of all the utilities.

Conclusion

From this research is possible to conclude that market acceptance of Smart Galp by customers can be enhanced through a better fit of the value propositions of the business model with customer segments' value perception, as this leads to higher customer value. Since, historically, consumers are relatively uninvolved with energy, the value created by smart meters is perceived as a relatively low value proposal for consumers. Therefore, a communication approach built on establishing trust through both information and involvement of the public across temporal phases of deployment is necessary to increase public acceptance of smart meters within the portuguese market. Therefore, Galp Energia should direct its efforts on the understanding and improving of consumers' relationship with energy, by keeping transaction costs as low as possible for consumers, making consumer applications user-friendly, and searching for

continuous improvement, in order to be a valuable source of competitive advantage. With customer segmentation, enhace of the service differentiation offer and adequate Advertising and Promotions it is possible to increase the market share and optimize costs, potentiating the Smart Galp business model in the portuguese market.

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• Research and Markets - www.researchandmarkets.com

• Smart Grids European Technology Platform - www.smartgrids.eu

• The economist Intelligence group - www.eiu.com

A Work Project, presented as part of requirements for the Award of a Masters Degree in Management from the NOVA – School of Business and Economics.

BUSINESS MODEL: WHAT SHOULD BE THE STRATEGY USED BY SMART GALP TO IMPLEMENT AND POTENTIATE ITS VALUE PROPOSITION IN THE PORTUGUESE MARKET?

APPENDICES

JOANA CATARINA LUZ GOUVEIA | 1066

A Project carried out on the Field Lab in Entrepreneurial Innovative Ventures, under the supervision of:

Professor Filipe Pamplona Castro Soeiro

3rd June 2013

Appendices

Appendix 1 - Potential of Smart Metering

According to the European Smart Metering Alliance (ESMA), the Definition of Smart Metering has the following features:

• Automatic processing, transfer, management and utilisation of metering data

• Automatic management of meters

• Two-way data communication with meters

• Provides meaningful and timely consumption information to the relevant parties and their systems, including the energy consumer

• Supports services that improve the energy efficiency of the energy consumption and the energy system (generation, transmission, distribution and especially end-use)

The smart metering is an important tool to achieve three main objectives:

1. Reduction of fuel consumption and GHG emissions

a. Reduction of final energy consumption through behavioral change consumption patterns, through positive informative interaction of consumption performed by the user and electricity consumption by controlling remote equipment;

b. Improved modeling of energy production through a combination of price / consumption/ time of final consumer transmitted to the client;

c. Reduction of energy losses promoted by greater amount of information available to distributors;

d. Greater possibility of producing renewable energy via production plans with greater rigor in the expected final consumption, in parallel with the help of behaviors such as demand response.

2. Reduction of final energy cost to the consumer

a. All the reasons mentioned in point 1;

b. Greater dynamic switching between commercial operators;

c. Best price comparison between competing operators;

d. Increased competitiveness in commercialazing;

e. Reduction of costs allocated to traditional meter reading, especially in less populated areas;

f. Better network management;

g. More compatible with models of commitment, type demand response.

3. Improving the service quality of power supply

a. Reduction of complaints from the customer through the implementation of a more descriptive invoice and a greater frequency of consumption count;

b. Improved methods of payment;

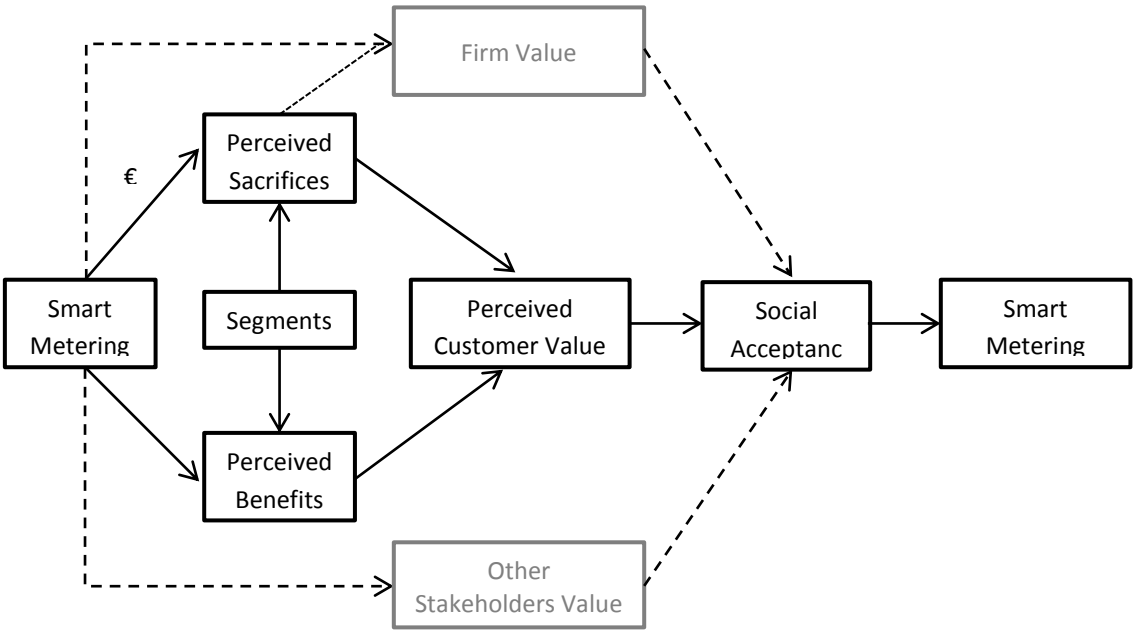
c. More immediate responsiveness regarding geographic location faults in the distribution network;

d. Decrease the occurrences of over voltages in electrical distribution network;

e. Increased capacity of intervention of operator towards missed payments;

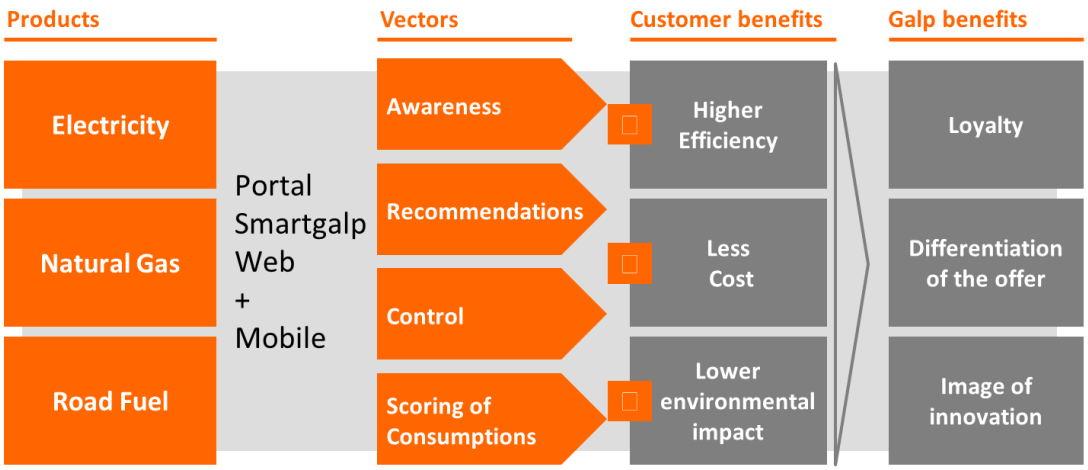
f. Chance of energy management of micro-generation equipment (optional).

Appendix 2 – Value of smart meters



Source: http://www.powerscorecard.org/reduce_energy.cfm

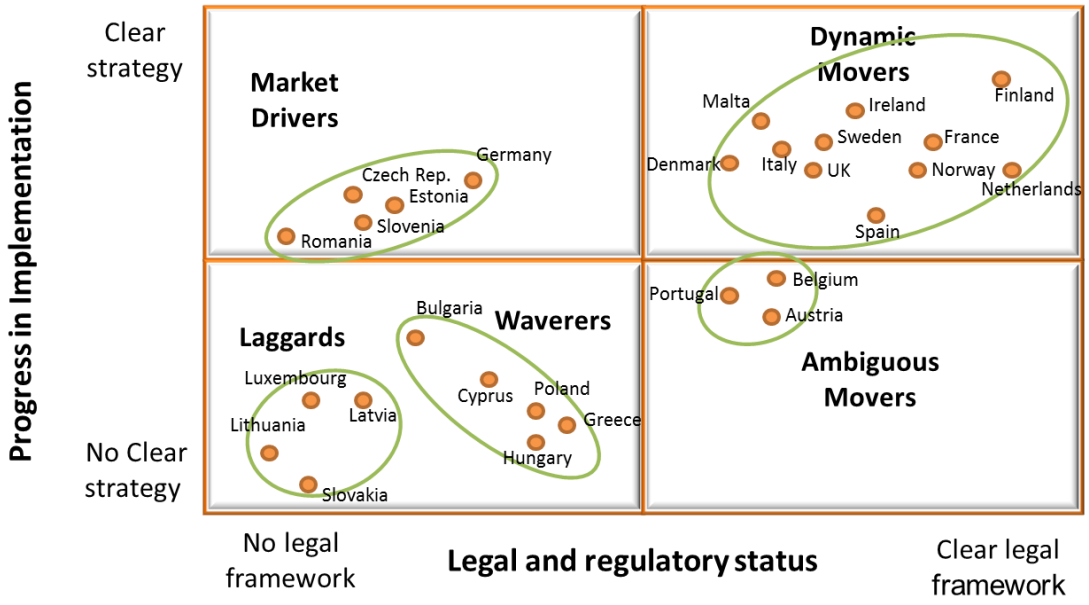
Appendix 3 – Smart Galp service Concept



Appendix 4 – EU situation

Concerning the deployment of intelligent metering systems in EU Member States, although the Third Package sets a common target for it, the development is quite diverse, and different countries are applying different approaches regarding the market model, technologies and objectives.

According to the European Smart Metering Landscape Report (Renner et al., 2011), there are four groups of countries, according to the existence of a legal and regulatory framework and their progress regarding the implementation of smart meters.



"Dynamic movers" are those countries in which the decision for a full smart metering roll-out has already been taken or where major pilot projects are already in place and should result in a mandated roll-out. The countries classified as "market drivers" leave the deployment of smart metering to individual decisions of distribution system operators or suppliers, either because of technical considerations or following customer demands. Portugal is included in the group of "Ambiguous movers". These are the ones where the roll-out has not taken place in general but that have the required framework largely in place. The group of countries that besides the topic of smart metering is already on the agenda but have not yet come to concrete results are considered "Waverers". The set of countries considered "laggards" do have this topic yet under discussion, however they need to make progress in order to accomplish the requirements of the Third Package.

Appendix 5 - Survey Results

The following survey was conducted in Portugal during fifteen days, accessed by internet and only oriented to people who live permanently in Portugal. A sample size of 335 individuals was used in order to investigate to what extent these individuals are reducing consumption, as well as the drivers and blockers for this behavioral change. In particular, the aim of the study looks at the potential role of information as well as the propensity for users to adapt a new technology in facilitating energy saving behavior.

The respondents of this study were 59% women and 41% men, and 13% are aged between 18 24 years old, 29% between 25 to 34 years, and also between 35 to 44 years, 22% are aged between 45 to 55 and 7% have more than 55 years old.

The sample of 335 consumers across the 18 districts of Portugal (excluding islands) has more weight in the main regions of Lisbon and Oporto (41%), and the remaining respondents are equally represented by the others districts to ensure accurate representation.

In what concerns academic qualifications, 34% completed high school or attended a professional course, 47% have a bachelor, and the remaining 19% have a masters or doctorate.

Questions:

1. Monthly net income of the households

Answer		Response	%
< 750€		29	9%
750€ – 1500€		115	34%
1500€ – 2500€		104	31%
2500€ – 3500€		48	14%
3500€ – 4500€		24	7%
>4500€		15	4%
Total		335	100%

2. Number of household members

Answer		Response	%
1		67	20%
2		78	23%
3		96	29%
4		71	21%
5		21	6%
>5		2	1%
Total		335	100%

3. Internet access at home

Answer		Response	%
Yes		322	96%
No		13	4%
Total		335	100%

4. Own any of the following equipment

Answer		Response	%
Smart Phone		120	36%
iphone		52	16%
Tablet		63	19%
ipad		49	15%
Do not own any		130	39%

5. What is the monthly value of the expense of electricity in your home?

Answer		Response	%
< 55€		85	25%
55€ - 70€		109	33%
70€ - 85€		47	14%
85€ - 100€		40	12%
100€-115€		28	8%
115€-130€		11	3%
130€-145€		5	1%
145€-160€		2	1%
>160€		8	2%
Total		335	100%

6. What is your electricity supplier?

Answer		Response	%
EDP		303	90%
EGL Energía Iberia		0	0%
Endesa		3	1%
Galp Energia		23	7%
Iberdrola		4	1%
Gas Natural Fenosa		0	0%
Nexus Energia		1	0%
Outro		1	0%
Total		335	100%

7. Do you use natural gas in your residence?

Answer		Response	%
Yes		179	53%
No		156	47%
Total		335	100%

8. What is the monthly value of spending on natural gas in your home?

Answer		Response	%
< 15€		16	9%
15€ - 25€		68	38%
25€ - 35€		44	25%
35€ - 45€		25	14%
> 45€		25	14%
Total		178	100%

9. What is your natural gas supplier?

Answer		Response	%
EDP		44	25%
Endesa		0	0%
Galp Energia		98	55%
Gas Natural Fenosa		0	0%
Goldenergy		5	3%
Iberdrola		2	1%
IncryGas		0	0%
Molgás, Energia Portugal		0	0%
Outro		29	16%
Total		178	100%

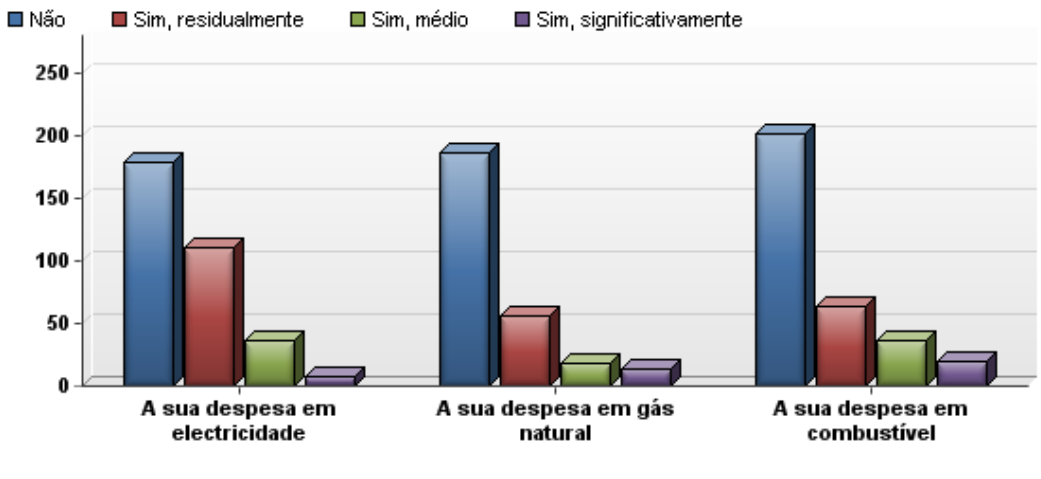
10. Have at least one car in your own household?

Answer		Response	%
Yes		318	95%
No		17	5%
Total		335	100%

11. What is the monthly value of the expenditure on fuel per vehicle?

Answer		Response	%
0€ - 30€		11	3%
30€ - 60€		68	21%
60€ - 90€		87	27%
90€ - 120€		67	21%
120€ - 150€		44	14%
150€ - 180€		20	6%
> 180€		20	6%
Total		317	100%

12. Over the past three years could you reduce your spending on electricity, natural gas, and road fuel?



13. If through the installation of a smart metering system (solution) of energy (electricity and gas) you could reduce the consumption in electricity and natural gas would you do it?

Answer		Response	%
Yes		323	96%
No		12	4%
Total		335	100%

14. Are you willing to pay monthly for a service with an intelligent system (price of service includes all equipment and installation)?

Answer		Response	%
Yes		251	75%
No		84	25%
Total		335	100%

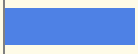
15. Are you willing to adjust your behavior regarding energy if it ensures a reduction in electricity and natural gas bills?

Answer		Response	%
Yes		328	98%
No		7	2%
Total		335	100%

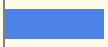
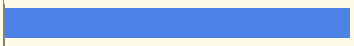
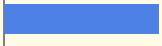
16. Select the factors that are most important for you to adopt an efficient behavior regarding: (3 options at most)

Answer		Response	%
Have access to more information on how to reduce consumption		189	56%
See consumption in real time		204	61%
Be able to compare my consumption with other users of the same category		74	22%
Be given to me recommendations		127	38%
Control my household appliances remotely		75	22%
Receive a detailed invoice		121	36%
Show deviations from the objectives set by me		107	32%

17. Consider that you can choose to purchase a smart meter for electricity and / or natural gas, which would allow you to see in real time their consumption through a web portal. What reasons would lead you to acquire it?

Answer		Response	%
Would not acquire		35	10%
Could control in real time my consumption		159	47%
Know what is my average compared to other similar consumers		37	11%
Could receive notifications via email and phone		75	22%
Could control my equipment through the phone / tablet / ipad		70	21%
Could reduce the amount of my monthly bill		235	70%
Would help the environment, as I would control my behavior		106	32%

18. What factors would lead you to not purchase a service like this? (3 options at most)

Answer		Response	%
Being a new service on the market, with no history of use		81	24%
Be afraid of privacy of information collected		77	23%
Have a high initial cost		279	83%
Not having enough information about the new technology		122	36%
Not having enough information about product features		125	37%
I think I do enough to reduce my energy consumption		22	7%
Have no incentive to do		54	16%

19. How would like to receive more information about smart meters? (3 options at most)

Answer		Response	%
Television		169	50%
Webpage of energy suppliers		217	65%
Webpage of government organs		74	22%
Call Center		16	5%
Information leaflets		168	50%
Mobile phone		79	24%

20. In which people or organizations you rely more to advise you to choose your operator and service of energy? (3 options at most)

Answer		Response	%
Energy saving advice agency		185	55%
Energy regulators		135	40%
Family		93	28%
Internet search		96	29%
Energy suppliers		74	22%
Government		24	7%
Environmental charity/lobby group		114	34%
Media		70	21%

21. Do you usually use the simulators from DECO / ERSE to see which operator best suited to your reality?

Answer		Response	%
Yes		134	40%
No		201	60%
Total		335	100%

22. If you could purchase a device for your car, which by connecting to a portal on the Internet, would give access to your consumption and recommendations to you to become more a driver more energy efficient, would you get this device?

Answer		Response	%
Yes		211	63%
No		124	37%
Total		335	100%

23. What reasons would lead you to acquire a device like this?

Answer		Response	%
It would help to reduce fuel costs		226	83%
Allow me to reduce CO2 emissions to the environment		79	29%
Would help me to have a more efficient driving, wearing the car less		91	33%

24. How do you value the possibility of an integrated supply offer of energy (natural gas, electricity and fuel)? From 0 to 10, in which 0 means you do not value, and 10 means you value the most.

Min Value	Max Value	Average Value	Standard Deviation	Responses
0.00	10.00	6.69	2.25	335

25. How do you value the possibility of have a loyalty card that gives discounts and accumulate points on offer? From 0 to 10, in which 0 means you do not value, and 10 means you value the most.

Min Value	Max Value	Average Value	Standard Deviation	Responses
0.00	10.00	6.61	2.62	335

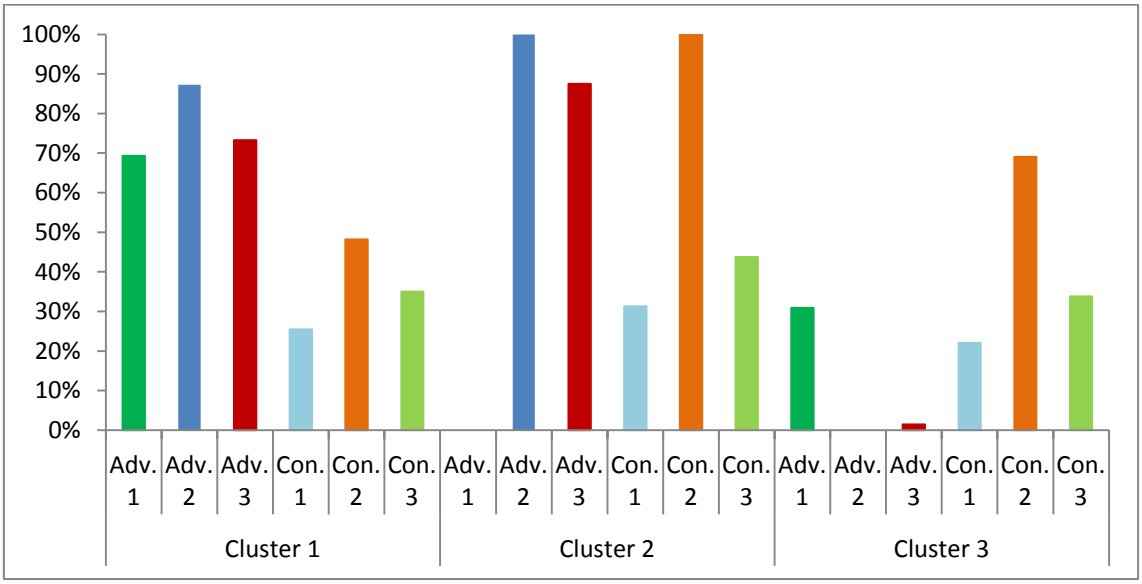
26. Would you be willing to, contractually, set a goal of reducing energy consumption, if when reaching this goal you would be awarded monthly? (Example: sign a contract in which you committed to reduce in 5% your energy consumption comparing with the same period last year).

Answer		Response	%
Yes		258	77%
No		77	23%
Total		335	100%

Appendix 6 - Cluster Analysis

The Cluster analysis presented in this report is based on six questions posed in the survey, three of them regarding benefits and the remaining three regarding concerns to the use of smart meters (the table below represents the six items selected for the cluster analysis).

Advantage 1 (Adv. 1)	Could control in real time my consumption
Advantage 2 (Adv. 2)	Could reduce the amount of my monthly bill
Advantage 3 (Adv. 3)	Would help the environment, as I would control my behavior
Concern 1 (Con. 1)	Be afraid of privacy of information collected
Concern 2 (Con. 2)	Have a high initial cost
Concern 3 (Con. 3)	Not having enough information about the new technology



The choice of these items was based on two different reasons. According to experts, previous studies, and literature, these items are considered as most important (Faruqui et al. 2009; Forsa 2010; Kranz et al. 2010; Strategier et al. 2010). Secondly, evaluating the results from the survey the majority represented the highest perceived benefits and concerns.

In order to conduct the Cluster analysis I used SPSS to compute a hierarchical clustering (this technique is consistently more accurate than others in grouping items of a given population (Backhaus et al. 2003)).

Appendix 7 - Applying the Transaction Cost Theory to individual smart grid consumers:

1. Faced with the uncertainty of a new technology or new tasks, consumers will outsource production (in the case of smart grid: demand response decision making) if the perceived benefit of internalizing the production or decision-making process is lower than the internal transaction cost. It is therefore interesting for utilities to find out for each type of consumer what the potential benefits of smart grid technology are to this consumer, what the perceived transaction cost to her/him is and design product/service offerings tailored to specific client segments.

2. Consumers have historically been unengaged with electricity. Unless the payoff is high enough, consumers do not want the extra task of having to interpret and digest information and actively manage their power consumption. This was shown in recent surveys in the UK (The Economist Intelligence Unit, 2011) and USA (Gohn, 2010).

3. Lowering transaction costs, which could be done through education, access to relevant information and instructions, and facilitating technology and devices, will increase consumer engagement. However, because of the limited cognitive ability described above, some demand response potential might be lost. This would be an argument in favor of developing technology that would take over the decision making for consumers, thus minimizing the issue of transaction costs to the largest extent possible, in line with Jung (2011), who argues that "a truely smart grid should require as little consumer participation as possible".

Appendix 8 - TWOS Analysis

In order to deeply understand and potentiate the opportunities as well as to mitigate the risks in the Portuguese market, it is essential to conduct a TWOS analysis. From this analysis one of the main conclusions is that Smart Galp is a service with huge potential that promote an active role of customer in energy consumption. Strategic combinations as SO and WO would be the major guidelines for the Implementation Plan, like become the high-quality energy leader, gain market share and increase brand

reputation, while ST and WT for the Risk Assessment, such as invest in customer relationship management to secure market share.

	Strength	**Weakness**
	• Tri-Fuel offer • High quality of P&S • Strong partnerships • Close relationship with customers • Detailed data regarding target • Environmental friendly approach	• Lack of experience & knowledge • Issues regarding internal commuinication flow • Limited market share • Remaining un-aligned processes due to aquisition of electricity division
Opportunities	**S-O Strategy**	**W-O Strategy**
• Geographical expansion • Market gap for environmental friendly energy provider • Technological development	• Investment in technological novelties (Improve process) • Become high-quality energy leader • Gain market share through integrated P&S	• Invest in Strategic Partnerships • Growth in sales due to a larger market • Increase reputation and brand image through communication
Threats	**S-T Strategy**	**W-T Strategy**
• Due to Market Liberalization: - Increased competitive environment - Increased bargaining power of customers - Potential loss of market share - Increase pressure to innovate services	• Strong positioning of tri-fuel offer reliefs competitive pressure • Investment in innovative projects (diversification) • Good understranding of the market through advanced data analysis	• Customer Relationship management to secure market share • Strategic alliences with competitors • Unaligned human resources (Strategic Integration inside company)

A Work Project, presented as part of requirements for the Award of a Masters Degree in Management from the NOVA – School of Business and Economics.

BUSINESS MODEL: WHAT SHOULD BE THE STRATEGY USED BY SMART GALP TO IMPLEMENT AND POTENTIATE ITS VALUE PROPOSITION IN THE PORTUGUESE MARKET?

JOANA CATARINA LUZ GOUVEIA | 1066

A Project carried out on the Field Lab in Entrepreneurial Innovative Ventures, under the supervision of:

Professor Filipe Pamplona Castro Soeiro

3rd June 2013

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Executive Summary

For a long period, energy has been seen as an invisible good. In the users' mind, choices and costs related to energy are not connected. However, for consumers to change their behavior these two may be connected and consumers should become aware of the consequences of their actions and motivated to adjust them. Through the development of Smart meters, the next generation of gas and electricity meters which offer a range of intelligent functions and provide consumers with more accurate information, Galp Energia created Smart Galp - a revolutionary service that allows the consumer to control, monitor and influence the energy consumption of his household and automobile.

This work project studies the best strategy to implement and potentiate Smart Galp value proposition in the Portuguese Market. The objective is to launch the service in the market. Thus, after all the internal and external analysis, it was defined the business model and the competitive strategy. A risk assessment and recommendations were conducted in order to achieve a successful implementation.

Key words: Innovation in the energy sector; Energy Market Needs; Energy Efficiency, Smart Meters; Tri-fuel Offer; Implementation in the market; Communication and Marketing of Smart Meters

Literature Review

Consumers' awareness regarding the climate change challenges is high[1], mainly due to the intensive media exposure; however it has been hard to translate it into a sustainable and efficient behavior regarding energy[2]. Specific actions to reduce energy consumption may lead not only to the reduction of carbon emissions, but it may also mean significant cost savings for both consumers and companies involved[3].

Technologies of meter electricity and natural gas used to have as priority an operational readout system,

[1] According to a study provided by OCDE in 2011 – Industrial Biotechnology and Climate Change, Opportunities and Challenges 'Consumers are increasingly making purchasing decisions based on environmental considerations.'

[2] 'As many surveys over the past couple of years have shown, there are an increasing number of consumers who are concerned about climate change and who say they are willing to make changes in their purchasing and lifestyle choices. However, when looking at actual consumer behavior, it is clear that actions have yet to catch up with the level of concern.', from AccountAbility - What Assures Consumers on Climate Change?, 2007

[3] In accordance with a Power scorecard study, conserving energy, by taking actions like insulating/weather-stripping your home and purchasing Energy Star certified (high efficiency) appliances, is usually an economical and environmental action since it minimizes the energy needed, meaning less burning of fossil fuels which also means lower emissions of carbon dioxide (CO2).

reliable and inexpensive. However, these systems are very limited in providing information, since they only allow the transmission of discrete information and require human intervention for its reading. This has implications on the provision of information for the customer, representing constraints that hinder decision making timely. This entails consequences in terms of households not optimizing consumption of both electricity and gas. Therefore, a new generation of energy meters called smart meters has been developed. Smart Meter is an intelligent meter that can be read remotely. It does automatic reading, processing and transmission of metering data, telling exactly how much energy is being used at home at any single moment, and showing how the amount of energy used changes through the day[4] (Energy Community Secretariat, 2012). However, smart metering technologies regarding energy efficiency, and in specific their articulation with behavior changes, are currently in a phase of investigation and development. Therefore, they are considered an area with huge potential[5] in the world context of climate changes.

Moreover, the observable trend of a substantial price reduction of this type of equipment prospects in a nearly future their generalized installation with a positive cost-benefit. However, public acceptance of utility programs and initiatives such as smart meters development is crucial for their deployment. Only 10% of the world's meters are considered "smart", however it is expected this number to change drastically during the next years (Karlin, 2012)[6].

Mainly due to consumers' experiences in other industries (like media and entertainment) where they have an active role, they are willing to be more involved and assume a dynamic part regarding energy and associated technology (IBM, 2007). Moreover, connected devices, such as laptops, mobile phones and tablets are changing customers' experience and have become a way of life for many, increasing customer interface solutions (Rigby, 2011; Deloitte Research, 2011). Smart meters open a new perspective of relationship with consumers' choice, potentiating an active role of consumers in energy efficiency. The

[4] This will help to understand how much the energy use is costing and will give information to support consumers in becoming more energy efficient due to the bidirectional data communication in real time (Energy Community Secretariat, 2012).
[5] Consult appendix 1 to see the potential of Smart Meters
[6] Public Acceptance of Smart Meters: Integrating Psychology and Practice, Beth Karlin, University of California, Irvine, 2012 ACEEE Summer Study on Energy Efficiency in Buildings

development of mechanisms of interaction with consumers' choices is extremely important. Especially in times where, in the top of energy's politics priorities we can find energy efficiency due to the increase of energy costs and its impact on the climate. According to the National Action Plan to Energy Efficiency (PNAEE), ENE 2020 aims to reduce the final energy consumption in 20% by the end of 2020.

However, there is a trend to the raise of energy consumption by the households. The weight of energy services in the total domestic consumption increased from 28% in 1996 to 43% in 2010 (INE/DGEG, 2011).[7] Therefore, if consumers can access to detailed information regarding the way and the timeframe they spend energy, as well as the costs and environmental impact of their spending, they are allowed to assume a more active role in energy efficiency (Thorne et al. 2006). The role of feedback is to make the consumption of energy visible, providing consumers the opportunity to have information more directly, in some cases following online detailed communication of information and data, comparable and comprehensive about energy consumption pattern, leading to a change of energy behavior (Darby 2006).

Smart Metering is considered within Europe and indeed globally, as a key building block in the smart grid and the most cost/effective method for increasing end-consumer engagement and involvement (Sromback et al, 2011).

Several studies (Ehrhardt-Martinez et al., 2010; Darby, 2006; EPRI, 2009) point that with the change of consumers' habits, there is a 10% potential decrease in energy consumption (Galp, 2010). Savings can be higher if consumers take advantage of more economic tariff periods, so that system demand peaks can be reduced. However, consumers' typically adopt new technologies only after they become sufficiently mature, which is faster when there are pressure exerted by public policies and R&D support (Capros et al, 2010). Yet, if they have the guarantee that by adopting new technologies they will reduce the cost associated with energy services, they will not hesitate (Capros et al, 2010).

[7] The total monthly spending by household is, on average, 193€ by house, including spending on vehicles, which corresponds to 121€ per one vehicle (Galp 2011), electricity emerges as the second main source of energy consumed in households, representing 50€, and natural gas represents the remaining 22€ of the total energy expenditure (ERSE 2011).

Aim and Scope of the work project

The aim of this work project is the development of a strategy to implement and potentiate Smart Galp[8] value proposition in the Portuguese Market. Galp Energia aims to position its brand as the number one according to consumers' preferences[9]. In order to achieve such an ambitious goal, the company intends to establish a strong relationship with its customers, offering them an added value service. Therefore Galp is constantly looking for solutions regarding energy efficiency.

In order to foster energy efficiency, Galp Energia developed the Smart Galp Program, which consists in a user-friendly energy management system that allows the consumer to control, monitor and influence the energy consumption of his household (electricity, natural gas, and road fuel). It is a service based on the development of a tri-fuel commercial portal, where Galp Energia interacts with its domestic customers, promoting an energy search management.

Currently in the trial phase, it is important to think beyond and understand the best strategy to engage and involve customers into this new service, in accordance with a segmentation marketing strategy. It is essential to identify correctly the target audience and the strategies to communicate to this target.

The research question to this work project is: *What should be the strategy used by Smart Galp to implement and potentiate its value proposition in the Portuguese Market?* To answer this research question, other sub-questions have to be analyzed: *What is the biggest challenge in the energy industry?, How to solve it?, What are the key issues to consider when implementing the Smart Galp Project?, How is the Portuguese energy market?, What are the sources of competitive advantage of Smart Galp?, How these ones can be potentiate within the implementation in the market?, What do Portuguese customers want in the energy context?, How can Smart Galp align its services with costumers' preferences?,* and

[8] The Smart Galp project is an innovative action of Galp Energia in the energy market. It is a service based on the development of a tri-fuel commercial portal of integration with domestic customers of electricity, natural gas, and road fuel. The project is based on an integrated system of intelligent devices, which have behavior inducing solutions for energy saving and a more efficient modeling of energy consumption.

[9] Currently, at the customers' eyes, the brand image is consistent with its position. Galp Energia brand is one of the few brands' in Portugal with a total reputation close to 100% - specifically 96% - and with a mind awareness of 54%. In 2011, for the ninth year running, Galp Energia was voted a "Trusted Brand", totaling 61% of the votes in its category. The brand also achieved high results on its attributes, reaching the first place in Quality, Cost-Effectiveness, Image and Perception of customers' needs.

What measures are necessary to build customer loyalty?. Moreover an issue tree was created (figure 1), and three main branches were identified, namely: market share, cost optimization and sources of competitive advantage. Through these branches, a strategy will be recommended.

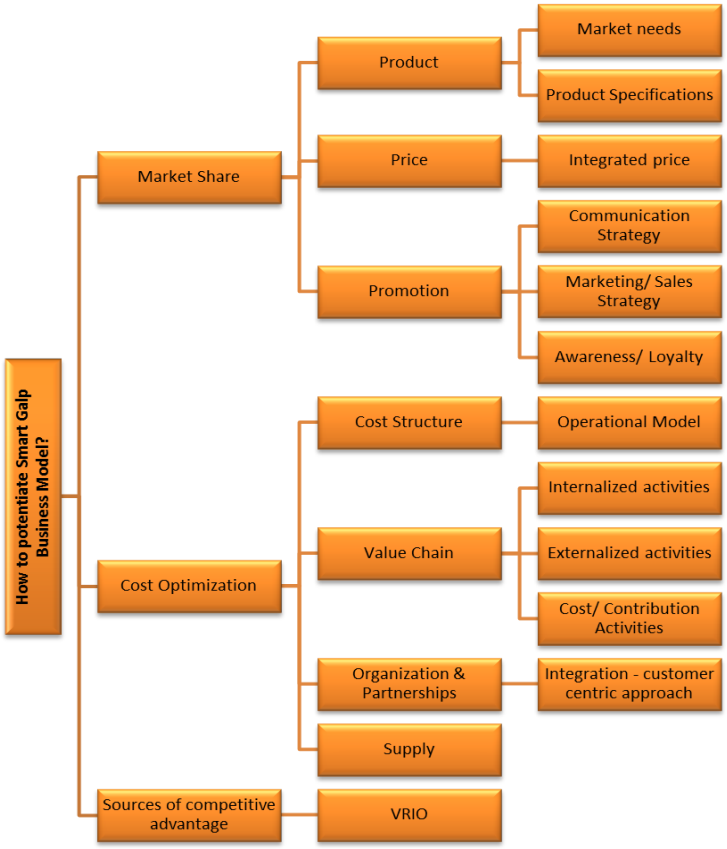

Figure 1: Issue Tree

Market liberalization and challenges of the industry

In compliance with the Directive number 2003/54/CE, since September, 2006, all the consumers in Portugal can freely choose their electricity supplier. However, regulated tariffs for sale of electricity and natural gas to end customers only ended up at 2012. Associated with the energy market liberalization, there is expected an increase of competition. Therefore, the final consumers of residential energy search for several conditions in this service, namely a better quality of services provided, and offers with differentiated prices, which allows them to improve life standards in their residences and consumer behaviors.

According to Kowsary and Zerrifi (2011) there are different variables that affect the decision of the energy supplier, endogenous factors that depend on the residence characteristics (family income to energy

consumptions habits, typology and area of the house, households' age, level of education and access to information, as well as life style and social status) and exogenous factors (location, climate, market conditions, energy politics, price, accessibility, operational complexity). The choice is extremely complex since it inter-related economic, social and cultural rights with the physical environment of housing. This is especially relevant in the case of Galp, since, according to Mills and Schleich (2012), Portugal is the European country where the education level has more influence on concerns about energy saving in housing, and concern about emissions of greenhouse gases and the presence of children in the household were also variables that make the Portuguese households save energy.

Regarding opportunities to the adoption of smart meters, the economic crisis aligned with the unstable political situation, and consequent reduction of purchasing power makes energy to be used more consciously (Banco de Portugal, 2012). Moreover the increasing ease of transmitting information, introduced with the so-called Web 2.0 allows disseminate information so affordable, quick and easy.

However there are some weaknesses that should be highlighted. The increasingly aging population in the country (Rosa, 2012), despite being a reflection of important social advances, causes a greater percentage of people to be resistant to change and not regard with favor investments without immediate payback period. Additionally, the complexity of the rules and laws in vigor in the country and the lack of celerity of the judicial system, in Portugal, also make it more difficult for citizens to accept innovations in this area, since they do not feel their investments safeguarded (Rego, Sarrico, & Moreira, 2006). The insufficient monitoring of compliance with legislation in vigor does not encourage the fulfillment of new requirements and measures proposed. The diversity of the residential sector in Portugal and all the variables that affect consumption and savings are a weak point that can be seen as a challenge.

The threats to the implementation of new ideas that foster energy savings pass by difficult access to credit, the natural resistance to change, lack of medium-term strategy for the energy sector, and also some technical barriers such as the lack of standardization, the limited number of manufacturers offering smart metering hardware, and the absence of economies of scale. The volatility of energy markets and energy

prices makes the threat of an energy crisis that encourages the adoption of energy-saving measures that serve to reduce the risk associated with the energy dependence (Ruiz, Guillamón, & Gabaldon, 2012).

In accordance with McMakin et al (2002), people become more receptive to adopt behaviors conducive to an efficient use of energy in three situations: When there is a direct benefit for them (eg, increased comfort and lower costs); If they have the opportunity to monitor their own consumption; If they have easy access to information relevant to the adoption of better behavior in terms of energy use.

Moreover, Stern (2011) claims that it is essential to give a financial incentive to those who invest in energy efficiency. A direct incentive for investment in efficiency makes the choice logic and economically feasible, while at the same time, the consumer feels that his conduct is enhanced by receiving a "prize".

Energy is consumed as an invisible product, therefore, as it is never the focus of the activities where people use it, customers are unaware of the direct impact an activity has on their consumption levels. The consumer mind does not connect the activity done to the cost of energy, and this is a barrier to successful energy saving and other efficiency programs (Darby 2006, Stromback 2010, Mourik 2009). Consequently, consumers must become aware of the consequences of their actions and motivated to adjust them. Social acceptance is a requirement for an effective implementation and diffusion of smart meter technology and related services (Wüstenhagen et al., 2007 and Wolsink, 2012). Therefore it is important to assure that the most powerful stakeholder – consumers, maximize their value. Zeithaml (1988) and Sheth et al. (1991) defend that only if customer-perceived benefits of smart metering surpass the perceived drawbacks, consumes will perceive a positive value and then be willing to pay for a service. However, according to customers' perspective, price is a sacrifice that reduces perceived benefits.[10]

There are two critical points that should be considered when a utility decide to provide a service with smart meters. Firstly, this service has to provide more benefits than perceived drawbacks to customers, since this is the only way that there is willingness-to-pay (Zeithaml, 1988). Secondly, instead of set the price with a cost plus method, it should be set based on an assessment of customers' willingness-to-pay to ensure a

[10] Consult appendix 2 to see a visualization of the value of Smart Meters for stakeholders

positive customer perceived value that would lead to customer acceptance and purchase.

Concluding, to guarantee market acceptance, the customer-perceived benefits of smart metering (consumption and cost reduction, home appliances' automation, convenience, between others) must exceed the perceived drawbacks (such as price, clarity of information, or resistance to change)[11].

Methodology

Throughout this work project, in order to propose a Business Model to Smart Galp, the approach followed starts with a better understand of the company itself, and a deep analysis of Smart Galp Project. Then the resources and capabilities available within this new service are studied and analyzed to understand how these resources can be leveraged in order to create a sustainable competitive advantage for Galp Energia. Moreover an International Benchmark, Competitive Assessment, SOWT/TOWS, and a Porter Analysis are conducted. The access to literature review (research papers, books and research studies covering the theme of smart meters development and implementation), as well as the semi-structured interviews with energy regulators allow to propose a strategy to implement and potentiate Smart Galp value proposition in the Portuguese Market. Moreover, the opinion of a sample of Portuguese consumers is also considered in order to determine the best approach to this implementation, completing a 360 degree analysis. Finally it is relevant to suggest a risk assessment and detailed recommendations to support the strategy developed.

Firm Description

Business Opportunity

Technological advances in equipment and construction elements have been made possible to obtain the same quality of life with less energy consumed, and consequently more efficiently.

The energy sector is undergoing constant changes in Europe, and more concretely in Portugal[12], requiring solutions which are innovative and technologically sustainable in environmental terms. European

[11] Since there is a market potential, this is possible to achieve if there is a segmentation of the target audience, capturing firstly the innovators and early adopters who are more likely to try new things.

legislation also calls for energy efficiency[13], there are inclusively a number of key EU legislative instruments promoting smart metering in order to enable consumers to regulate their energy consumption through properly information of actual energy consumption and costs. There is not an ideal receipt to save energy in a residence. The ideal is to use an integrated approach, which includes equipment change and behavior change. Following these drivers (need for efficiency, active role for customers, and innovation and differentiated services offers), in 2011, Galp Energia[14] installed the necessary equipment on 120 pilot-customers and developed all information systems, required to support the project, in partnership with ISA, Logica and MIT Portugal. The Smart Galp solution will simultaneously promote an energy search management and the creation of innovative ways of commercial interaction with potential customers. At home or in the car, the project is based on an integrated system of intelligent devices, which have behavior inducing solutions for energy saving and a more efficient modeling of energy consumption. Summarizing, in order to ensure future growth, and once energy resources are limited, Galp Energia recognized the need to innovate with Smart Galp.

Services offered

The Smart Galp service includes the installation of measuring equipment for continuous consumption, transmission and processing data in real time, provision of information online, compare individual data regarding consumption with standardized values that constitute a reference to achieve, accurate determination of CO2 footprint associated with energy consumption, and systematic generation of recommendations for changes in consumption patterns, all in an integrated form in order to reduce energy consumption and associated costs, and shift any discretionary energy usage away from peak consumption times.

[12] Concerning Portugal, ENE[12] 2020 aims to reduce the final energy consumption in 10% until 2015, and 20% by the end of 2020. Moreover, since the beginning of 2013 all the consumers in Portugal can freely choose their supplier of electricity and natural gas, opening the competition between operators.

[13] All Member States of the EU are required to install by 2020 intelligent metering systems for electricity consumption for at least 80% of customers.

[14] Galp Energia was created in 1999 from the merger, acquisition and integration of several companies in different times, and is now an integrated multi-energy operator, present in all stages of the oil, natural gas and electricity value chain. It is the only Iberian operator to produce and market all forms of energy, offering a range of products and services that meet consumers' needs for mobility, comfort and efficiency.

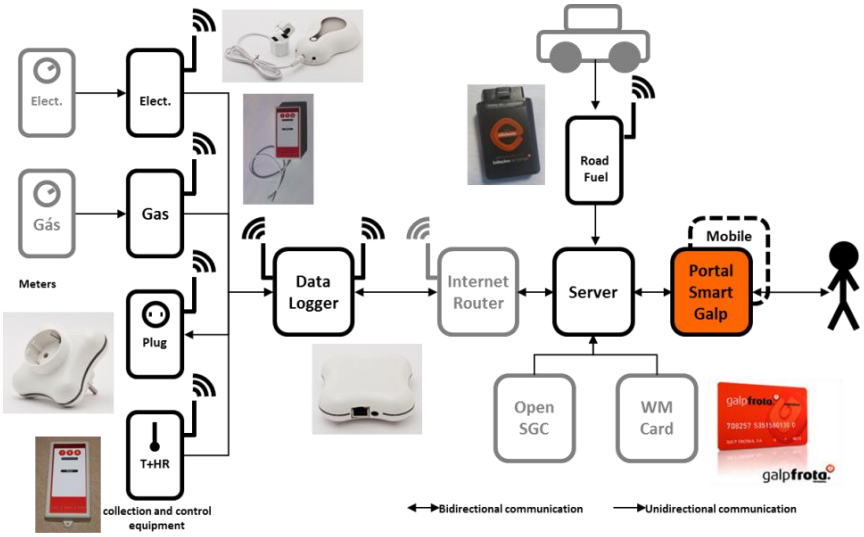

Figure 2: Service Operation Model

Through Smart Galp service the consumer can include three products: electricity, natural gas and road fuel, and are given to the consumer the possibility to have an active role and be the major player in this service due to the creation of a web portal and a mobile application. By electing this service, it is given the opportunity, through the installation of smart meters and the use of a digital platform and mobile app, to:

Awareness	Detail view by energy: consumption history, notifications, invoicing, time periods and events
Recommendations	Implement opportunities for improvement suggested by the system
Control	Control equipment in real-time (measuring consumption of individual devices and schedule their operating)
Score consumptions	Score their consumptions (Relative Indicator: establishes a ranking of energy efficiency, allows users to compare its consumptions with other users)

Doing this the consumer can benefit by use energy more efficiently, reduce costs, and have a lower environmental impact. Since this is a win-win situation, Galp Energia will also benefit by being associated to an image of innovation, being the operator that offers a differentiated offer and building loyalty with customers[15].

Mission, Vision and Strategic Objectives

The project's mission is to deliver to customers the potential of improving energy efficiency in the residential environment. To this end Galp intend to develop an integrated interface with the end user,

[15] The concept of this tri-fuel service is explained in Appendix 3

supported a package of equipment installed in the homes of end users, enabling instill behavioral changes in terms of energy savings, more efficient modeling of energy consumption and test new models of relationship between the energy supplier and the customer, in the current context of major technological breakthrough. Through this program, Smart Galp will verify which are the consumer's profile that can achieve higher impact, to afterwards target consumers which benefits surpass investment costs. With its implementation Galp Energia visions to be the number one energy operator in Portugal according to consumers' preferences within 3 years. According to the research question, there are some strategic objectives that are essential for the success of the implementation of this service. These are defined by area, and are expected to be gradually implemented in a three years' timeline. In the table below the objectives are presented with KPI's[16] to monitor their efficiency

Area	Objective	KPI's
Organizational	- Be a solution regarding energy efficiency - Implement a customer centric culture - Have the highest market share in energy integrated services in 2015	- Customer satisfaction - Market share
Marketing	- Develop and implement marketing strategies to increase brand awareness - Develop and implement loyalty strategies to increase value and retain customers	- Brand awareness - Sales revenues - Customer satisfaction
Communication	- Customize communication for customers	- Campaigns efficiency
Operations	- Decrease operations/ distribution costs in 10% in 2015 - Launch market version in September 2014 - Improve services quality	- Customer satisfaction - Internal cost efficiency
Customers	- Consumption and cost reduction[17] - Provide all consumers with accurate monthly invoices rather than estimated invoices - Assure a level of innovation correspondent to the market and consumers needs - Improve data related to the target	- Customer satisfaction - Sales revenues

Business Model

Considering the reduction schemes of energy, smart metering can provide the foundation for a completely different approach in this regard. Nevertheless, the success of smart metering implementation depends on

[16] Key Performance Indicators
[17] Conducting a study with 120 residential-trials, it is expected a 5% reduction in energy consumption (quantity effect), and sustained savings to households, about 10% (quantity and price effect).

various factors, since how to present the information to domestic consumers to the right technology choice. Assuming a customer centric approach, a business model is presented, which will be validated and improved through specific recommendations.

Value Proposition

The implementation of Smart Galp is not a technological issue alone, since it also requires social acceptance by various stakeholders, and thus a marketing and communication strategy. The value proposition is extremely important to ensure the right value is communicated to customers in a consistent way. One of the most important key drivers for competitive advantage and economic value creation is customer value (DeSarbo et al. 2001; Porter 1985). The objective of Smart Galp is to deliver to customers the potential of improving energy efficiency in the residential environment. Therefore a B2C business model is applied and the whole strategy is defined for the final customer. Smart Galp value proposition for consumers is:

– More accurate and frequent billing

– Cost reduction by better insight into consumption

– Ability to switch significant consumption to less expensive hours

– Intelligent load management as a consumer / home automation

Revenue Structure

By investing in smart meters technology, the revenue model must be aligned with the expected benefits and provide assurance of return. It is important to note that the success of this service may lead to an efficient energy use that will reduce throughput. It appears that Galp is investing to reduce its own revenue. However with Smart Galp, the company is rewarded for its success in delivering an added value service, providing the capacity to avoid network congestion. Networks are expected to operate more efficiently, with less headroom than currently required, if peaks in demand are smoothed out through demand response offerings enabled by smart meters technology. Each client of Smart Galp will pay monthly its own spending on energy plus a value for the service, which include an intelligent system, all equipment

and installation. The value of the service is fixed during the minimum period of permanence contractually agreed, in order to cover all the costs with equipment. After this period the value of the service must decrease, since the equipment's cost will be amortized. Then, loyalty measures should be taken in order to increase the value for customers. According to the customer survey, the revenue payment has a positive correlation with the benefits' provided by the services. Feedback, Home automation, Comparison between consumers, and Cost savings are benefits that add value for the service. It was previously establish between Galp and ISA[18] that 2/5 of the revenues provided from the service belong directly to ISA, and the remaining 3/5 to Smart Galp.

Operating Model

Smart Galp business operating model differs significantly from the current operations assumed by Galp, once the data gathered with smart meters allows a customer centric approach with specific recommendations suitable for each consumer. It is essential that this new operation model is carefully deployed in order to avoid unnecessary risks for all the stakeholders involved in the business. The supply process is represented in the following figure.

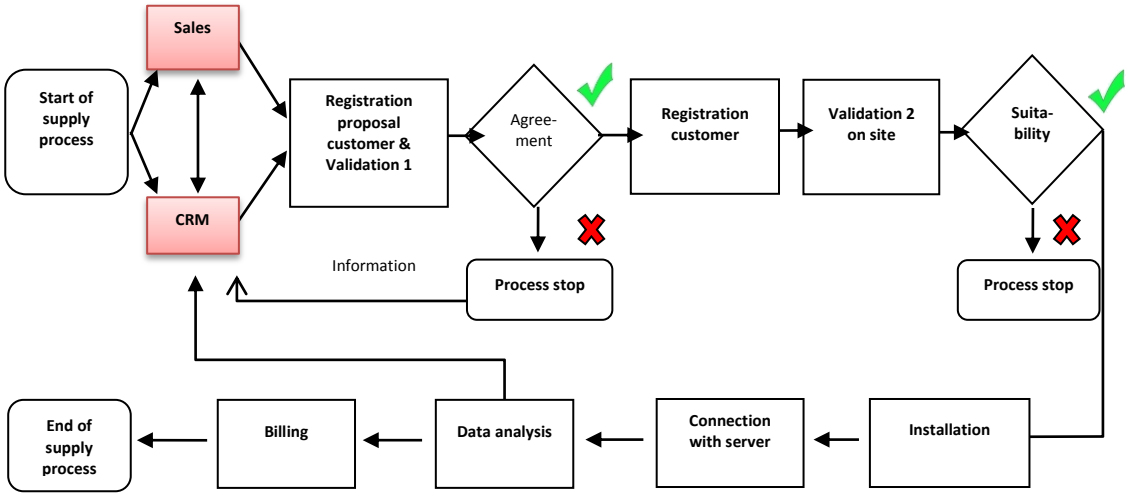

Figure 3: Operating Model

[18] ISA- Intelligent Sensing Anywhere is an internationally recognized technology-based company, providing "turnkey" solutions from the development of software and hardware, to providing services.

Value Chain Analysis

Currently in Portugal, electricity and natural gas are primarily generated in a centralized location, transmitted to the grid and ultimately distributed to the end user. Power flow is in the center of the entire value chain.

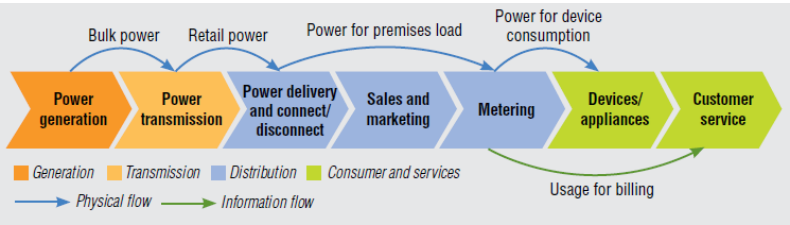

Figure 4: The traditional industry value chain (Source: IBM Institute for Business Value)

The new value chain created with Smart Galp enables real time data exchange, forcing Smart Galp to manage increasingly voluminous and complex new information flows in addition to energy flows. With this service, Galp Energia has the ability to forecast and balance loads and offer targeted products and services to customers on a more individualized basis. A variety of new participants that traditionally are not involved in the value chain will grow. That is the case of the consumer that will become an active participant. Moreover, information will flow in multiple directions, adding a remarkable value to the Smart Galp network. With this new value chain, Galp Energia is no longer a product centric to be a customer centric company, bridging the gaps of the first model.

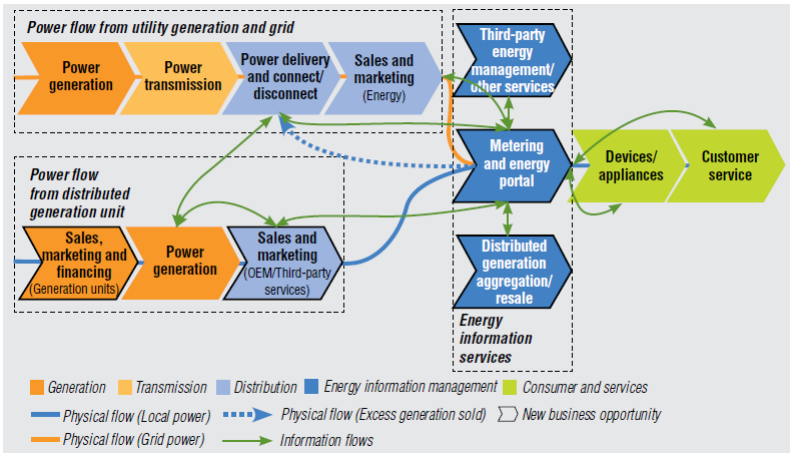

Figure 5: Increases in information flow could result in new business opportunities (Source: IBM Institute for Business Value)

Competitive Advantage (VRIO)

In order to achieve the *to be* situation of a customer centric service, it is essential that Galp Energia has a competitive advantage over competitors. The Smart Galp Project is innovative and has certain resources and capabilities that are valuable, rare and costly to imitate, being therefore a source of competitive

advantage. Through the analysis of the VRIO framework, it was possible to identify the competitive advantages that Smart Galp has that would be important to potentiate its value proposition in the market.

The most important assets are the service itself (tri-fuel offer) and the technology (web portal and devices), which took a long time to be develop and adjusted to consumers' needs. Therefore these two assets are considered as sources of sustainable advantages.

The access to a specific and valuable team as well as the close relationship to customers are considered vulnerable to imitate and consequently are not a source of sustainable advantage, but rather temporary.

Concluding, Smart Galp follows a hybrid competitive advantage model, however the most relevant ones belong to the differentiation advantage, since they have a well-diversified portfolio that would allow a permanent presence close to customers that will play an active role in this offer. Nevertheless, it could also be perceived a cost advantage due to the new technology allows the increases the productivity and reduces costs. In the following table there are represented the resources of Smart Galp and the respective competitive advantage.

Resource/ Capability	V	R	I	O	Competitive Advantage
Tri Fuel offer (natural gas, road fuel, electricity)	●	●	●	●	Sustained Competitive Advantage
Technology – (Web Portal; Devices)	●	●	●	●	Sustained Competitive Advantage
Access to Specialized teams	●	●	●	○	Temporary Competitive Advantage
Close to customers, nurturing the relationship and understanding needs	●	●	●	○	Temporary Competitive Advantage

Industry Mapping

The industry mapping is important to clearly identify all the players that interact with Smart Galp. For the development of the Smart Galp it was crucial to gather a wide range of skills in the areas of energy and energy efficiency, telemetry, communications, billing systems and customer relationship management, between others. While leader in this project, Galp Energia Group, decided to allocate their own competencies in the areas of distribution and marketing of natural gas and electricity and information systems.

For tasks related to research and development in the areas of determining the CO2 footprint, energy benchmarking, advice to change patterns and evaluation of behavior change was considered to be critical to engage the Portuguese scientific system, and has therefore been created a partnership with the MIT Portugal. The Project counts also with the experience and know-how of ISA, a leader in remote monitoring solutions applied to the areas of Energy, Environment, Security, Mobility and Health.

The required investment that allows the project to be tested was financed in 50% by Galp Energia Group and the remaining 50% by FAI (Fundo de Apoio à Inovação).

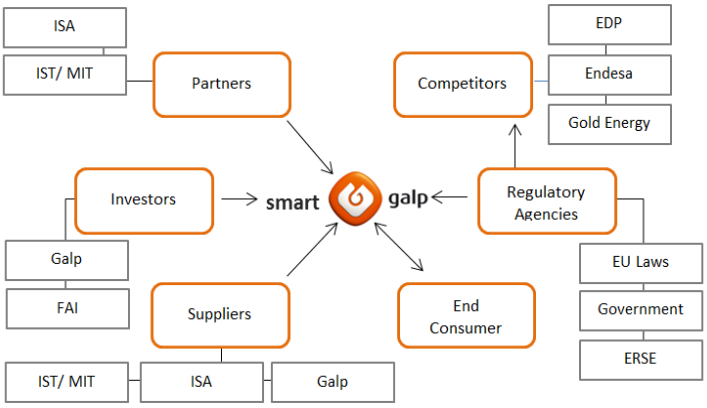

Figure 6: Industry Mapping

The partnerships created allow Smart Galp to introduce in the market a differentiated service which technologically reinvent energy meters, permits consumers to manage energy more efficiently, permits the creation of an online platform that will strong the relationship between Galp and the end consumer, bringing efficacy to the supply process. As there are European and national laws regarding the regulation of energy that must be followed, they are also included in the industry mapping of Smart Galp.

Galp Energia has some competitors; however, since Smart Galp offers a differentiated service, there is not a direct competitor[19], which is an important factor for competition in energy markets.

Competitive Assessment

International Benchmark

Over the last few years it is observable a growing development in the field of energy telemetry in the residential segment[20], highlighting the penetration of smart meter technology at a national scale in

[19] In Portugal, there are developments only related to the efficiency of power grids, an initiative promoted by EDP Inov Grid. However, their focus is related to improve the management of electrical distribution network, from a development perspective.

countries at the forefront of using this technological tool (eg: Italy, Sweden or Finland) and initiative in pilot projects worldwide, currently under a study stage of the impact of this technology implementation (eg: Britain, France, Ireland or Cyprus). According to the study *Empower Demand*[21], a pilot success heavily depends on the ability to meet consumer needs through the demand side program.

From several trials analysis[22] of smart metering in the USA, Canada, Scandinavia, the Netherlands and the UK it was possible to conclude:

- Feedback promises to be more effective when accompanied with goal setting[23];

- Weekly feedback plus advice seems to generate more behavioral change and savings than continuous real time feedback through a monitor only.

- To get advice on a longer term basis and additional feedback, internet promises to be an useful tool, through the incorporation of further analysis.

- An effective way to increase engagement and reduce consumption is through the comparison of individuals' consumption with their own historic patterns or with comparative households[24].

- Smart metering has the possibility for prepaid schemes for pay as you go meters both by phone or internet.[25]

- A program is more successful if focused on customers, being therefore essential to offer superior services benefits, pursue long-term vision, and ensure quality (Luck and Lancaster, 2003).

To conclude, from pilot studies it is clear the potential for reduction of peak load and reduction of overall energy consumption through demand response. However both types of reduction seem to depend a lot on consumer engagement.

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[20] Consult appendix 4 to understand the current situation of Europe regarding Smart Meters for Energy

[21] A project funded by the European Smart Metering Industry Group

[22] Darby (2006, 2010) from the Environmental Change Institute at Oxford University

[23] Motivational elements, such as goal setting, competitions and social comparisons, can significantly influence behavior and generate significant additional savings.

[24] Social Comparison Theory introduced by Festinger (1954) suggests that getting people to compare themselves to healthy models has proven to be an effective tool for behavioral change.

[25] Research literature indicates that savings for all keypad final customers are estimated to range broadly from 3% to approx. 15%.

Market Needs

In order to align customer needs with Galp Energia goals, Smart Galp arises as an attempt to encourage consumers' openness to change, by providing information, influencing behavior and teaching consumers' new ways to meet their goals through continuous feedback. The desire for control and the willingness to adapt a new behavior and even pay a fee for that capability are mainly influenced by the factor cost[26].

In order to better understand the target for Smart Galp service, and how to reach this target and develop a marketing and sales strategy, a survey among Portuguese consumers was conducted[27].

Sample characteristics

According to the statistical evaluation of the 335 respondents who completed the entire survey regarding consumer preferences for smart meters products and services reveals the following insights: First, 90% of respondents have EDP as their electricity supplier, and only 7% have Galp. Regarding natural gas, the majority of respondents elected Galp as their supplier (55%) and 25% selected EDP. Second, over the past three years more than an half of the surveyed sample could not reduce their spending on electricity, natural gas, and road fuel. Only a minimum percentage could reduce significantly these bills. Third, a great willingness to change behavior exists, 98% of respondents are willing to adjust their behavior regarding energy if it ensures a reduction in electricity and natural gas bills, and consumers considered that it would be valuable to have access to more information on how to reduce consumption, as well as to see consumption in real time in order to adopt such a behavior. Fifth, if through the installation of a smart metering system (solution) of energy (electricity and gas) consumers could reduce the consumption in electricity and natural gas, 96% would install it, and 75% are willing to pay monthly for such a service.

Sixth, the expected reduction of their monthly bill (70%), and the fact that they can control consumption in real time (47%) are seen as the greatest benefits of smart metering. On the other hand, the main reasons for not acquire it are the fear of the initial cost be too high, and the fact that it is an unknown technology/ service for customers. Seventh, in order to receive more information about smart meters, respondents

[26] 2008 Global Utility Consumer Survey, conducted by IBM
[27] To a better analysis of the survey conducted please consult Appendix 5

elected the webpage of energy suppliers, followed by television, and information leaflets. Also, they rely more on energy saving advice agencies and energy regulators to advise them to choose their operator and service of energy. Regarding the question: If you could purchase a device for your car, which by connecting to a portal on the Internet, would give access to your consumption and recommendations to you to become more a driver more energy efficient, would you get this device?, 63% answered affirmatively, and the main reason to this purchase is the expected reducing of fuel costs (83%).

Additionally, respondents value the possibility of an integrated supply offer of energy (natural gas, electricity and fuel) with 6.69 out of 10, and value the possibility of have a loyalty card that gives discounts and accumulate points on offer with an average value of 6.61 (from 0 to 10, in which 0 means they do not value, and 10 means they value the most). Finally, 77% of respondents are willing to, contractually, set a goal of reducing energy consumption, if when reaching this goal they would be awarded monthly. (Example: sign a contract in which you committed to reduce in 5% your energy consumption comparing with the same period last year).

These findings are corroborated by another consumer survey[28] which counts with 1000 respondents in Portugal, and which has other important insights, such as the fact that Portugal is the least techno-friendly country, indicating lower levels of familiarity with newer energy technologies; Consumers are uncertain about how much they could save on their energy bills, and they thing to do enough already in terms of energy saving; the highest level of support to smart meters arrive from high income earners.

Market segmentation

In order to recognize the existence of customer segments in the Portuguese smart meters market, and based on different customer preferences, a cluster analysis was conducted[29].

This analysis resulted in three clusters, 1, 2, and 3 contained 251, 16, and 68 cases. According to the comparison of these three clusters with different variables, it was possible to characterize the different

[28] Survey conducted by TNS UK, on behalf of Logica and Future Foundation Fieldwork in 2007

[29] Cluster analysis is a useful method to identify customer segments based on different value perceptions (Wiedmann et al. 2009). Consult appendix 6 to detailed information regarding this Cluster Analysis

market segments and find the best target for the Smart Galp Service.

- The Supporters: The first cluster reflects a stereotype of customers who expect great benefits from the use of smart meters. In this case the perceived sacrifices are lower than in the others clusters; therefore is assume that the perceived value of smart meters is higher for this cluster, meaning that the perceived value of smart meter technology is high. This segment is characterized by young customers (almost half of them is less than 35 years), with a high level of formation, in which the majority is prepared to adopt an efficient behavior regarding energy, and more than three quarter sare willing to pay for a service like Smart Galp. Concluding, in this segment people would generally support the adoption of smart meters.

- The Ambiguous: The second cluster, number 2 represents customers who on the one hand expect great benefits, but on the other hand have also huge concerns from the use of smart meters. There are also some specific characteristics in this segment, revealing that one half of customers are aged between 35 and 45 years. Remarkably all the consumers in this segment are willing to change their behavior, adopting a more efficient one, however only 56,3% are prepared to pay for a service that may help them adjusting behaviors.

- The Skeptics: the last cluster, number 3 is categorized by customers who, comparing with *The Ambiguous* segment have also deep concerns from the use of smart meters however do not expect to receive great benefits. This cluster has the lowest value perception of smart meters. Customers of this Cluster are on average older, and the ones that are less likely to adopt an efficient behavior regarding energy use.

Potential of Market Segments

According to the findings of this segmentation, it is common to assume that Smart Galp in order to get customers involved with its service has to incur in different costs per segment. The costs to convince skeptics may be much higher than the ones to convince supporters, therefore a step by step approach may be considered.

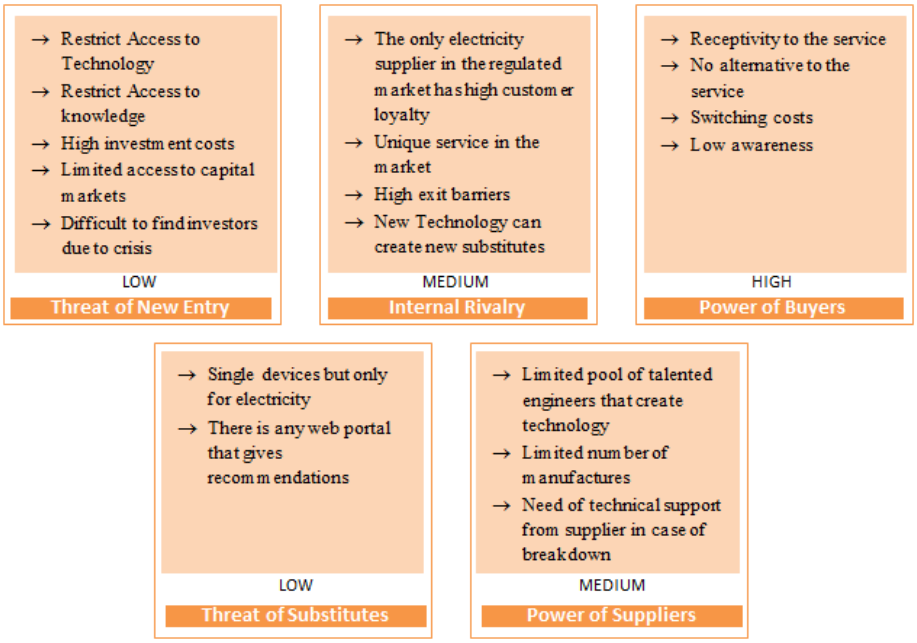
Depended on the segments which are intended to be attracted, Smart Galp may focus on a low cost (e.g. help customers lower their spending, require only low involvement, attracted all segments) driven business

model on the one hand and differentiation (e.g. innovation, require a relatively higher level of involvement from customers, only the Supporters or part of the Ambiguous group will get involved) driven business model on the other hand.

Competitive Strategy

It has been hard to consumers to understand the potential customer value of smart meters technologies. The first step in order to increase market acceptance would be to find an optimal way to communicate value for customer from the technological benefits of smart meters.

Michael Porter's Five Forces



The most powerful stakeholders are the buyers and they are the key driver of Smart Galp business Model. According to the Transaction Cost Theory[30] consumers are not willing to have the extra task of interpret and manage their power consumption unless the payoff is big enough. Besides online feedback to be flexible and less expensive for Smart Galp, it requires engagement and action from the consumer. Therefore, Smart Galp should try to lower the transaction cost for customers through technology and

[30] Developed by Ronald Coase – see Appendix 7 for more information

applications that do not require much physical or intellectual investment from customers, and which are easy to understand, give actionable information and advice, and by using effective communication channels. Moreover, switching costs may be increased through contract management and loyalty initiatives in order to decrease the Power of Buyers.

The internal rivalry, which may decrease its intensity if the focus is on differentiation rather than price, and the power of suppliers, that should be decreased by partnering models and a competitive approach through multi-suppliers and contract management, have a medium intensity and the threat of new entry as well as the threat of substitution is not considered risky for the business in a medium term.

Implementation Plan

The implementation plan is composed by ten activities with a suggested timeline of two years. The activities recommended are mostly related with marketing, communication, processes, and organizational culture. In the following table are presented all the activities of the implementation plan.

Code	Activity	2013						2014											
		J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
A. 1	Establish Partnerships																		
A. 2	Strategic integration inside company																		
A. 3	Establish price and bundles																		
A. 4	Training																		
A. 5	Align company's structure																		
A. 6	Develop CRM activities																		
A. 7	Create awareness																		
A. 8	Software improvement process																		
A. 9	Implementation CRM Process																		
A. 10	Market Implementation																		

The Twos Analysis[31] supports the competitive strategy and implementation Plan.

Risk Analysis and Contingency Plan

Concerning the inherent risks that this implementation plan could face, there are five important areas that have to be covered, and the most crucial is the risk of possible imitation of the business model by other competitors.

[31] Consult Appendix 8 to see TWOS Analysis

From a detailed analysis of the risks that Smart Galp faces, the need for a contingency planning emerges. In case of imitation of the business model, the contingency strategy to apply is not only to have the first mover advantage, but also to offer a differentiated service, customized to the end consumer.

	Risk Analysis	KPI's	Contingency Plan	Type of Impact/ Nature
Business Model and Partnerships	1. Partners do not accept the partnership agreement or there is high dependency on them 2. Competitors imitate the business model	- Number of agreements - Appearance of similar services	Secure long term contracts with strategic partners Enhance service offering on Smart Galp portal	Medium/ Long Term
Financial	3. Consumers' prospect of recovering the investment is low 4. Lack of liquidity of partners	- Financial forecast of partners	Highlight the expected energy savings of up to 10%	Medium/ Medium term
Operational	5. Inability of the software to support the number of users	- System breakage - Velocity of system	Have a server backup	High/ Short term
Commercial	6. Limited number of consumers	- Number of users	Continuous software development to ensure customer's interest	High/ Medium term
Implementation	7. Marketing campaigns' failure, not raising awareness, motivation and involving users 8. Resistance to change	- Number of users	strong marketing highlighting the energy savings of up to 10%	High/ Medium term

Recommendations

In order to answer the research question of *How to potentiate Smart Galp Business Model?*, some recommendations are presented by branch of the issue tree to fulfill the gaps that may occur during the implementation.

Branch	Area	Recommendation
Market Share	Promotion and Advertising	**Segmentation** Consumers are different and have diverse concerns. Environmental benefits are important to supportrs, while convenience or price is more important for ambiguous or skeptics. Therefore, a one-size-fits-all solution is unlikely to be, and the willingness to pay of different segments may be different and is not considered. I recommend Smart Galp to understand and target each consumer segment with tailor made price/service offerings, through a step by step approach trough the service life-cycle, giving priority in the growth stage to early movers - supporters, since they will speed up the diffusion of innovations through other segments and have a higher perceived value. Therefore, Smart Galp should propose services that offer a value added to customers. .

Market Share	Promotion and Advertising	**Communication** I recommend Smart Galp to have a strategy to involve (engage consumers with smart meters promoting shared values and creating trust) and another to inform customers (provision of general information about risks, benefits and specific information about installation of smart meters). Upstream involvement (during the decision-making process) is important for information processing, and may include demonstrations and public presentations about smart meter, as well as Galp involvement in community events (may serve to build social trust). Downstream communication (after the implementation of smart meters has taken place) can be achieved through the creation of shared value between consumer and Smart Galp, by providing continued information about what smart meters may offer to consumers, to maintain public trust and acceptance in the long-term, through Galp' website, community meetings, and mass media campaigns.
		Marketing The first necessary step is the creation of consumer awareness in order to the public fully understand the opportunities offered by Smart Galp in terms of innovative service, energy saving, sustainability and quality of supply. In order to help users understand the value and the implications of smart meters working and equipment some actions may be taken through an education process, which can be encouraged through educational campaigns, advertisements, advisory services and news media. According to the consumer survey consucted for this research, even environmental concerns being important in influencing people's behaviors, cost came across as the strongest motivator for saving energy. Therefore I recommend a emphasis on the cost savings achievable through Smart Galp in the communication approach. Moreover, consumers look for relevant and directly actionable information and solutions to problems and they therefore tend to rely on organizations that are seen as impartial and specialists in the field rather than relying on what their families, the media, or even their government says. For each consumer segment Smart Galp needs a different strategy approach, since each has precise needs and wants. According to the survey conduct during this study, the segment of 'supporters' tends to prefer to receive information through the webpage of the utility, while the 'ambiguous' and the 'skeptics' prefer advertisement on television and informative brochures. I recommend Smart Galp to send more detailed bills with the information of the new service in order to create awareness between their customers. The cost saving factor is crucial in order to communicate effectively. In order to capture the 'supporters' segment, which are the ones more willing to adopt the service, Smart Galp can opt by direct marketing, through special interest media (magazines, web sites), or interest groups.
		Rewards In order to engage customers, and stimulate the interaction between Galp and customers, rewards are a great option to build customers' loyalty. Rewards may create some value by motivating new customers to try Smart Galp service in the short run, but in the long run they can accelerate the loyalty life cycle. Therefore, Smart Galp must create a system where customers can follow the rewards of loyalty and which motivates them to earn it. The suggestion is to form a ranking with consumers' percentage of savings. The top ten can be rewarded with different options, such us one month free service, road fuel disounts, or duplicate points of 'fast' card.

Market Share	Promotion and Advertising	**CRM Initiatives** CRM is one of the best ways to improve the relationship with customers. Moreover, it is important to nurturing this relationship in a profitable way. In a first phase it is important to engage and get new clients, then create loyalty in order to keep them, and finally try to grow by creating customer satisfaction and value. The following initiatives are expected to have a positive influence in how customers value Smart Galp. - To increase engagement and create long term relationship with supporters, Smart Galp can offer customers delightful moments by creating win-win partnerships. When adheres to the service the customer receive a voucher to spend on one of the partners' offer, and after a year they receive a voucher congratulating them and with the amount saved during the year, that allow them to acquire something from the partners offer. - Create a dialogue with customers through social network engagement; respond to customers' complains; ask for suggestions and feedback. Customers will realize that Smart Galp cares about their level of satisfaction, and Smart Galp can improve the service. - Increase engagement and Customer Satisfaction with supporters through a premium service which reward the top ten consumers according to the ranking established in the portal. The consumer can choose his reward that may be a discount on road fuel, or accumulate points in the loyalty card, that can be converted in multiple offers. This will preserve rentable clients satisfied, engaging the most participating ones, incentive customers to save. - Continuous improvement by understanding customer needs and try to fulfill them According to the data gathered, understand which recommendations consumers need more, informing the client of all the possibilities. Understand consumer's needs and increase the service effectiveness. The consumers' benefits since their needs are fulfilled, and they feel the support from Smart Galp.
	Price	**Price scheme** Clearly, an according to the survey, many respondents are likely to adjust their behaviors once the option is offered to them, and are willing to pay for a service such as the one Smart Galp offers. In order to successfully communicate the added value for the increase of customer perceptiveness, it is crucial to understand and adapt the message to Smart Galp service's characteristics. To do so, Smart Galp must assess the target customer's relative cost of search for information relatively to differentiating attributes of the service and the type of benefits sought, according to monetary or psychological value. Moreover, according to already implemented smart meters in Europe, it was proven that consumers on pre-paid schemes generate more savings[32] through demand response than customers on credit, it also reduces the financial risk for the utility service provider . Accordingly, Smart Galp may think in adopt a pre-paid scheme.
Cost Optimization	Organization & Partnerships	**Organizational Culture** It is essential to not focus only on technology or financials since it does not generate engagement and might fail. On the top of the agenda Smart Galp should put consumer response, in order to avoid the backlash observed in some European programs and to maximize consumer engagement. In order to succesfully make the bridge between a product centric to a customer centric culture, all departments might be aligned and focus on customer retention, offer superior services benefits, pursue long-term vision, and also ensure quality. Therefore, to reinforce the customer centric approach, Smart Galp can allocate to each consumer an account manager, which is evaluated by the level of customer satisfaction, and who monitors the consumption of customers and advises them according to their preferences in order to them extract the most value of the service.

[32] 'Many consumers report it is easier to manage their household budgets with a pre-paid scheme, since they can schedule smaller, more frequent payments, enjoying the freedom to use that money for other needs. Electric utilities using pre-paid program report that many participants gain important knowledge from daily energy use alerts and data, and reduce their electric consumption by as much as 15%. They more easily recognize the correlation between certain activities and the daily time, make more informed decisions, and manage daily energy use better.'- Kevin Hurd, Cuivre River Electric Cooperative

Cost Optimization	Operating Model	**Strategic Partnerships** I recommend Smart Galp to collaborate with third party providers to come up with engaging product/service offerings. A loyalty card should be developed, to allow cross-selling promotions across services. Galp Energia has already the 'fast' card, which consists in a program that rewards consumers loyalty. Consumers only have to accumulate 'fast' points on their card, what happens when one makes a purchase or supply in Galp stations. For a good loyalty strategy it is important to have several benefits for customers that use Smart Galp services, and this can be accomplished through partnerships with other companies. Therefore I advise Smart Galp to integrate their services in this 'fast' card allowing customers to be rewarded for their preference in the procurement of products and services of Galp Energia, through access to bonuses, benefits, and other products and services, both in filling stations, or from third parties entities that participate in the program or are on the list of partners. Moreover these card may allow the consumers to accumulate points with their savings with both electricity and natural gas.
Sources of Competitive Advantage	Web Portal	**Goal Setting and Contests** Leverage social networks may help to motivate consumers through the use of goal setting, and competitions. Consumers value consumption that results in recognition, and social network allows immediate interaction, such as sharing comsumption, which generate reactions. Therefore, the possibility to transform the level of consumer savings into a contest that could be shared on social media, may motivate consumers to set goals and make the effort to achieve them. I suggest Smart Galp to introduce a gaming related to level of savings, reinforcing competition which is proved that may lead to comparison and social contagion that may influence behavior.
	Staff	**Training** All employees who are involving in customer services, may receive training to better advise and help consumers. Smart Galp may invest on specialized manpower that may be necessary to install and maintain the equipment and it services. Moreover Smart Galp should create a brochure with all the information regarding devices, web portal application, mobile/ tablet connections, in order to consumers become aware of all the utilities.

Conclusion

From this research is possible to conclude that market acceptance of Smart Galp by customers can be enhanced through a better fit of the value propositions of the business model with customer segments' value perception, as this leads to higher customer value. Since, historically, consumers are relatively uninvolved with energy, the value created by smart meters is perceived as a relatively low value proposal for consumers. Therefore, a communication approach built on establishing trust through both information and involvement of the public across temporal phases of deployment is necessary to increase public acceptance of smart meters within the portuguese market. Therefore, Galp Energia should direct its efforts on the understanding and improving of consumers' relationship with energy, by keeping transaction costs as low as possible for consumers, making consumer applications user-friendly, and searching for

continuous improvement, in order to be a valuable source of competitive advantage. With customer segmentation, enhace of the service differentiation offer and adequate Advertising and Promotions it is possible to increase the market share and optimize costs, potentiating the Smart Galp business model in the portuguese market.

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