A work Project presented as part of the requirements for the Award of a Master's degree in Management / Economics / Finance

from the Nova School of Business and Economics

Consulting Lab for Galp Energia:

Business Model Bio LPG and LPG as a Support Energy

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A Consulting Lab carried out under the supervision of:

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21-05-2021

Abstract

The energy market is facing challenges, mainly the energy transition to renewable sources to achieve decarbonization. Galp is the leading company in the LPG market, a segment that expects a constant decline in the next years, due to the incentive to electrification. The main goal of the project is to development the business model of a new product, a more sustainable version of the LPG, creating a competitive advantage in the market, as the pioneer of Bio LPG. In this way, Galp is capable of leveraging its position with a unique and valuable new offer, projecting a greener image of the company. The new value proposition for Bio LPG was created based on the Value Delivery framework, fed by the benchmark on LPG and non-LPG sectors, brainstormed with the Galp's project team and validated through a hypotheses testing. The project's outcomes are the strategic recommendations for the three targets, Bottled LPG, Auto LPG and Bulk LPG, with the respective financial analysis and communication and implementation plan.

Keywords: Energy Transition; Bio LPG; Carbon Credit Market; Gas; Sustainable.

This work used infrastructure and resources funded by Fundação para a Ciência e a Tecnologia (UID/ 00124 2013, UID/ECO/ 00124 2019 and Social Sciences DataLab Project 22209 POR Lisboa (LISBOA 01 0145 FEDER 007722 and Social Sciences DataLab Project 22209 and POR Norte (Social Sciences DataLab Project 22209

Acknowledgements

Firstly, our group would like to express our very great appreciation and deep gratitude to our dearest advisor, Professor Constança Monteiro Casquinho, for the opportunity to develop this project. The Professor's guidance, encouragement, and positivity contributed not only to the development of a successful project, but also to our professional and personal growth.

The group would also like to express our heartfelt gratitude to our project coordinator at Galp, Dra. Isabel Pedrosa, for the tireless support over the last four months. Her experience, constructive insights and constant feedback were critical for the quality of the work developed.

Additionally, we are remarkably thankful to Dr. João Pedro Machado, Dr. André Cardoso, Engº Ádrian Lazareno, Engº Hugo Pereira Ferreira, Engª Cristina Campos, Engº Miguel Anjos, Engº Alexandre Almeida Carneiro, Dr. Filipe Sequeira, and to the steering team for the strategic advice and industry expertise, that assured the work was aligned with the client's expectations. The team would also like to extend a sincere vote of gratitude to Dra. Susana Quitério, Dra. Marisa Silva, and Dra. Sara Trindade for the availability and feedback, which were crucial to the development of the project. Lastly, to all, we would like to thank for making us feel part of the team.

We also take this opportunity to show our gratitude to Nova School of Business & Economics and our Professors, who prepared us for the challenges this project presented.

Finally, we would like to express our deep gratitude to our families and friends for the endless support and encouragement.

Glossary

Word	Definition
4 P's	Refers to Product, Price, Place and Promotion.
B2B	Business-to-Business.
B2C	Business-to-Consumer.
Bio LPG	LPG produced from renewable feedstocks, such as plant and vegetable waste material.
Biobutane	Butane produced from renewable feedstocks.
Biodiesel	Cleaner-burning alternative to petroleum diesel that is made from renewable resources.
Bio Fatty Acids	A fatty acid is a subunit of fats, oils, and waxes.
Biogas	Gas produced from organic matter.
Biomethane	Methane produced by the fermentation of organic matter.
Bio-oils	Any automotive oil that is synthesized, as opposed to being petroleum-based.
Biopropane	Propane produced from renewable feedstocks.
Butane	Flammable hydrocarbon gas of the alkane series, present in petroleum and natural gas.
Butylenes	Component used in making gasoline components.
Carbon Emissions	Emissions stemming from the burning of fossil fuels and the manufacture of cement.
CO_2	Carbon Dioxide.
Co-processing	Simultaneous conversion of biogenic residues and intermediate petroleum distillates in petroleum refineries for the production of renewable hydrocarbon fuels.
Co-product	A product produced during the manufacturing of another product.
Cylinder	Bottle of gas.

Table 1: Glossary (I/II)

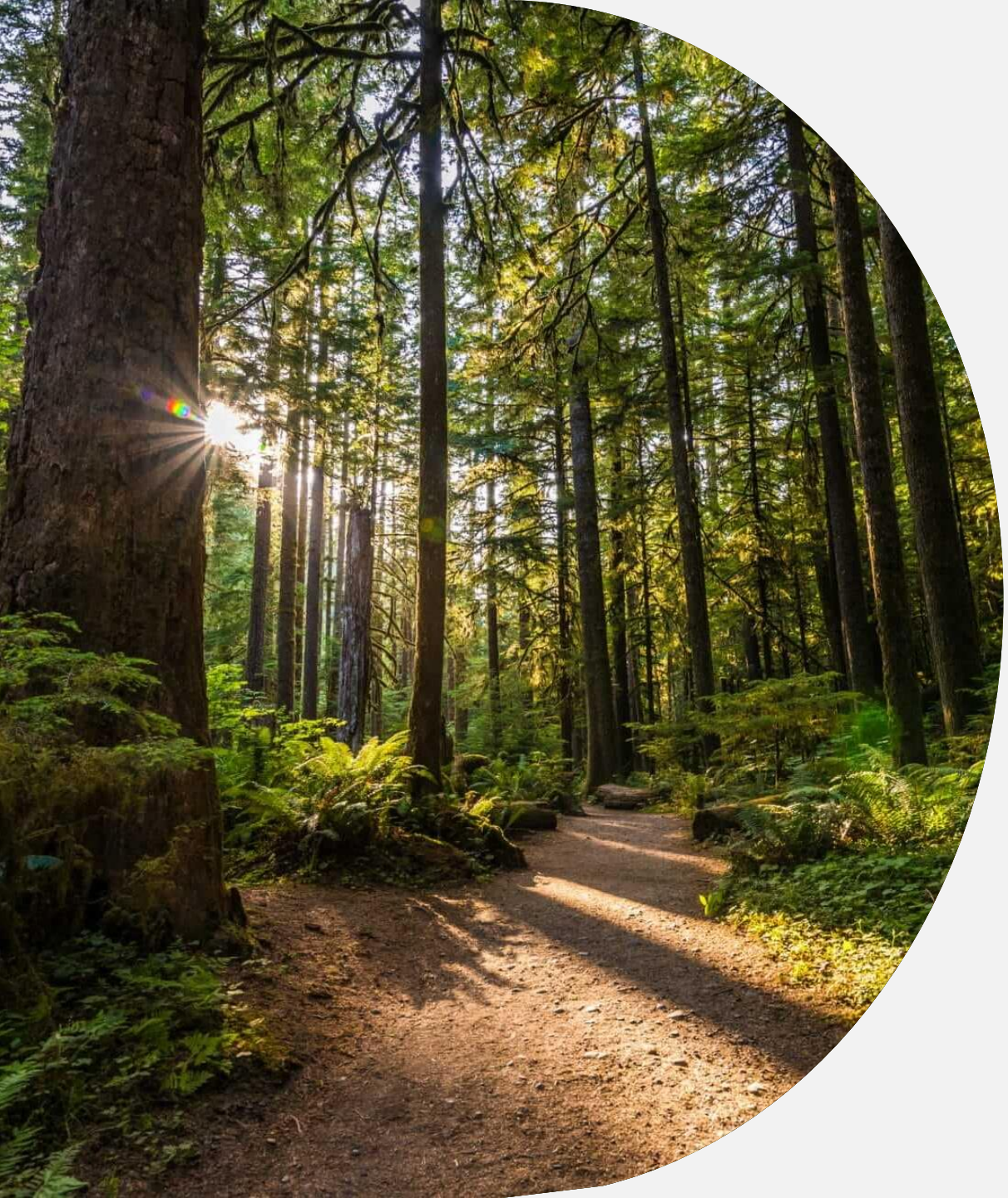
Word	Definition
Deposit	Price of the LPG cylinder, that can be returned when the customers want to return the cylinder.
Dimethyl Ether	Synthetically produced alternative to diesel for use in specially designed compression ignition diesel engines.
Ecofining	Patented process to transform organic matter into fuel.
FMCG	Fast-Moving Consumer Goods.
HVO	Hydrotreated Vegetable Oil.
ISCC PLUS	Sustainability certification system covering the entire supply chain and all kinds of biobased feedstocks and renewables.
LNG	Liquefied Natural Gas.
LPG	Liquified Petroleum Gas.
Mass Balance Principle	Consideration of the input, output, and distribution of a substance between streams in a process.
M&C	Marketing and Communication.
M.E.	Margin of Error.
Midstream Margin	Gain measured by Galp's refinery in the production and commercialization of Bio LPG to the Galp business.
NEXBTL	Renewable diesel fuel production process by the refining company Neste.
Pluma	Galp's light LPG cylinder.
Propane	Flammable hydrocarbon gas of the alkane series, present in natural gas and used as bottled fuel, more suitable for outside use.
Propylenes	Component used in making gasoline components.
R&D	Research and Development.
QL	Qualitative.
QT	Quantitative.

Table 2: Glossary (II/II)

Executive Summary

- The LPG Market is **expected to fall at an approximate annual rate of 3% over the next years**, due to the threats of electricity and natural gas. To remain relevant on this market and embrace changing customer preferences towards more sustainable products, Galp wants to **start commercializing Bio LPG**, for the following **three targets: Bottled LPG, Auto LPG, and Bulk B2B LPG.**
- The project methodology is divided in three parts, the **diagnosis,** the **analysis,** and the **recommendations,** to develop the value proposition for the introduction of the product in the Portuguese market.
- In the diagnosis phase, there were developed internal and external analyses to understand Galp's characteristics and the market context. **Galp is the leader in the LPG market,** having the biggest network of points of sale. Repsol, Rubis Gás, OZ, Cepsa, and Prio are Galp's main competitors in the LPG market. **The company is likely to face the competition of Repsol and Cepsa in the Bio LPG market.** Additionally, there were identified best practices on the international Bio LPG market.
- Subsequently, four pillars were identified which should underpin the value proposition to be tested: **product, digitalization, sustainability, and partnerships.**
- From the analysis and expert interviews, there was concluded that the **price of the product for the targets of bottled LPG and Auto LPG should not increase**, while **the price of the Bulk B2B target could increase up to 2%.** Both the allocation of the product to the three targets and the product Bio LPG incorporation were determined according to the results of the financial analysis.
- Since the **Local Production Recovery is a profitable project** and it does not require neither a great investment nor much time of preparation, the project should be undertaken in the short-term (2022). For the **New Production Unit, the project presents great financial indicators**, but it also requires a higher investment and time to have the infrastructure fully operational (2024). **After 2024, both projects will coexist at the same time.**

Agenda



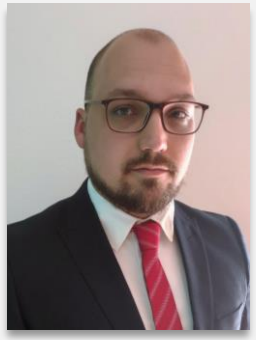
1. Project Overview

The Consulting Field Labs are real-life projects with close collaboration between the company and the team of students, which immensely benefits both parties

Overview | The Consulting Field Labs are real projects and business challenges to be developed by a group of students in a corporate environment. There are benefits for both the students and the company. On one hand, students have the opportunity to work in a relevant consulting project, experience the real working environment, and apply some theoretical tools and frameworks in practice. On the other hand, the company benefits from young talent with a high academic background and, also, from the creativity these students can bring to the company, since by being external, the students can present innovative ideas and concepts.

Objective | The main objective of the project was to elaborate a business plan on how to introduce a new and most sustainable energy source, the Bio LPG, on the Portuguese market, namely on which segments the new energy should be introduced and with which incorporations. For the past four months, Nova SBE's team worked in close contact with Galp's team creating and validating ideas to be later used in the construction of the Business Model and Implementation Plan.

Nova SBE Team



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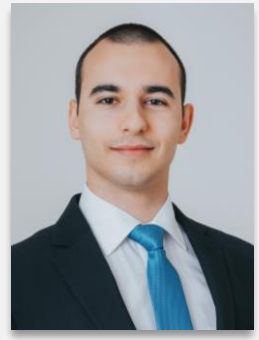

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Bio LPG will help Portugal in the energy transition, and in the long-term for Carbon Neutrality

Situation: Galp aims to be the pioneer in the commercialization of Bio LPG

Currently, Galp is a market leader in the LPG market and aims to be the pioneer in the commercialization of Bio LPG, a more sustainable version of LPG, in the Portuguese market. In the refinery of Sines, Bio LPG is being produced as a co-product, which has been consumed internally and has recently been incorporated in the Auto LPG network. This product is successfully commercialized in several European markets, given that the customers' preferences are shifting towards more sustainable products. Additionally, the Portuguese government is pressuring industries to reduce their carbon emissions with the establishment of limits, which represents an opportunity for Bio LPG.

Complication: Uncertainty product acceptance and expected competition

Bio LPG is a scarce product on the European market, which makes the possibility of obtaining the product uncertain. Also, as a new product, the national market receptiveness is unknown. Galp suffers a high competitive pressure due to the possibility of other companies entering in Bio LPG market, such as Repsol, which has already made the commitment to produce Bio LPG in Spain.

Main Project Questions

- What should Galp's **new value proposition on the Bio LPG market** be, considering international and national benchmark and best practices, market and consumer trends, and its business?
- What should be the most viable and profitable **strategy implemented** by Galp to acquire Bio LPG?
- How can Galp **position** itself as a sustainable and pioneer player with the **Bio LPG in the Portuguese market**?

The project's main focus is to launch a new sustainable energy source, the Bio LPG, in the B2B and B2C segments

SCOPE

PRIMARY GOAL | The project's focal point was to develop a value proposition proposal to **implement a new sustainable energy source** in the market, the **Bio LPG**. Galp aims to become the first producer and distributor of Bio LPG in the Portuguese market and subsequently grow in the LPG market.

PRODUCT | The project focused on defining a launching plan for the Bio LPG and developing a business case for the implementation of the new product in the market. The Bio LPG will be incorporated according to a certain percentage in the existing LPG products. Galp aims to be the **pioneer of Bio LPG** in the Portuguese Market, **enabling the energy transition** of the country.

CUSTOMER | The project analysis targeted the **B2C segment, with the bottled LPG and auto LPG** customers, as well as the **B2B Bulk LPG** customers.

MARKET AND GEOGRAPHY | The product will be offered through the same channels conventional LPG is offered, in order to **gain competitive advantage from their peers in the LPG market.** The project's market is **Mainland Portugal,** due to the differences in supply in the autonomous regions.

Bio LPG is an efficient and more sustainable solution than conventional LPG, with its positive environmental impact being the most significant advantage

BIO LPG

IDENTICAL

Bio LPG has the **same chemical composition as conventional LPG**.[1] Hence, the two products can be mixed in the desired proportion.

LOW CARBON FOOTPRINT

The product has an **organic origin**[2], and it can emits 85% less carbon dioxide than conventional LPG[3].

CO-PRODUCT

Currently, most of Bio LPG in the market is a co-product, which is **a derived of the HVO production[2].**

ADAPTABLE

Switching to Bio LPG is an **easy and low-cost operation**, as there is no need to change or adapt existing equipment or applications.

POTENTIAL BACK-UP

Potential ally of renewable energies, since it is easily stored giving consumers security and flexibility in the energy supply.

Sources: [1]SVH Energy, [2]Apetro , [3]WLPGA

2. Project Methodology

The project's methodology to develop the value proposition is composed by the following phases: the diagnosis, the analysis, and the recommendations

	I. Diagnosis (7 weeks)	**II. Analysis** (6 weeks)	**III. Recommendations** (4 weeks)
Project Activities	▪ Product Analysis ▪ Definition of the main factors affecting the Bio LPG Market ▪ Analysis of the **National Market's competitive environment** ▪ **Development of an International and Non-LPG Markets benchmark**, with the identification of best practices ▪ Analysis of Galp and its positioning on the LPG market (**SWOT**) ▪ General Environment Analysis (**PESTLE**) ▪ Understanding the LPG and Bio LPG Market Dynamics (**Porter's 5 Forces**) ▪ Development of a **preliminary version of the value proposition,** to be tested on the Analysis phase	▪ **Formulation of the value proposition** according to the feedback received ▪ Script development and **conduct a total of 30 in-depth qualitative interviews** (to the three targets studied) ▪ **Qualitative Research Analysis** ▪ Development of **surveys**, based on the insights gathered from the qualitative analysis ▪ **Quantitative Research Analysis**	▪ **Validation of the value proposition** according to the insights gathered on the Qualitative and Quantitative Analysis ▪ Analysis of the **Carbon Credits Market and fiscal incentives** for the companies for reducing carbon emissions ▪ **Financial Analysis** – Assessment of the profitability of the different projects considered ▪ **Implementatition Plan**: Price, Product, Promotion and Place
Deliverables	▪ Kick-Off Document ▪ Analysis of the different LPG production processes ▪ National, International, and Non-LPG Sectors' Benchmark ▪ Preliminary version of the value proposition	▪ Qualitative Interview Scripts and Quantitative Questionnaires ▪ Qualitative and Quantitative Research Analysis	▪ Financial Impact of the Value Proposition (for different projects and sensitivity analysis) ▪ Value Proposition and respective implementation plan

Table 3: Project Methodology

Note: Project Timeline in Appendix 1.

A PESTLE analysis, the Porter's 5 Forces of competition, a SWOT analysis, and a TOWS analysis were developed in order do accurately develop the project Diagnosis

To accurately develop the proposed value proposition, the Diagnosis, Analysis and Recommendations stages were supported by several authors and stategic frameworks, outlined on the project methodology.

I. Diagnosis

PESTLE	A PESTLE analysis can be conducted to understand the macroeconomic factors which have impacted or may impact the company's future strategy. The framework divides these factors depending on whether they are Political, Economical, Social, Technological, Legal, or Environmental.[1]
Porter's Five Forces of Competition	Hitt, Ireland and Hoskisson (2009) state that it is critical to understand the industry environment, as it may have a more direct effect on the firm's strategic competitiveness than the company's general environment. The Porter's Five Forces of Competition measure the attractiveness of an industry by assessing: the intensity of rivalry, the threat of new entrants, the threat of substitute products, the bargaining power of buyers, and the bargaining power of suppliers.[1]
SWOT	Philip Kotler describes, in the Marketing Management book, a SWOT analysis as a tool that provides a combined assessment of the internal marketing environment, with the Strengths and Weaknesses, and the external marketing environment, with the Opportunities and Threats. The framework was developed by Dr. Andrew Humphrey (1970). [2]
TOWS	Developed by Heinz Weihrich, the TOWS framework derives from the SWOT analysis and aims at combining internal and external factors, to leverage strengths, extinguish weaknesses, take advantage of opportunities and minimize threats. [3]

Table 4: Literature Review (I/II)

Sources: [1]Hitt, Ireland and Hoskisson (2009) – Strategic Management; [2]Kotler and Keller (2012) – Marketing Management; [3]Nadine Pahl and Anne Richter (2009) – Swot Analysis: Idea, Methodology and a Practical Approach.

The analysis was developed according to a deductive approach, a mixed-methods research, and sample selection, while recommendations followed the marketing mix

II. Analysis	**Deductive Approach**	The deductive research, which tends to proceed from theory to data, was developed according to what had been defined by Robson (2002). Robson introduces five sequential stages according to which the deductive research should be developed: (i) deduct a hypothesis from the theory; (ii) expressing the hypothesis in operational terms; (iii) testing the operational hypothesis; (iv) examining the specific outcome of the inquiry; (v) if necessary, modify the theory. [1]
	Mixed-methods Research	The sequential mixed-method research is a multiple method which uses quantitative and qualitative data collection techniques and analysis procedures, one after the other, without them being combined. Accordingly, even though both the quantitative and qualitative are used at the research methods stage, qualitative data is analysed qualitatively, and quantitative data is analysed quantitatively. [1]
	Sample Selection	The larger the sample size, the lower the error in generalizing to a population. Saunders (2007) states that when choosing a sample size, there should be considered the level of certainty that one has that the characteristics of the data collected will represent the characteristics of the total population; the margin of error one is willing to tolerate; the types of analyses one is going to undertake; and the size of the population from which the sample is being drawn. [1]
III. Recommendations	**Marketing Mix (4 P's)**	The Marketing Mix approach using the 4P's Framework, namely Price, Product, Place (or Distribution), and Promotion, defined by Jerome McCarthy (1964), was used to structure the decision-making process into the recommendations, delivering a defined output of the project. Accordingly, to the McCarthy (1964), the marketing mix enables to develop an efficient marketing plan and leverage the operation's results by choosing the certain combination and variables.

Table 5: Literature Review (II/II)

Sources: [1]Saunders, Lewis, & Thornhill (2007) – Research Methods for Business Students

A mixed-method design of the research was used to understand the key patterns and issues to evaluate the receptiveness of the market

The research followed the deductive approach, in which the hypotheses were tested. The **deductive research** progressed according to the sequential stages listed by Robson (2002)[1], with a **mixed-method design,** namely Explanatory Sequential Mixed Methods (Creswell, 2012)[2], where the qualitative method is analysed firstly and used to redesign the quantitative method to obtain a wide understanding of the results.

	1) Data Comprehension & Identification	2) Key Issue and Patterns Analysis	3) Gather Conclusions
QUALITATIVE	▪ Interviews conducted online and by phone, following a script; ▪ On-going analysis and final conclusions permitted identify key topics and patterns.	▪ The information collected was analysed for a deeper insight into the key topics and patterns; ▪ Crucial issues were identified in the tested hypotheses, giving the opportunity to redesign.	▪ Internal brainstorming to solve key issues and identified customer pain points; ▪ Reformulation of the hypotheses to test in the quantitative method.
	1) Survey Creation & Distribution	**2) Hypotheses Development**	**3) Hypotheses Testing**
QUANTITATIVE	▪ Designed the surveys to test the market receptiveness to the value proposition; ▪ Distributed in social media and specific online forums to reach specific targets.	▪ Analysis of the principal questions and hypotheses; ▪ Performed Cross sectorial analysis in Qualtrics, to observe patterns between the customer's preferences for each target.	▪ Compared the value proposition hypotheses in terms of customer's preferences and viability; ▪ According to the results, hypotheses were confirmed or refused.

Table 6: Qualitative and Quantitative method Research Methodology

Sources: [1]Saunders, Lewis, & Thornhill (2007) – Research Methods for Business Students; [2]Ragab & Arish (2018) – Research Methodology in Business: A Starter's Guide

Both the qualitative and quantitative scripts followed the same structure, with two parts: the contextualization and the responsiveness to the preliminary value proposition

In-Dept Interviews and Online Surveys | Script Design

Environmental Concerns & Sustainability

Regular environmental practices

Sustainability concerns

1. Bottled LPG
2. Auto LPG
3. Bulk B2B LPG

Contextualization

Offer Responsiveness

Existing Product (Bottled LPG, Auto LPG, and Bulk LPG)

Bottled LPG

Auto LPG

Bulk B2B LPG

LPG consumer profile

1. LPG consumption advantages;
2. Brand / Seller selection: Reasons to choose the brand;
3. Uses and monthly consumption;
4. Environmental impact of the gas consumption.

Bio LPG

Advantages | Fears

Brand image

Price sensibility

Bio LPG incorporation

- **Price vs Incorporation Predisposition to buy the product:**
  a. Own brand
  b. Change brand

Additional Services (*Mundo Verde*)

Adherence to additional services

Adherence to *Mundo Verde*

a. Environmental impact
b. Discounts
c. Donations
d. Predisposition to use

Partnerships

1. **Bottled LPG**
   - Points of sale
3. **Bulk B2B LPG**
   - Promotional video

The research was developed using both qualitative and quantitative approaches, to test and validate hypotheses and the preliminary value proposition

Sample Design | In order to support and validate the value proposition designed, two types of data were collected and analysed, qualitative, through in-dept interviews, and quantitative, with online surveys, both for each of the three targets to be analysed.

Qualitative

In-Depth Interviews *(March 10th to 20th 2021)*

- There were interviewed decision makers from key LPG providers for each of the three targets:
  I. **16 interviews for Bottled LPG**;
  II. **5 interviews for Auto LPG**;
  III. **9 interviews for B2B Bulk LPG**.
- Samples' size was determined taking into consideration both time and accuracy, while interviewees were chosen according to **pre-selected criteria**.
- Interviews followed a pre-conceived **script**, transversal for the three targets, with a duration of around 45 minutes.

Quantitative Surveys *(March 21st to 27th 2021)*

- The surveys for the three targets were distributed online using **Core XM Qualtrics' platform**.
- The analysis of the data was performed online, using **Qualtrics Stats IQ platform**, with access ceded by Galp.
- Surveys were open 7 days and had different reaches according to each target:

I. **298 valid answers** and 764 reached people for Bottled LPG;

II. **172 valid answers** and 264 reached people for Auto LPG;

III. **18 valid answers** for B2B Bulk LPG.

Quantitative

Note: Further details about the Sample Design in Appendix 2.

The collected sample exhibits the required criteria to properly represent the age, gender, location and other relevant quotas

Sample overview | The qualitative analysis was perform on all the three targets according to different criteria

Bottled LPG

16 In-Depth Interviews

	Baby Boom	X	Millennium	Z	Total
RUBiS GÁS	1	4	1	1	7
galp	1	2	2	1	6
REPSOL	1	1	-	-	2
OZ ENERGIA	1	-	-	-	1

Table 7: Bottled LPG qualitative sample

The sample was gathered taken into consideration the relevant quotas regarding:

- ✓ Gender
- ✓ Location (Lisbon & Oporto / Rest of the country)
- ✓ Type of residence (House / Apartment)
- ✓ Type of cylinder used
- ✓ Environmentally concerned profile

Auto LPG

5 In-Depth Interviews

Brand	Total
galp	2
bp	2
REPSOL	2
E.Leclerc	1

Table 8: Auto LPG qualitative sample

The following quotas were considered when selecting the interviewees:

- ✓ Gender
- ✓ Age
- ✓ Location (Lisbon & Oporto / Rest of the country)
- ✓ Environmentally concerned profile

B2B Bulk LPG

9 In-Depth Interviews

Activity Sector	Total
Agriculture & Cattle	3
Hospitality	3
Textile	1
Electronics	1
Technology	1

Table 9: Bulk B2B LPG qualitative sample

All interviewees were **Galp's** existent clients. Companies were chosen taking into consideration the following criteria:

- ✓ Size (Big / Small LPG consumption)
- ✓ Activity type (Industry / Services)
- ✓ Location (Lisbon & Oporto / Rest of the country)

Note: Qualitative Detailed Sample Overview in Appendix 3
Source: Qualitative Analysis

The sample exhibits the required criteria to properly represent the universe of each target, and the size was determined considering the size of each universe

Sample overview | The quantitative analysis was perform on all the 3 different targets

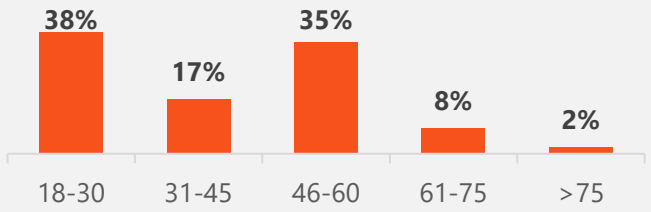
Bottled LPG

298 Valid Answers (Reach of 764 people)

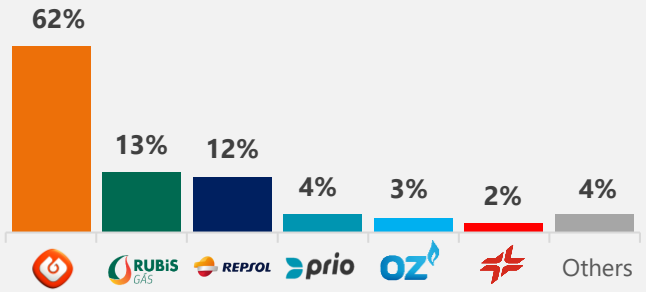
59%* Female
39%* Male
*2% Prefer not to say

72% Decisor
28% Influencer

Age



Brand

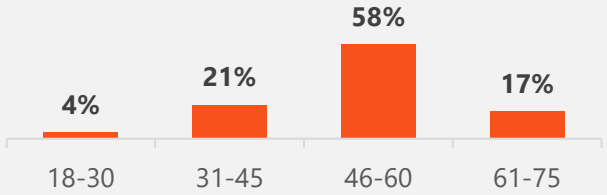


Auto LPG

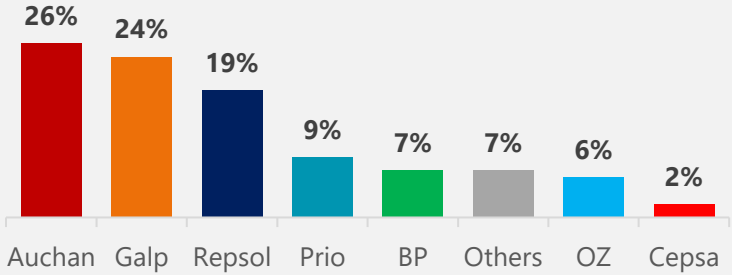
172 Valid Answers (Reach of 264 people)

12%* Female
87%* Male
*1% Prefer not to say

Age



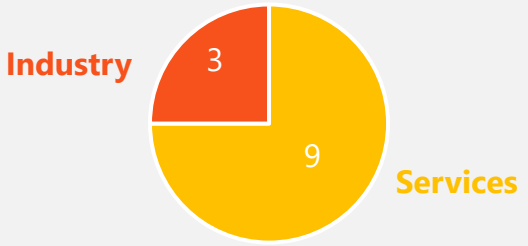
Brand



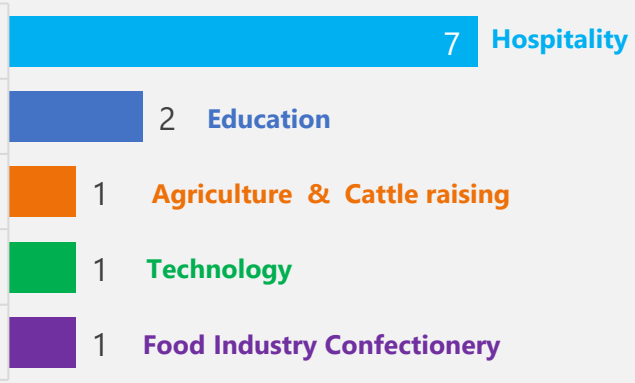
B2B Bulk LPG[1]

18 Valid Answers

Activity Type



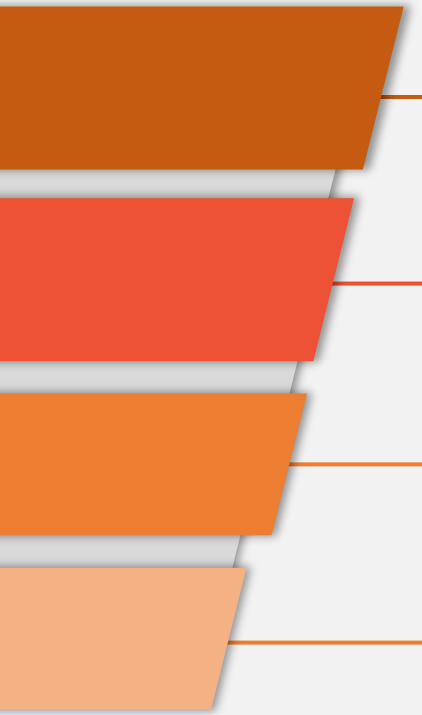
Activity Sector



Note: Quantitative Detailed Sample Overview in Appendix 4
Source: Quantitative Analysis, Qualtrics
[1]The reduced number of answers in the B2B Bulk LPG target limits the analysis to absolute values. Sample sizes were determined taking into account the universe size.

The value proposition was designed through best practices identified in the benchmark analysis and brainstorming, then it was adjusted according to the hypotheses tested

The value proposition approach was developed using the *Value Delivery System* Framework – oriented to value delivery by choosing, providing and communicating the value, the business strategy in a clearly defined way, since the value proposition **enables the identification of the benefits, including tangible and intangible, from the company to the potential customers, by purchasing the new product**[1]. The **constant coaction with the Galp's project team** enabled to develop a suitable value proposition, by providing fundamental insights about the LPG business, to be combined with the hypotheses testing.



BENCHMARK (Phase 1) | Analysis of national and international best practices in the LPG market and non-LPG sectors, such as FMCG and footwear, to develop a broad study.

BRAINSTORMING (Phase 2) | Revision of value proposition proposal, along with Galp's team, which included representatives of diverse areas of the LPG business, from the production (refinery) and sales, to the marketing and communication.

HYPOTHESES TESTING (Phase 2) | Perform Qualitative interviews to gather knowledge about the consumers' preferences and needs. To generalize the results, a quantitative study was developed to evaluate the value proposition.

NEW VALUE PROPOSITION (Phase 3) | Design of a new value proposition. Development of a projection plan for the financial impact, followed by the recommendations and respective implementation plan.

Source: [1]Lanning, M. & Michaels, E. , McKinsey Staff Paper, "*A Business is a Value Delivery System* " (1988)

3. Situation Analysis

I. **External Analysis**

II. **Internal Analysis**

Portuguese Government's sustainability commitments and customers' increased environmental concerns create conditions for the introduction of Bio LPG

POLITICAL

- The Portuguese Government committed to achieve carbon neutrality by 2050, as part of its compromise with the Paris Agreement.[1]
- Bottled LPG prices were regulated for the first time during the State of Emergency. However, they are not expected to be regulated in the future.[2]

ECONOMICAL

- Due to Covid-19 pandemic, the Portuguese GDP decreased 8%, in 2020. [7]
- In the context of a huge economic crisis, the IMF expects the unemployment rate to double to 14%. [7]
- The overall LPG market is falling around 3% annually. Auto LPG segment is growing 1% annually, while butane and propane Bottled LPG and the Bulk B2B LPG markets are falling. [3]

SOCIAL

- Consumers are more focused on the economic crisis than on environmental concerns. Even though 42% of the consumers search for sustainable products, only 12% are available to pay more for them.[3]
- 52% of the Portuguese claimed to have bought more products online in 2020 than in the previous year. 43% stated that they will keep this habit after the pandemic.[4]

TECHNOLOGICAL

CONSUMERS:

- 84% of the Portuguese citizens possess a smartphone. [8]
- Portuguese citizens have been increasingly enthusiastic about the download of free apps, namely brand apps. [9]

COMPANIES:

- Appearance of innovative technologies in the production processes of Bio LPG. [10]

LEGAL

- ERSE (*Entidade Reguladora dos Serviços Energéticos*) is the main regulatory body of the energy services in Portugal. [5]
- APETRO (*Associação Portuguesa de Empresas Petrolíferas*) is composed by the major energy companies operating in Portugal, and its mission is to foment the conditions for responsible, transparent, and sustainable operations in the energy fuels market. [6]

ENVIRONMENTAL

- Increasing demand for mobility alternatives with reduced CO_2 emissions, namely Auto LPG. [11]
- European Union is establishing goals for the reduction in carbon emissions to be achieved by its member countries towards a full decarbonization until 2050. [12]
- Increasing demand and regulatory push for the incorporation of renewable energies and advanced biofuels in various sectors of activity, namely transportation.[13]

Table 10: PESTLE Analysis

Sources: [1]Portuguese Government, [2&4]Observador, [3]Galp, [4]ERSE, [6&10]Apetro, [7]Jornal de Negócios, [8] Sapo, [9]Idealista, [11]Dinheiro Vivo, [12]McKinsey, [13]International Council on Clean Transportation

The Porter's Five Forces Model evidences that the biggest threat Galp faces for Bio LPG is the possible introduction of the product by current LPG competitors

Porter's Five Forces Analysis

Threat of New Entrants	**LPG: [1]** High capital requirements and economies of scale constitute a barrier to enter the market. Economies of scale are likely to arise due the spreading of fixed costs and to the company's purchasing power.[1] **[2]** Some brands, such as Galp, have high brand loyalty, which discourages possible entrants. **Accordingly, the threat of new entrants in the LPG market shall be considered low.** **Bio LPG: [1]** Some competitors have already made the commitment to produce Bio LPG. **[2]** Notwithstanding, these companies will produce the product in Spain and one of them does not have filling activities in Portugal. **[3]** Galp also has economies of scope by producing Bio LPG along with HVO, which few companies can have. **Thus, the threat of new entrants for the Bio LPG is moderate.**
Intensity of Rivalry	**LPG: [1]** On the Portuguese LPG market, there exist 6 large companies which have a solid position on the market, and the product is homogeneous. **[2]** Furthermore, the location assumes a very important role on the consumers' choice. **[3]** Additionally, some companies have a high customer loyalty. For instance, Galp has a high customer loyalty due to the partnership with Continente. Thus, it is a market on which it is hard for companies to gain market share. **Overall, the intensity of rivalry in the LPG market is moderate.** **Bio LPG:** As Bio LPG currently is not sold in Portugal, **the intensity of rivalry for the product should be considered low.**
Threat of Substitutes	**LPG: [1]** The extension of the Natural Gas network and electricity constitute the main threats to LPG, given their similar usages. **[2]** However, both these alternatives have a lower calorific power than LPG. **[3]** Electric cars pose a threat to the Auto LPG, given their low environmental impact and the growth of the network of charging points. **[4]** Although, all these alteratives require switching costs. **All in all, LPG has a moderate to high threat of substitutes.** **Bio LPG: [1]** Besides having LPG's possible substitutes, the conventional LPG also poses a threat to Bio LPG, as the products are chemically identical and changing requires no switching costs. **Accordingly, the threat of substitutes for Bio LPG is high.**
Bargaining Power of Buyers	**Bio LPG: [1]** The product has no differentiation and there exists considerable price information available. **[2]** On the other hand, individual customers represent a very small share of the brand's revenues and have some switiching costs. **Thus, Bio LPG customers have a low to moderate bargaining power.**
Bargaining Power of Suppliers	**Bio LPG**: **[1]** Galp depends on a small number of suppliers, which supply large quantitites of inputs, providing them some supply power. **[2]** Notwithstanding, given the quantities of inputs bought by Galp, it is a customer difficult to replace. **[3]** Additionally, Bio LPG can be produced using a wide variety of inputs, which reduces suppliers' bargaining power. **So, overall, the bargaining power of suppliers is moderate.**

Table 11: Porter's Five Forces.
Note: The LPG and Bio LPG markets were analysed separately when considered relevant.
Source: [1]Besanko, DBesanko, David, David Dranove, Scott Schaefer and Mark Shanley, 2013, The Economics of Strategy, 6th edition, New York: John Wiley and Sons

The pandemic challenged consumers behaviours and concerns, leading sustainability to be a growing priority on the executive agenda

COVID-19 drove an immediate shift in global priorities of the society. The pandemic emphasized the need for contingency plans, which **increased the urgency behind preparing for climate change.** People are willing to adopt **more sustainable and healthy behaviors**, but they do not know where to start[2] and companies are lagging on keeping up with these changes.

65%	67%	78%	77%	1/3	63%
Of consumers said that they will be **more mindful about the impact of their overall consumption in the "new normal"**[1].	Consumers are **more cautious about the scarcity of natural resources due to the COVID-19 crisis**[1].	Of consumers believe that **companies have a larger role to play in society**[1].	Of the companies said that their **sustainability strategies increase customer loyalty**[1]**.**	Of the organizations are recognizing the change in consumer preferences[1].	Of the companies that address the change in consumer preferences **increase their revenues**[1]**.**

Younger generations are more willing to make a significant effort to become more **environmentally friendly**[2], as 73% of Gen Z consumers state they are willing to pay more for sustainable items, with a significant part mentioning they would pay up to 10% more[3].

Sources: [1]Capgemini Report, [2]GlobeScan,[3] Bloomberg News

Galp is the market leader in the Portuguese LPG market, having Repsol and Rubis Gás as its main rivals

LPG Market Overview

500k **Amount of LPG consumed in Portugal in 2019.**

-3% Average annual growth rate of the **Portuguese LPG market.**

- This average has been **decreasing**, mainly due to **changes to natural gas and electricity.**

Targets	Dimension of the market[2]
Bottled LPG	**2 to 3 million** individual clients
Auto LPG	**50k** clients
Bulk B2B LPG	**9k** B2B clients

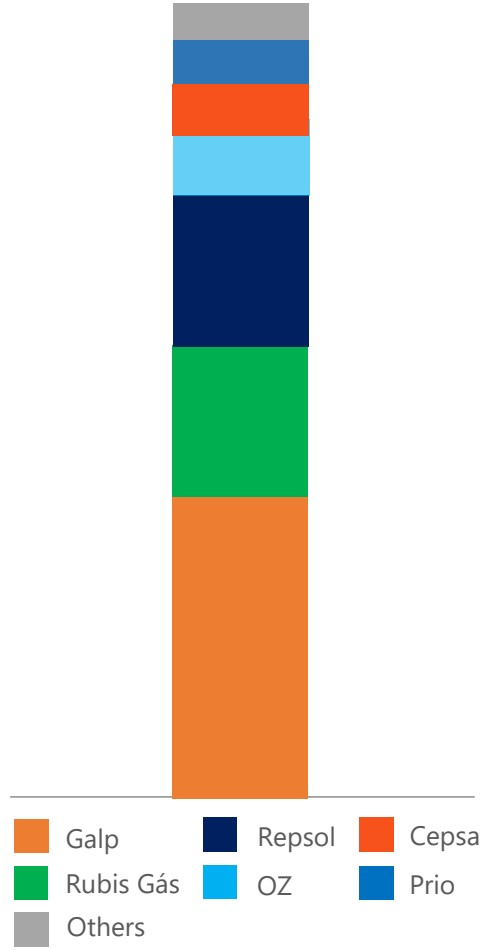
Table 12: Dimension of the market

LPG Competitive Positioning

The biggest players on the Portuguese LPG market can be classified on the following graph, according to the strength of their market presence and to the average price charged.

Graph 1: Position of Key players on the Portuguese LPG Market

LPG Market Share*



* Note: LPG market share was calculated based on quantities sold and it was provided by Galp, thus the values were hidden.
Sources: Information provided by Galp's project team

Galp faces fierce competition from Repsol, Cepsa, Rubis Gás, OZ, and Prio on the LPG market, with Repsol and Cepsa being the most likely competitors for Bio LPG

Detailed overview and analysis of Galp's main competitors:

REPSOL	The Spanish company Repsol was founded as Campsa in 1927, being currently present across 31 countries and having nearly 25k employees worldwide. Repsol started operating in Portugal in 1990, where it possesses **approximately 500 service stations**, with **Auto LPG available in 80 of them**.[1] The company, which supplies LPG in cylinders, bulk and Auto LPG, has made the commitment to reach net zero emissions in 2050. To do so, it **will build the first production unit of advanced biofuels with low emissions, in Cartagena. When concluded, in 2023, it will have an annual production capacity of 250k tonnes of biofuels, namely biopropane.**[1]
CEPSA	Cepsa, which is present in 21 countries, possesses **approximately 270 gas stations and 210 stores** (Depaso, Depaso Café and Mini Market) in Portugal. The company supplies Bulk and bottled LPG for both domestic and industrial usage, as well as Auto LPG. **Cepsa owns two refineries, La Rábida and Gibraltar-San Roque, capable of producing 180k tonnes of HVO.** One of its main strengths is the communication and design of its light cylinders.[2]
RUBiS GÁS	Rubis Gás belongs to the French group Rubis, founded in 1990, which currently operates in 41 countries[3]. Rubis does not possess any gas stations in Portugal but **does the supply of LPG at BP's gas stations**, after having bought BP's LPG business in 2014 for 115 million euros, in a deal which included former BP's storage and filling facilities[4]. In 2020, BP was the **second largest gas station network in Portugal, with 500 posts**[5]. Besides BP's Gas stations, **Rubis has approximately 10k points of sale in Portugal**.
OZ ENERGIA	OZ is a Portuguese company, fully owned by Manuel Champalimaud SGPS. The company possesses **approximately 5k points of sale and 120 stores [1], but only possesses 13 Gas Stations**, with 12 of them commercializing LPG cylinders, and 7 offering Auto LPG. OZ **owns a private Terminal at Trafaria** to import and store LPG. The terminal has a daily filling capacity equivalent to 1.5k propane cylinders of 45kg, and LPG storage capacity of 62k m^3 and approximately 1.2k m^3 of bottled products.[6]
prio	Prio was acquired by Disa Group, the fourth largest fuel company in Spain, in August 2020[2]. The company has a **low-cost strategy**, is the **largest producer of biofuels in Portugal**, and the third largest producer of Biodiesel from residual waste in Europe. Prio possesses **more than 2k points of sale** in Portugal, including **more than 250 Gas Stations**.[7]

Table 13: Competitive Environment in Portugal
Sources: [1]Repsol, [2]Cepsa, [3]Rubis Gás, [4]Público, [5]Jornal Económico, [6]OZ Energia, [7]Prio
Note: Further information about the Galp's competitor positioning in the Appendix 5.

Repsol and Cepsa's capacity to produce Bio LPG, well-known brands, and prices lower than Galp's pose the biggest threat to the company on this market

Detailed analysis of the threats posed by each of Galp's main competitors:

REPSOL	▪ **Charges a price lower than Galp.** ▪ Offers a **wide range of cards and discounts, for individual and B2B clients**[1]**.** ▪ Possesses **an extensive network of points of sale, and a strong online presence.** ▪ Has already made the **commitment to produce 12.5k tonnes of Bio LPG* through co-processing at its refinery of Cartagena**[1]**, starting in 2023.** ▪ **Well-known and international brand.**
CEPSA	▪ Has an **aggressive low-price strategy.** ▪ Is looking to **initiate its filling activities in Portugal**. ▪ Has the **capacity to produce 9k tonnes of Bio LPG* through co-processing on its refineries, in Spain.**[2] ▪ Aggressive commercial strategy, with the **offer of light cylinders**.[2] ▪ Well-known brand, being the **second largest player on the Spanish market.**
RUBIS GÁS	▪ **Extense network of points of sale.**[3] ▪ Part of an international group with **capacity to invest and buy large quantities of Bio LPG**.
OZ ENERGIA	▪ **Extense network of points of sale.** ▪ Possession of Trafaria's terminal, with a **considerable LPG storage and filling capacity**.[4]
prio	▪ **Aggressive low-price strategy.** ▪ Prio's recent acquisition by Disa group[5], **whose plans for Bio LPG are unknow by Galp.**

Table 14: Main threats to Galp posed by each of its competitors

*Value computed by applying the 5% rate of Bio LPG to the total quantity of HVO produced. The information provided by industry experts.

Sources: [1]Repsol, [2]Cepsa, [3]Rubis Gás, [4]OZ Energia, [5]Dinheiro Vivo

Note: Additional information about each competitor in the Appendix 6.

Galp is a major Portuguese energy company that operates in several business segments

Originally, **Galp brand was created in 1976**, but the company was refunded in 1999, under its current name: Galp Energia SGPS SA.

The company operates in the Oil & Gas sector, having businesses and **operations across different business segments, as Gas & Power, Refining & Distribution, and Exploration & Production**.

Forces

- Galp has been **operating in the Portuguese market for more than 40 years**, being the national **LPG Market leader** and offering various energies, to B2B and B2C clients.
- The company has available 4 plans of integrated offer with the **five energy sources and equipment**, delivering especial discounts and allowing the consumer to choose the one that better suits their needs. Galp's energy offer ranges from the **road to the home segments**.
- Given that Galp is already producing **around 4k tonnes of Bio LPG** annually in its Sines Refinery and only using a small part to incorporate it in their Auto LPG grid, the company can **invest in the recover of a higher part of this production** through co-production.

Geographies

Galp **exports for more than 50 countries** and has **operations in the following 11 countries**:

- Portugal
- Spain
- Brazil
- East Timor
- Angola
- Mozambique
- Cape Verde
- Guinea Bissau
- São Tomé and Príncipe
- Namibia
- Eswatini

Source: Galp

Galp's LPG offer comprises bottled, auto, bulk, and piped, that tackle different customer's needs, across the country

Bottled LPG

Target | Residential and small business establishments

Products | Butane | Propane

2.75Kg | 13Kg | *Pluma* 11Kg | 11Kg | 45Kg

Distribution | Around **700** service stations, **200** stores, **176** first-line resellers and **17k** second-line resellers.

Equipment

- Grills
- Interior heaters
- Exterior heaters
- Stoves
- Gas central heating
- Boilers and water heaters
- Camping stove

Auto LPG

Target | Personal vehicles and company fleets.

Product | Commercial **Propane Auto LPG.**

Distribution | Available in around **80** service stations across Portugal.

Bulk LPG

Target | Industry and large tertiary sector. Appropriate for off-grid users.

Product | Bulk LPG is composed of **Propane gas** that is supplied through tanks**.** The customer buys a determined amount of gas, that will be refilled when its over.

Distribution | Direct telephone contact with Galp's Gas Line, available 24/7.

Piped LPG

Target | Residential and small business establishments.

Product | The product, **Propane gas**, is available to consumers similarly to natural gas, through a pipe grid. The payment depends on the amount of gas consumed.

Distribution | Direct telephone contact with Galp's Gas Line, available 24/7.

Source: Galp

By leveraging its strengths and embracing external opportunities, Galp will be able to thrive in the Bio LPG market

SWOT Analysis

Strengths	**Weaknesses**
S1 – Galp is the LPG market leader. **S2 –** Biggest network of points of sale and nationwide online sales coverage. **S3 –** Trusted brand recognized by the portuguese consumers. **S4 –** Possibility to offer Bio LPG in a bundle, unlike Europe's top Bio LPG suppliers. **S5 –** Wide range of partnerships, namely exclusivity contracts with Continente, Pingo Doce and Auchan. **S6 –** Possibility of being pioneer in the Bio LPG market.	**W1 –** High-price offer, when compared to the LPG market. **W2 –** Insufficient knowledge regarding the final consumer and scarce involvement on sales, dependence on resellers. **W3 –** Low influence on online sales. **W4 –** Low investment in promotion of equipment in national events and professional sectors.
Opportunities	**Threats**
O1 – Growth of the sustainable energy sources market, specifically among younger consumers. **O2 –** Change of consumer habits due to Covid-19: preference for social outdoor activities, which can boost demand for outdoor heating devices and barbecues. **O3 –** Increase in incentives for the consumption of biofuels. **O4 –** Incentives to the production of Bio LPG. **O5 –** Considerable market of existing customers. **O6 –** Digitalization of the sector. **O7 –** Cross-selling of services and products. **O8 –** Enter in new markets (e.g. Marine)	**T1 –** Strong competition from other types of energy (natural gas and electricity). **T2 –** LPG market is expected to decrease, over the next years. **T3 –** Price sensitivity of the market. **T4 –** Scarce and expensive product in the European market. **T5 –** Presence of strong brands with aggressive low-cost strategies. **T6 –** Low barriers to entry on the Bio LPG market to existing competitors. **T7 –** Competitors are already co-processing Bio LPG, have planned production, or are participating in the carbon credits market. **T8 –** Perception of LPG as an unsafe product.

Internal

External

Table 15: SWOT Analysis

Galp can differentiate itself in the LPG market by the potentialization of the strengths with the current opportunities

TOWS Analysis	**Strengths** **S1 –** Strong position in the LPG market. **S2 –** Biggest network of points of sale and online sales. **S3 –** Trusted brand with high recognition. **S4 –** Possibility to offer Bio LPG in a bundle. **S5 –** Wide range of partnerships. **S6 –** Possibility of being pioneer in the Bio LPG market.	**Weaknesses** **W1 –** High-price offer. **W2 –** Insufficient knowledge regarding the final consumer and scarce involvement on sales. **W3 –** Low influence on online sales. **W4 –** Low investment in promotion of equipment.
Opportunities **O1 –** Growth of the sustainable energy sources market. **O2 –** Change of consumer habits due to Covid-19. **O3 –** Incentives for the consumption of biofuels. **O4 –** Incentives to the production of Bio LPG. **O5 –** Considerable market of existing customers. **O6 –** Rising digitalization of the sector **O7 –** Cross-selling of services and products **O8** – Enter in new markets (e.g. Marine)	**Strenghs + Opportunities** **(S1, S4 & S6 | O1, O2 & O4)** Galp can leverage its pioneer and strong position in the LPG market, to acquire new customers, by offering a wide range of consumption options. **(S2, S3 & S5 | O5 & O6)** Galp can take the advantage of being a well-known brand with a nationwide sales coverage to reach the wide market and strongly communicate the product, specifically on digital channels.	**Weaknesses + Opportunities** **(W1 | O1, O3 & O4)** By diversifying its offer with a sustainable LPG product, Galp justifies its prices and also positions itself in the market with a competitive advantage. **(W3 & W4 | O6 & O7)** With the growing digitalization and cross-selling, Galp can easily invest in improving its e-commerce presence and promotion actions.
Threats **T1 –** Strong competition from other sources of energy. **T2 –** LPG market is expected to decrease. **T3 –** Price sensitivity of the market. **T4 –** Scarce and expensive product in the European market. **T5 –** Presence of strong brands with competitive strategies. **T6 –** Low barriers to entry on the Bio LPG market. **T7 –** Competitors are already co-processing Bio LPG. **T8 –** Perception of LPG as an unsafe product.	**Strenghs + Threats** **(S1, S2 & S3 | T3, T5 & T7)** Galp's strong position in the market and high recognition can fade the competition. **(S4 | T1 & T5)** Galp can leverage its position by supplying integrated offer options. **(S6 | T2, T6 & T7)** The first movers advantage is crucial for the company to establish brand and product recognition, as well as face the LPG market shrinkage.	**Threats + Weaknesses** **(W1 | T2, T3 & T5)** The high price charged by Galp and the lack of differentiation can lead to losing relevance in the market, and consequently demand. **(W3 & W4 | T2 & T5)** The lack of positioning in additional advantages for the customers, such as the online purchase and the announcement of complementary equipment, it can intensify the decrease of the market and the acquisition of market share by other companies.

Table 16: TOWS Analysis

4. Benchmark

I. **Production Processes**

II. **International Benchmark**

III. **Non-LPG Benchmark**

Among the diverse types of production, Hydrtotreating is the only one being commercialized

Bio LPG can be produced through 7 different processes:

Conventional Chemical	1	**Hydrotreating**
	2	**Dehydration**
Biological	3	**Fermentation**
	4	**Hydrolysis and fermentation of cellulose**
	5	**Digestion of organic waste**
Advanced Chemical	6	**Gaseous conversion**
	7	**Liquid conversion and synthesis**

☐ Key Production Processes that will be analysed in detail

* Values as of 2018, with 100K kilotonnes having been branded as such for sale, and the remaining 100K having been used for internal consumption.

Sources: MDPI – "Process Technologies and Projects for Bio LPG" , WLPGA and Atlantic Consulting.

Note: Further details in the Appendix 7.

HYDROTREATING

Bio LPG can be produced in conventional refineries, which co-process bio-oils together with petroleum intermediates, or in HVO units where the Bio LPG is a sub-product. The process converts bio-oils to biofuel, often called HVO.

Total Production: 200k tonnes*.

Feedstock:

- Bio fatty acids along with bio-oils;
- Biopropylene;
- Biobutylenes;
- Dimethyl ether (DME).

Technical Readiness: Hydrotreating is a mature process, being the only process already in a commercial stage. Nearly 30 commercial projects exist worldwide.

Companies that use the hydrotreating process

Dehydration and dygestion of organic waste are emerging in the market as potential methods to produce Bio LPG

EMERGING PRODUCTION PROCESSES

DEHYDRATION

Dehydration is already being used by 3 operators to **produce minor quantities of Bio LPG, specifically biopropane, as a co-product.**

Feedstock:

- Petrobras and Tesoro are reportedly using bio-oils in conventional refineries.
- Renewable Energy Group is investigating the production of 65k tonnes/year of biopropane from glycerin.

Technical Readiness: The process is **mature but it is at a pilot demonstration level.**

Companies that use the dehydration process

DIGESTION OF ORGANIC WASTE

The output of production is commonly 50% methane, and the other 50% are composed of carbon dioxide.

The Biogas can be used for combustion on site or cleaned and upgraded to **Biomethane**.

Feedstock:

- **Organic wastes with high water content**, such as manure.

Technical Readiness: The process is still at a conceptual stage. **Flogas is already using a propane enriched biomethane**.

Companies that use the digestion process

Sources: MDPI – "Process Technologies and Projects for BioLPG", WLPGA and Atlantic Consulting

In Europe, companies have increasingly chosen Bio LPG as a direct substitute of the conventional LPG, along with the objective to achieve defined sustainable goals

- The Bio LPG market is expected to have a **CAGR of 47.1% from 2020 to 2027**[1].
- Increased environmental concerns, due to the high CO_2 emissions and climate changes, **enhance the demand and supply of Bio LPG**.
- It is estimated that **global LPG production will reach 300k tonnes in 2022**[2].

Overview of the key players in the Bio LPG market

Graph 2: Overview of the key European players in the Bio LPG market.

Companies that belong to the same group.

* CAGR – Compound Annual Growth Rate
Sources: [1]Acumen Research and Consulting, [2]WLPGA
Note: Further Details about the Repsol in the Appendix 8 and the ECB Group in the Appendix 9

Repsol has invested in a new production facility to start producing Bio LPG, in Spain, until 2023

Potential production in 2023

REPSOL

Biopropane: 12.5k tonnes annually*.

Cartagena Refinery:

- Co-processing of HVO;
- From recycled materials[1].

bp

Bio LPG: 4k tonnes annually*.

Castellón Refinery:

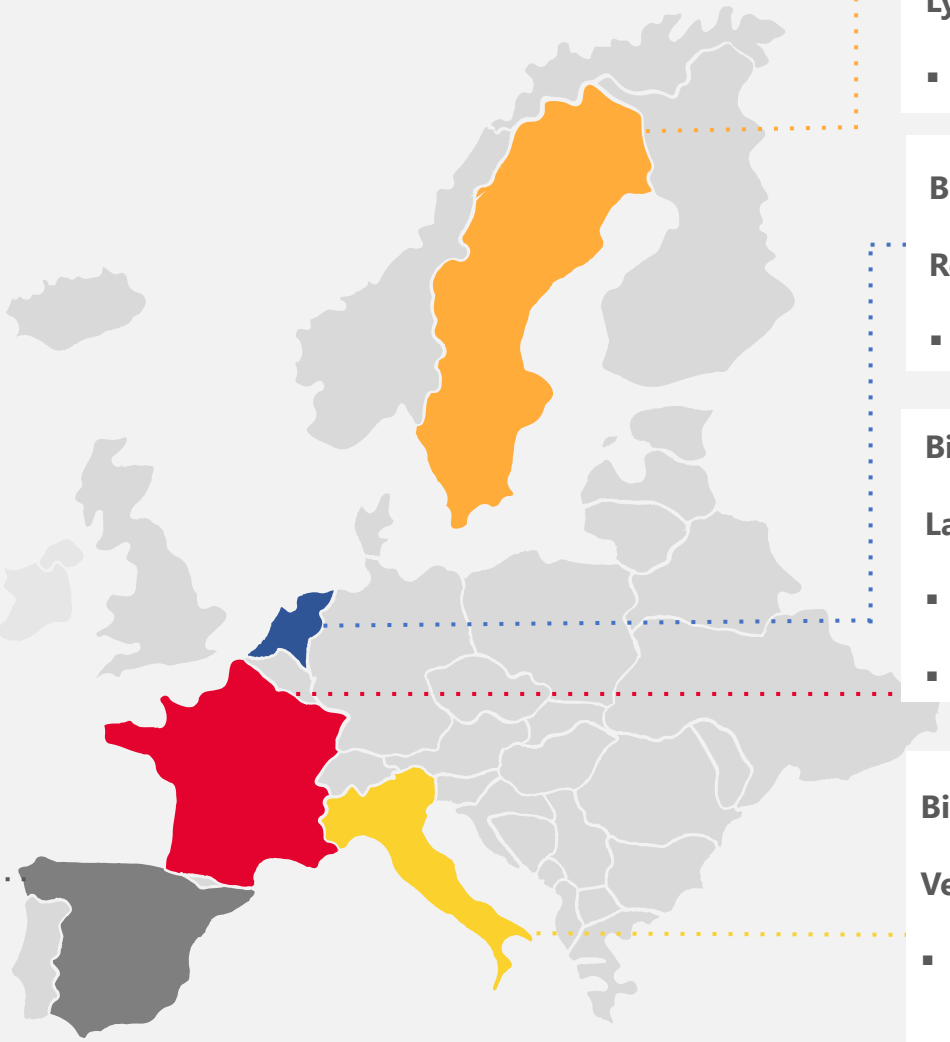
- Co-processing of HVO[2].

CEPSA

Bio LPG: 9k tonnes annually*.

La Rábida and San Roque Refineries:

- Co-processing of HVO[3].



preem

Bio LPG: 15k tonnes annually.

Lysekil and Gothemburg Refineries:

- Co-processing of HVO and Hydrogeneration[4].

NESTE

Biopropane: 40k tonnes annually.

Rotterdam Refinery:

- NEXBTL production process[5].

TOTAL

Bio LPG: 25k tonnes annually*.

La Mède Biorefinery:

- Vegan production process;
- Crude vegetable oil and treated waste[6].

eni

Bio LPG: 14k tonnes annually.

Venice and Gela Biorefineries:

- Ecofining production process, from food wastes, used oils, and animal fats[7].

*Computed by applying a 5% rate to the total HVO production of the company
Source: [1]Repsol, [2]BP, [3]Cepsa, [4]Preem, [5]Neste, [6]Total, [7]Eni

Neste positions itself as the number one biopropane producer in the world, supplying 40k tonnes of Biopropane to 9 countries, through SHV Energy

NESTE

Neste is the world **number one producer of biopropane[1].** It started its production and sale in 2018, in the world's first biorefinery. The company supplies biopropane in 9 countries, through SHV Energy.[1] The company has the capacity of producing **40k tonnes of Biopropane[2] per year.** The amount produced will be sold in the European Market.

The biopropane is generated as a co-product of the production of other fuels, through a hydrotreating process, based on a propane rich mixture. The process is developed under the **NEXBTL**[1] technology.

Neste partnered with SHV, for 4 years, to distribute the Bio LPG produced in the Rotterdam refinery. Oakland's (USA) restaurants **supply used oils to be refined and used in the city's public transports**[1].

SHV ENERGY

SHV Energy is a dutch company that leads the Bio LPG distribution. The company's business model is decentralized, **working through subsidiaries to personalize its offering** to each one of the 25 countries in which it operates.[3]

CALOR — Responsible distribution in the UK and Ireland.

PRIMAGAZ — Distributes in the Netherlands, Denmark, Sweden, Germany, Czech Republic, Belgium, France and Spain.

The distribution is done under the **mass balance principle[3]**.

As Bio LPG and convencional LPG present the same chemical structure, they can be mixed in the same distribution grid, improving the efficiency of the distribution.

Sources: [1]Neste, [2]LPGas, [3]SHV Energy
Note: Detailed analysis of each company in Appendix 10

Calor[UK] presents a potential for growth in the Bio LPG Market, mainly due to the government incentives

CALOR UK & IE

Calor distributes and commercializes LPG and Bio LPG in Great Britain and Ireland. It belongs to the dutch group SHV. The company received **58k tonnes of Bio LPG** until July of 2020, saving approximately 86k tonnes of CO_2 [1].

For **household sector**, it offers a **Green Energy Plan**, which consists of a mixture:

40% of Bio LPG[1] + **60%** of LPG[1]

For **professional sector**, every drop of Bio LPG is counted and mixed with LPG, then a **Green Gas Certification** is distributed[1].

Bio LPG was approved by the UK and Ireland's governments as a sustainable renewable fuel, which is exempt from carbon tax.

ADDITIONAL FORCES

- **OFFER**

Wide portfolio of Bio LPG products and services: Bottled, Bulk and Auto.

- **DIGITAL**

Highly **informational easy to navigate** website[1].

- **SUPPORT SERVICES**

Provides **out-of-hours emergency** and **maintenance** service[1].

- **PARTERNSHIPS**

Wide variety of partnerships with **local businesses.**

EXAMPLES

St Tola Irish Goat Cheese

Produces local **goat cheese** and uses Bio LPG for water boiling and heating[1].

BrookLodge & Macreddin Vilage ★★★★

Switched to Bio LPG 100% renewable energy for the pools, spa, floor heating and kitchens[1].

Sources: [1]Calor UK
Note: Further information about the Bio LPG with a national analysis (UK) with the peer Flogas in the Appendix 11

Primagaz[FR] has a strong business strategy aligned with sustainability, offering an extensive catalogue of Bio LPG to consumers

PRIMAGAZ FR

Primagaz is a leading supplier of national LPG distribution in France, and belongs to the SHV group. The company distributes via **industrial and residential partnerships**, mainly through the Avia distribution network[1]. Launched the **Primagaz Next** concept, which defines the **society's energy transition to 100% renewable in 2040** as the company's current mission[1].

ADDITIONAL FORCES

- Regular **price promotions** on the purchase of gas cylinders.
- **Sponsorship Gas Tank**, the sponsor earns 100€ and give 100€ to the new customer, in form of gas credit[3].
- Involved in **sustainable projects**, for instance, Ekodev (installation of beehives in the top of offices)[3].

BIO LPG OFFERS

BIO AUTO LPG

Distributed by several service station partners, in which **12.5 liters of LPG Auto incorporates 8% of biogas**[1].

BULK BIO LPG

Provides biopropane tanks for **private households**, but also for **professional** use and **public sector**.

BOTTLED BIO LPG

Available Options: **Bio Twiny** (5.1kg) with **100%** of biopropane, with a price of refill of 18.90€ (3.72€ per kg)[2]; and other with **20%** of biopropane (13kg) with a price of refill of 29.99€ (2.31€ per kg)[2].

- With the switch from Twiny (Conventional LPG) to Bio LPG Twiny, the **sales increased by 19%, in 2020[1]**.

Note: Further information about the Bio LPG with a national analysis (France) with the peer Butagaz in the Appendix 12 and Bulk Bio LPG Offer of Primagaz FR in the Appendix 13.
Sources: [1]Primagaz France, [2]Le Propane

Primagaz^{BE} bets on offering an extent distribution of retailers and integrated the Bio LPG products with digitalization

PRIMAGAZ BE

Primagaz^{BE} is a exclusive supplier of bioproprane in Belgium, and the company has the ambition to **distribute only biopropane by 2040**. he company is a subsidiary of the SHV group. To ensure distribution, it has several storage locations across the country. Through **partnerships with gas stations and retailers**, for example Bico - a bricolage retailer, Primagaz^{BE} has **1,040 points of sale**, where **35% sell the option of Bio LPG**[1].

BIO LPG OFFER

BOTTLED BIO LPG

Offers lighter cylinders of the **EasyBlue** range with **100% Bioproprane**, available in two sizes:

EasyBlue PLUS
6kg of Biopropane
Price of Refill:
25.65€*[2]
4.28€ per kg

EasyBlue XL
9.5kg of Biopropane
Price of Refill:
35.70€*[2]
2.21€ per kg

CLIENT'S TESTIMONALS

CLAMOTTE ROCK

In 2019, Clamotte Rock opted for biopropane as the main gas for a **more ecological festival**, which **reduced 80% of CO_2 emissions**[1].

EXTRA FEATURE

The mediator **Primagaz EasyBlueTM Level app** enables the consumers to easily measure the quantity of gas in the EasyBlue cylinder, using a app in the smartphone[1].

* Incl. VAT, related to 03/02/2021.
Sources: [1]Primagaz Belgium, [2]Henrotte

Flogas focuses its mission on providing an efficient distribution service, to ensure nationwide coverage at competitive prices, while reducing its carbon emissions

Flogas is a subsidiary of the DCC group[1] **and the second-largest player in the UK domestic bulk LPG market[2].**

The company provides LPG supply, as well as electricity. Flogas does not provide Bio LPG, but LNG.

PARTNERSHIPS

Flogas partnered with **Future Biogas,** one of the largest producers of biogas in the UK, to produce propane enriched Biomethane. Propane is necessary in order to mix the Biomethane into the LPG grid, ensuring an optimum system performance.

The refinery can process **4k tonnes of organic waste**[3].

LNG

LNG is produced by a 45-day **anaerobic digestion process.**

The Biogas reduces carbon emissions by 80%.[4]

Applications: the Biogas can be used in businesses with continuous energy-intensive manufacturing, industrial processes and transportation.

ADDITIONAL FORCES

- Flogas' **prices are lower than other competitors** in the LPG market, such as Calor*.
- **Biggest nationwide coverage,** with around 1,800 points of sale
- Involved in **carbon offsetting projects,** such as Nafa Naana, in Burkina Faso[3].
- Supplies a **specialized offer** for dairy producers, with high-temperature performance.
- Possibility to supply LPG in **an integrated offer plan**, unlike others specialized players.
- Strong **online presence.**

Note: Further information about the Bio LPG with a national analysis (UK) with the peer Calor in the Appendix 11.
Sources: [1]DCC, [2]The Irish Times,[3]Flogas.

Butagaz offers a wide portfolio of sustainable fuels at competitive prices, supplying Bio LPG in both cylinders and tanks

Butagaz

DCC subsidiary, Butagaz leads the distribution of bottled LPG and the second in Bio LPG distribution, after Primagaz, in the **French market**[2]. Butagaz has invested **in turning its portfolio greener with** biopropane, biobutane, biomethane and green electricity

BIO LPG

Butagaz Bio LPG has **6.5k** points of sale in France. Conventional LPG is supplied in 25k locations[1]. The company developed innovative solutions to buy cylinders, such as the **Cylinder vending machine,** an automatic gas cylinder dispenser, available 24/7. In 2020, the weight of green gas sales in total gas sales rose from 0.17% to 2%.

ADDITIONAL FORCES

- The production is made from vegetable oil and it **has been certified by the ISCC PLUS**[1]**, ensuring a sustainable supply chain**.
- Butagaz offers personalized offers according to customer's preferences, **with more competitive prices and aligned to their environmental concerns**[1]**.**

PRODUCTS

BOTTLED BIO LPG

Viseo Biobutane 10kg:

- 20% Bio LPG*
- Level indicator
- Light cylinder
- Price: 25.90€ [3](2.59€ per kg)

Butane 13kg:

- Traditional metal cylinder
- Price: 33.50 € [3] (2.58€ per kg)
- Suitable for house use

BULK BIO LPG

IDEO package	20% Biopropane	1.874€/tn [4]
	20% Biopropane	2.029€/tn [4]
ÉcoConfortique	100% Biopropane	Fixed monthly payments [4] *

Table 17: Butagaz Bulk LPG Prices

Price of conventional Propane: 1.784€/tn[3].

Note: Further information about the Bio LPG with a national analysis (France) with the peer Primagaz FR in the Appendix 12
Sources: Butagaz, [2] Euronext, [3]Selectra, [4] LePropane
*Bio LPG distribution is done under the mass balance principle

AvantiGas is one of the leading LPG suppliers in the UK, presenting a diversified Bio LPG offer and providing highly valued delivery and maintenance services

AVANTIGAS

Established in 2011, after *UGI Corporation* had acquired Royal Dutch Shell's LPG distribution business, AvantiGas is one of the **leading suppliers of LPG in the UK**.

LPG AND BIO LPG OFFER

- The LPG is commercialized in tanks and cylinders, with **the bottled LPG being sold in cylinders of 6kg, 11kg, 18kg, 19kg and 47kg**.
- The Bio LPG marketed by AvantisGas is a **subproduct resulting from the production of HVO.**
- The Bio LPG is sold in 3 different proportions: **20%, 50%, or 100% Bio LPG.**

ADDITIONAL FORCES

UK-based emergency call-center that delivers maintenance, service, and aftercare, **available 24/7**.

Online order of LPG cylinders, review historical consumption, access online payments, billing, and check order status.

Provides a price match challenge, offering competitive prices with different payment options, fixed or flexible.

Possibility to **compute the annual reduction in Carbon emissions resulting from the usage of Bio LPG**.

Emission of a CO_2 Certificate guaranteeing that carbon emissions were reduced according to the Bio LPG acquired.

AvantiGas provides the distribution **and delivery under its own brand name.**

Source: AvantiGas, Royal Dutch Shell

Kosan Gas stands out in the LPG market due to its significant industry expertise, a large network of corporate clients, and convenient service offer

- Kosan Gas **is the largest LPG supplier in the Nordic countries,** having more than 5k corporate clients, and selling LPG and Bio LPG produced by Preem.
- In 2019, it had **60% market share in the Danish bottled LPG market**[1].

LPG AND BIO LPG OFFER

- Kosan's distribution is based on a **certificate's compensation method called Kosan Mix**: This method ensures the customer that the quantity purchased of Bio LPG will be used for internal consumption in the refinery, while consumer receives the full amount purchased of LPG.
- The Bio LPG is marketed in four different proportions: **20%, 30%, 40%, and 100% Bio LPG.**

ADDITIONAL FORCES

Possession of **119 self-service stores in Denmark,** opened 24/7, where the customer can buy, fill, and change LPG cylinders of 5kg, 10kg, and 11kg[3].

Possibility to **subscribe a daily newsletter** to receive updated news, offers, and recipes.

Possibility to **compute the annual reduction in Carbon emissions resulting from the usage of Bio LPG**.

Sharing B2B clients' success stories with the product on its website, and of the emissions saved resulting from the usage.

Source: KosanGas
Note: Further information about the Bio LPG with a national analysis (Denmark) with the peer Primagaz DK in the Appendix 14.

Eni, Preem, and Total have invested to adapt conventional refineries and to construct new biorefineries to the production of biofuels

- **Eni** is an Italian LPG producer and distributor **committed to the production of sustainable biofuels.**[1]
- Its biorefinery of Venice became the **first conventional refinery in the world to be converted.** The company processes annually **230k tonnes** of vegetable oil into biofuels.[1]
- Eni also possesses the biorefinery of Gela, which has an **annual processing capacity of 750k tonnes** of used vegetable oil.[1]
- Eni's current production capacity of **Bio LPG from biomass is around 14k tonnes**.[1]

- Preem is **the largest fuel company in Sweden,** accounting for 80% of the Swedish refining capacity.[2]
- Preem's **Bio LPG is produced from hydrogeneration and co-processing.** The Bio LPG is **marketed by Kosan Gas** [4]**.**
- The company has invested on its refineries of Gothenburg and Lysekil**. In Gothenburg, the capacity to produce renewable diesel increased by 40%,** while at Lysekil, Preem **can now process up to 40% of raw materials.**[2]

- Total is **the leading distributor of Biofuels in Europe.**[3]
- **Total's Bio LPG is a sub product of the co-processing the production of HVO.** The company has an **annual production of 500k tonnes of HVO** at its biorefinery of La Mède, and thus, a **Bio LPG annual production capacity of approximately 25k tonnes*.**[4]
- La Mède biorefinery became operational in 2019 and resulted from an investment of **€275 million.** The conversion project lasted four years.[3]

Sources: [1]Eni, [2]Preem, [3]Total, [4]WLPGA and Atlantic Consulting
Note: Further details about Eni in the Appendix 15, about Preem the Appendix 16, and about Total in the Appendix 17.
*Computed by applying a 5% rate to the total HVO production of the company

Repsol and ECB Group will enter the biofuels market, in the short-term, through the construction of their first biorefining complex, posing a major threat to Galp

- **Repsol is a Spanish company** in the energy sector that **produces, refines, and generates energy**.
- Its main objective, in order to be a sustainable company, is to **increase the production of high-quality biofuels derived from HVO, as Bio LPG**, by 600k tonnes until 2030.

- The Brazilian company **ECB Group is the biggest biodiesel producer in Brazil**, with an annual capacity of 828 million liters.
- In 2019, **ECB Group and the government of Paraguay come to an agreement to launch the project Omega Green**, the biggest private investment in the history of the country.

BIOREFINERY OF CARTAGENA

Repsol will build **the first production unit of advanced biofuels** with low emissions, in Cartagena, with an expected investment of around **€188M**, allowing to **process recycled materials** and **reducing about 900k tonnes of CO_2 emissions**.

When concluded, in **2023**, it will have capacity to an annual production of **250k tonnes of biofuels**, as biojet and **Biopropane**.

BIOREFINERY OMEGA GREEN

Biorefinery Omega Green is going to be built in near Asunción, until 2024, with a total estimated cost of **US$ 800 million**. It will be the first advanced biofuels production plant in southern hemisphere.

The biorefinery will have a production capacity of 20k barrels per day (around 1.15 million m^3 annually), combining different biofuels. The **expected annual Bio LPG production is around 57.5k m^3**.

Source: Repsol, ECB Group

Through the analysis of the benchmark, best practices of the market were identified and considered in the next phase of the project, the development of the value proposition

Key findings	Best Practices	Examples:
Differentiated Characteristics in the Bio LPG Cylinders	Common practices to distinguish the cylinders from conventional LPG ones, such as **less capacity**, **lighter cylinders**, more appealing **design** and **digital features**.	PRIMAGAZ  Lighter and digital app
Minimum incorporation of 20% of Bio LPG	The principal targets for the incorporation of Bio LPG are the **Bottled** and the **Bulk LPG**, where the typical **minimum of incorporation is 20% of Bio LPG**, followed by a medium quantity of **30%** or **40%**, and in certain companies, there is offered **100%** Bio LPG, mainly in the cylinders.	PRIMAGAZ -100% Bio Twiny (5.1kg) -20% of biopropane (13kg)
Online customer experience	Integration of the digital in the customer journey through the **online purchases**, which includes the online payment methods and billing; **account management**, through the client's account on the website and app of the company; **highly informational** online platforms, with user-friendly navigation.	AVANTIGAS Online order of LPG cylinders and other online services.
New distribution channels	Expansion of the distribution channels with **innovative processes and locations**, in order to be closer to the final consumer and to provide a convenient and accessible offer to the customer.	Butagaz Cylinder vending machine
Partnerships	Focus on partnering with local businesses and events of social and sports theme. The companies report the **experience of these partners in shifting to the Bio LPG** and the **impact caused by this change**, for example the emissions of CO_2 saved. Also, regarding the local businesses, Bio LPG **helps them achieving sustainable goals.**	CALOR Local Producer of goat cheese
Carbon Offsetting Projects	Involvement on carbon offsetting projects to **promote the energy transition of the world**. These projects cover certain locations, mainly in developing countries, with specific actions, as the donation of solar pannels.	FLOGAS Nafa Naana – provides LPG stoves, in Burkina Faso
Law of Integrated Offer	Most of the companies are **specialized in the LPG market**, whose offer does **not combine other types of energy sources.**	FLOGAS Diverse portfolio of energies

Table 18: Key findings of the best practices from the benchmark analysis
Source: Benchmark Analysis
Note: Further Analysis of Non-LPG sector was conducted and is available in the Appendix 18.

6. Hypotheses Testing

I. **Bottled LPG**

II. **Auto LPG**

III. **Bulk B2B LPG**

The qualitative and quantitative analysis lead to the validation of 3 key personas: the convenience seekers, price seekers and trust seekers

KEY PERSONAS

CONVENIENCE SEEKERS

QL – 7 of 16 interviewees | QT - 36% of the sample

- Driven by **low-effort** and **simplicity**.
- Price is not a priority.
- Strongly value **proximity** when choosing a provider.
- Enjoy convenience-enhancing services, that provide a smoother purchasing experience.

PRICE SEEKERS

QL – 5 of 16 interviewees | QT - 35% of the sample

- Exclusively driven by the **price.** Value **discount-based** services.
- **Prioritize price** over sustainability.
- **High willingness to change** brands at the same price.

TRUST SEEKERS

QL – 2 of 16 interviewees | QT - 13% of the sample

- Driven by **brand trust** when choosing a provider.
- **High involvement with provider.** No willingness to change.
- **Loyal** to providers that ensure **high quality** products.

NO PROBLEM SEEKER

QL – 2 of 16 interviewees | QT - 0% of the sample

- Search for **performance-oriented** consumption options.
- Value the **trustworthiness** of the provider.
- **Low involvement** with provider.

Representative Personas validated in the Quantitative Analysis

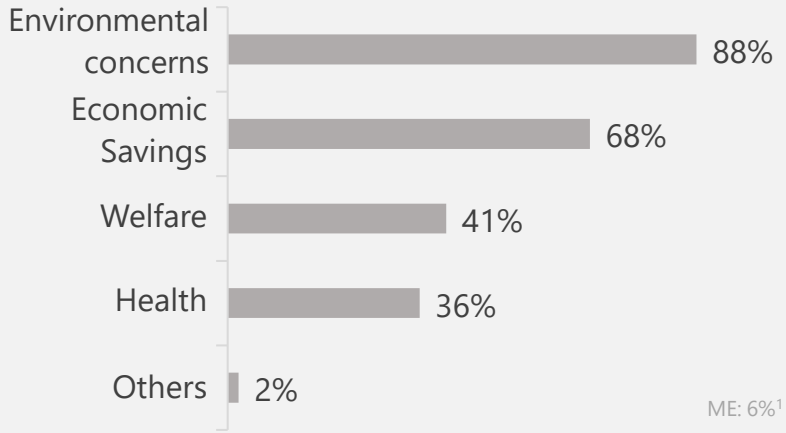
Source: Qualitative Analysis and Quantitative Questionnaire Bottled LPG, Qualtrics
Note: Questionnaires used for each analysis in the Appendix 21 and the Qualitative Analysis in the Appendix 22. Further Research about the Key Personas Validation in the Appendix 28.

The LPG consumer reveals to be concerned with the environmental impact of its consumption and to value convenience in its brand choice

Sustainability Profile

298 responses; ME 6%[1]

Reasons to adopt sustainable behaviours



ME: 6%[1]

The majority of respondents exhibit a sustainable profile (**65%**) mainly due to environmental (**88%**) and economic (**68%**) concerns. **93%** of the sample believes the introduction of a sustainable product improves a brand's image and **64%** state that the word sustainable is more environmentally friendly than green and bio.

LPG User Profile

MAIN DECISION DRIVERS

Multiple Choice

37% Only pay for the amount consumed

35% Transportability

32% Cooking on a gas stove

ME: 6%[1]

MAIN FACTORS IN BRAND CHOICE

Multiple Choice

55% **Proximity**

29% Brand Trust

26% Price

ME: 6%[1]

MAIN FACTORS PER BRAND

	Proximity 51%	Trust 40%	Quality 23%	
galp				ME: 7%[1]
RUBiS GÁS	Proximity 69%	Known Reseller 31%	Price 26%	ME: 16%[1]
REPSOL	Proximity 63%	Price 37%	Reductor[2] 26%	ME: 17%[1]

Table 19: Main decision factors per brand, Bottled LPG

*Sustainable Profile based on how many selected options in Q4 of the qualitative bottled LPG interview script
[2]Already has the reductor
Source: Quantitative Questionnaire Bottled LPG, Qualtrics; [1] SurveyMonkey (with a confidence level of 95%)

The majority of the sample exhibits a high interest in the product and willingness to consume Bio LPG in its current brand, despite the lack of prior knowledge

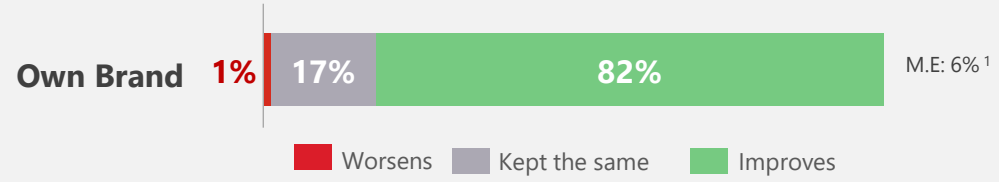
Previous knowledge about Bio LPG

20% PREVIOUS KNOWLEDGE

80% NO PREVIOUS KNOWLEDGE

M.E: 6% [1]

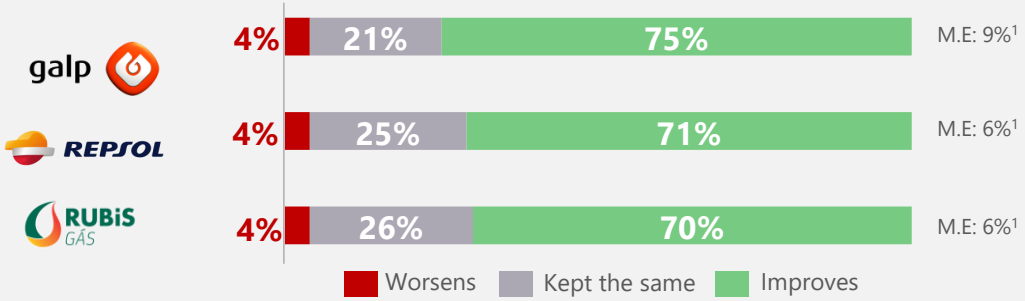
Perceived change in brand's image by the consumers[5]



For Galp's customers:

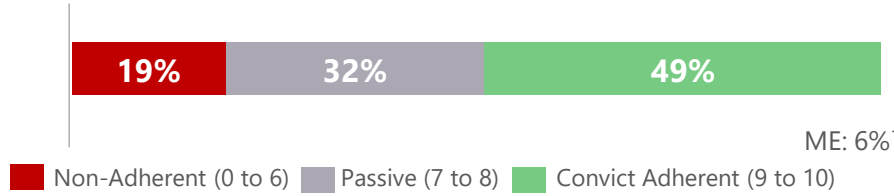
galp **81%** assume an improvement — M.E: 7%[1]

On other brands' image:

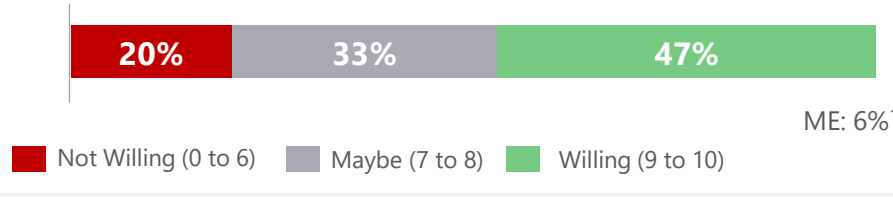


WITHOUT PRICE KNOWLEDGE

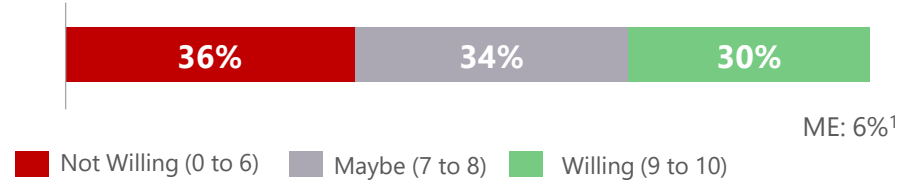
Demonstrated interest on the Bio LPG



Willingness to buy Bio LPG on the current brand



Willingness to change brand to buy Bio LPG

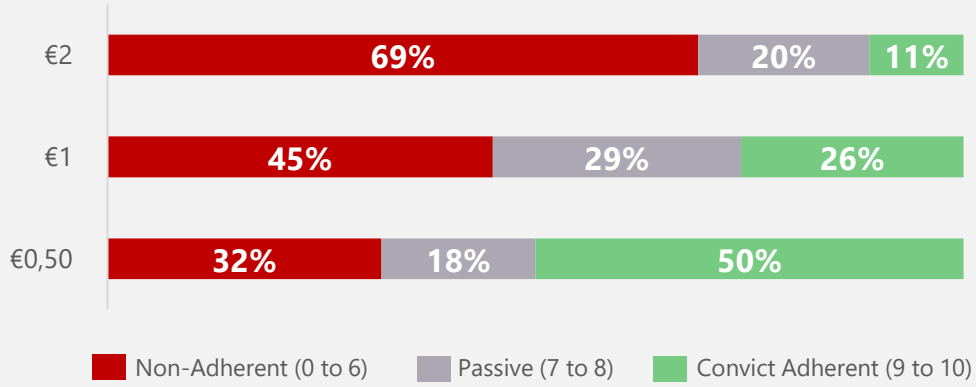


- **47%** of the sample is **willing to consume Bio LPG in their own brand** and **30%** are willing to switch brands.

Source: Quantitative Questionnaire Bottled LPG, Qualtrics; [1] SurveyMonkey (with a confidence level of 95%)

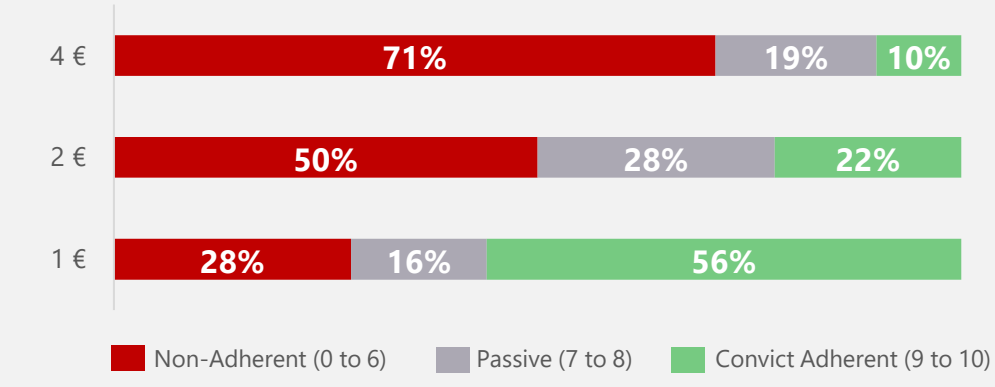
Consumers are not willing to pay a high premium to buy Bio LPG, but they are interested in higher Bio LPG incorporations

Small Cylinders | Price Increase Scenario[1]



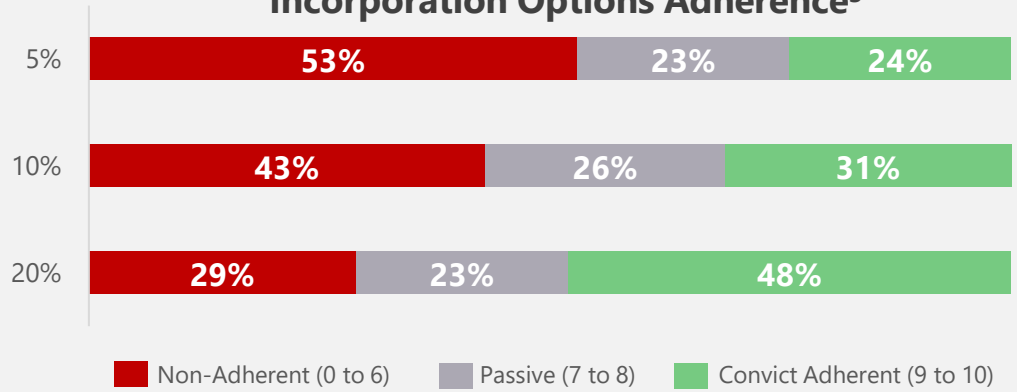
ME: 7% [1]

Big Cylinders | Price Increase Scenario[2]



ME: 10% [1]

Incorporation Options Adherence[3]

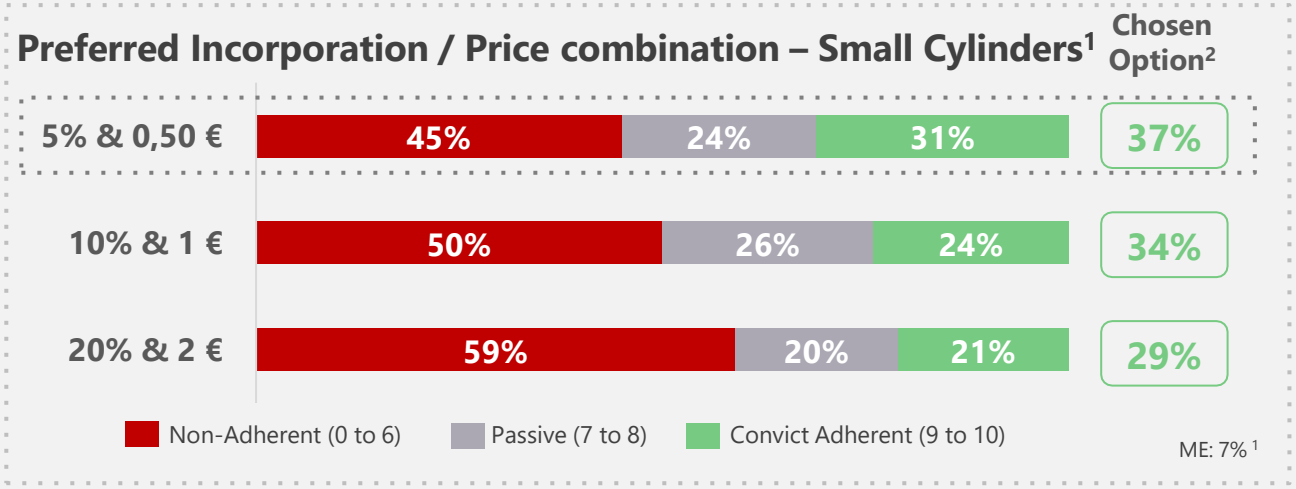


ME: 6% [1]

- Both small cylinders and big cylinders users reveal a **higher adherence to a lower price increment.**
- When choosing a Bio LPG incorporation, the sample shows a **higher preference for the 20% option, the highest amount.**
- We can conclude that, when **excluding the price** from the scenario, **consumers seek for a more sustainable option.**
- **36%** of the sample would be willing to **change brands** to consume Bio LPG at the same price

Source: Quantitative Questionnaire Bottled LPG, Qualtrics; [1] SurveyMonkey (with a confidence level of 95%)

Respondents have a higher adherence to the less expensive option with a lower percentage of Bio LPG, showing a more price-driven than sustainability-driven profile



Own Brand | **50%** Would consume the product for sure.

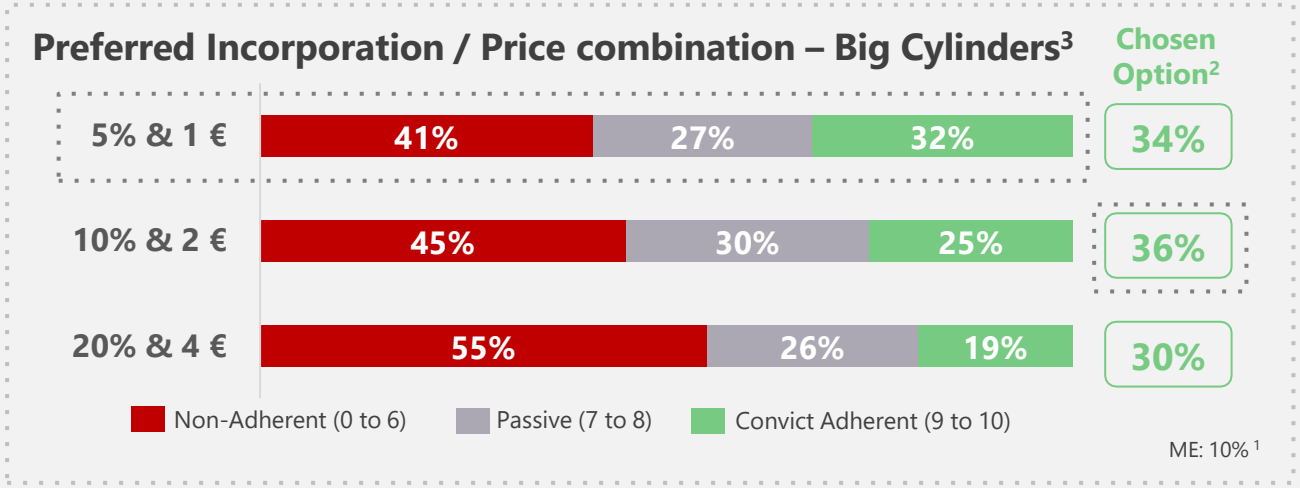
49% of Galp clients would consume Bio LPG.

In another brand:

galp **32%** Would consume the product.

REPSOL **24%** Would consume the product.

RUBiS GÁS **20%** Would consume the product.



Own Brand | **45%** Would consume the product for sure.

45% of Galp clients would consume Bio LPG.

In another brand:

galp **32%** Would consume the product.

REPSOL **30%** Would consume the product.

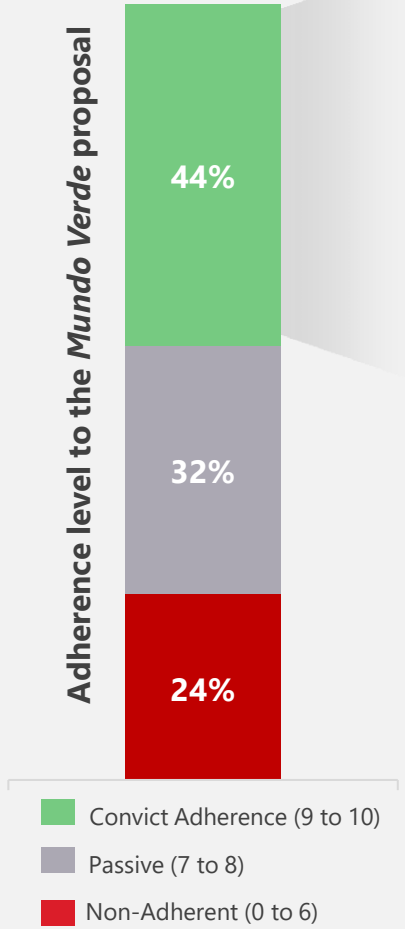
RUBiS GÁS **27%** Would consume the product.

Most Chosen Option to consume

Source: Quantitative Questionnaire Bottled LPG, Qualtrics; [1] SurveyMonkey (with a confidence level of 95%)

44% of the sample has a convict adherence to the service and consumers show a preference for using Green Coins as discounts rather than using them as donations

298 responses
ME: 6%[1]



Adherence profile

The respondents with the most convict adherence have ages between **18 and 30** (**40%**). Secondly, was the respondents aged between **46 and 60** (**34%**).

There is a greater convict adherence for customers of **Galp** (**61%**) and **Rubis Gás** (**15%**).

ME: 9% [1]

Discount Usage Preference

Multiple Choice

Interviewees mention a greater interest in using discounts on the product itself.

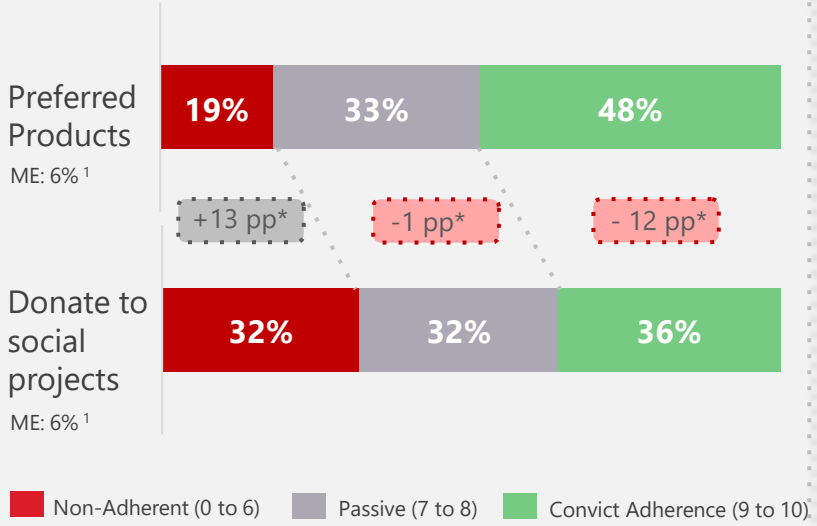
#1 | LPG cylinders (84% of respondents)

#2 | Interior Heaters (24% of respondents)

#3 | Water Heaters (19% of respondents)

ME 6% [1]

Adherence to use discount in:

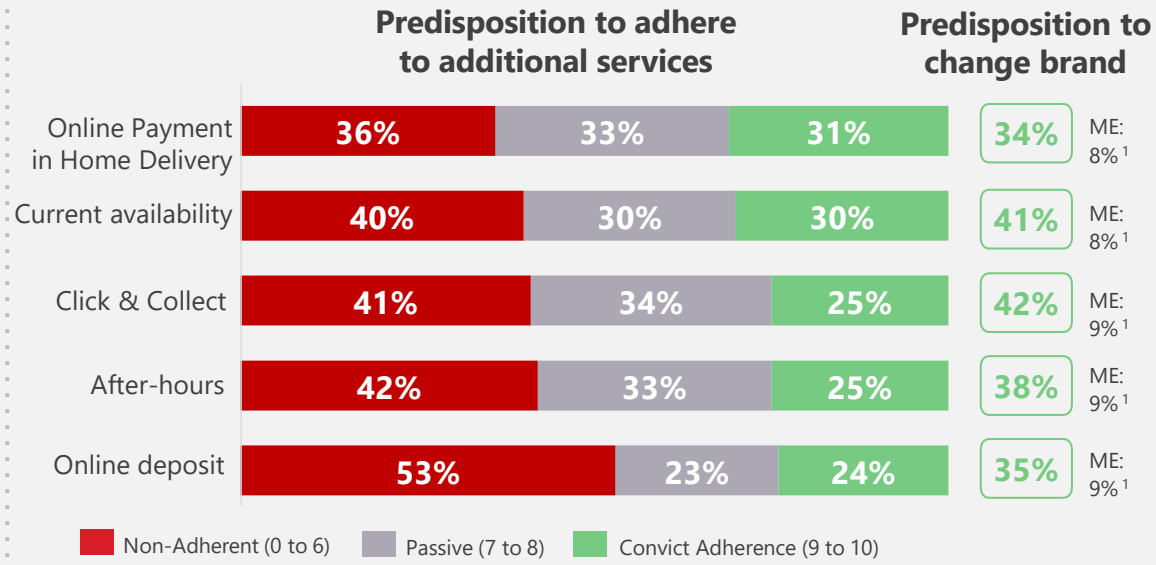


The number of convict adherent respondents is lower in the donations scenario when compared to using the discounts on preferred products and services, revealing **consumers preference for discount-based services**.

*Compared to the adherence to use discounts on preferred product.
Source: Quantitative Questionnaire Bottled LPG, Qualtrics; [1] SurveyMonkey (with a confidence level of 95%)

The adherence to the additional services and the construction store sales proposal reflects the value attributed by the consumer to convenience in the purchasing experience

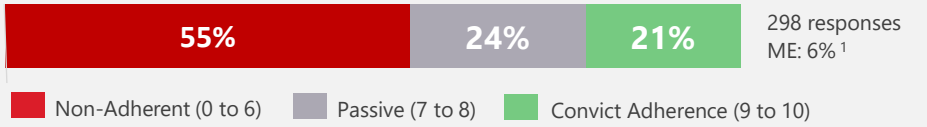
Additional Services



Respondents value the increased **convenience** in the purchasing experience but are **not willing** to switch providers.

Adherence Profile | The most receptive consumers to **all services** have between **46 to 60** years. **Rubis Gás** clients show a higher convict adherence across services.

Adherence level to the construction store cylinder sale proposal



Adherence Profile | There is a greater convict adherence for customers of **Prio** (42%) and **Cepsa** (33%). ME: 12% 1

Customer Satisfaction | 21% of the sample has a convict adherence to the proposal. The high satisfaction with the currently available points of sale, **69%** of the sample is at least satisfied, explains the lower adherence to the proposal. **51%** of consumers recur to service stations and **70%** mention proximity as the main factor to chose a point of sale.

	Not Satisfied	Neutral	Very Satisfied
galp	31%	37%	32%
CEPSA	14%	29%	57%
prio	33%	33%	33%

Table 20: Weight of satisfaction

*(answered previously 8, 9, or 10)

Source: Quantitative Questionnaire Bottled LPG, Qualtrics; 1 SurveyMonkey (with a confidence level of 95%)

The quantitative analysis of the 3 targets gathered insightful information to adapt the value proposition in order to fit consumers' preferences and address their fears

Targets	Key Takeaways	Value proposition features
 **Bottled LPG**	Interviewees value **convenience (55%) and price (26%)** when choosing the provider.	No price increase
	Consumers are more price-driven than sustaianbility-driven. At the **same price**, consumers are willing to switch to Bio LPG **(47%**) and are willing to switch providers **(36%)** to consume the product.	No price increase
	The majority of respondents believes their **own brand's image will improve (82%)** and **Galp's image will improve (75%)** with the introduction of a more sustainable product.	Green Awareness Campaign validated
	Consumers value the convenience enhancement of the additional services but are not willing to switch providers. Respondents have a high adherence to **promotion and discount-based** services **(44% adherence to *Mundo Verde*).**	▪ Drop the additional services proposal ▪ *Mundo Verde* proposal validated
	Consumers find the **proposal of selling LPG cylinders in construction stores irrelevant**.	Drop construction store proposal
 **Auto LPG**	**Low Price (97%)** is the main benefit of Auto LPG. **Price (63%)** and **Proximity (47%)** to the point of sale are the main factors in brand choice. LPG customers are **more price-driven than sustainability-driven**, as illustrated by the **67%** of respondents who **chose the option will the lowest price increase**.	No price Increase
	A large chunk of Auto LPG consumers **(42%)** stated they **would be willing to change brands** if the **price was kept the same** and another brand offered Bio LPG, which was not their regular brand.	No price increase
	A considerable proportion of the Auto LPG users **(45%) are convict adherents to the *Mundo Verde*** System.	*Mundo Verde* proposal validated
 **Bulk B2B LPG**	The majority of companies believes the introduction of sustainable products **improves the brand image (88%)** and consider **important the existence of sustainable products on the energy market.**	Introduce personalized promotion for B2B, presenting the benefits for the company
	44% of the surveyed companies **would be willing to change brand to consume Bio LPG if the price was kept the same**.	Validated price increase due to fiscal incentives
	33% of companies interviewed would be **willing to share their experience with Bio LPG** on a video.	Keep testimonial videos proposal

Table 21: Key Takeaways and Value proposition changes
Source: Hypotheses Testing Analysis

10. Risks, Limitations & Further Research

The reduced time for colleting data for three targets and the difficulty to have access to accurate financial indicators from the Bio LPG market arose as the main challenges

Study Limitations, Risks and Further Research

Sample time-accuracy trade-off	Considering the reduced time frame available to collect both the qualitative and quantitative data for all the three targets in analysis, 16 in-depth interviews for the Bottled LPG, 5 for the Auto LPG and 9 for the Bulk B2B LPG, and 298 survey valid answers for the Bottled LPG, 172 for the Auto LPG and 18 for the Bulk B2B LPG were a remarkable achievement. A larger time frame would have allowed for a broader collection of data and, therefore, a better representation of the LPG clients, with more accurate conclusions and lower margins of error.
Covid-19	Covid-19 had a huge influence on all aspects of the society, but it was particularly relevant in the economic activities. As 2020 was largely influenced by the pandemic, LPG consumption and other economic and financial indicators were affected. Therefore, most historic data used in the financial analysis was from 2019, and not 2020.
Recent Product	Bio LPG is a recent product and, therefore, its production is still not fully studied, and detailed costs and inputs are not concretely defined, namely the importation and trading costs. Thus, the financial analysis results are largely affected by the estimated values for these costs.
Legal Incentives	The legal component in the biofuels markets is of extreme complexity and volatility. The fiscal incentives from the government to the companies for the consumption of this sources of energy will affect immensely the price they are willing to pay and, thus, the profitability of the projects studied. Also, the margin of Midstream to produce and commercialize the product is largely affected by legal incentives and the international carbon credits market, making it difficult to have accurate values.

Table 28: Study Limitations, Risks and Further Research

A work Project presented as part of the requirements for the Award of a Master's degree in Management / Economics / Finance

from the Nova School of Business and Economics

Consulting Lab for Galp Energia –
Business Model Bio LPG and LPG as a Support Energy: Bio LPG as a renewable energy source

NOVA SCHOOL OF BUSINESS & ECONOMICS

Pedro Mota Gomes Horta | 26207

A Consulting Lab carried out under the supervision of:

Professor Constança Monteiro Casquinho

21-05-2021

With the analysis of both questionnaires, Price Seekers and Convenience Seekers were the key personas detected in Auto LPG target

KEY PERSONAS

PRICE SEEKERS

QL – 3 of 5 interviewees | QT - 64% of the sample

- **Reduced** or **inexistent willingness to pay more**.
- **Current Price** is the main factor in their brand's choice – driven from the economic value of the product.
- If another brand offered Bio LPG at the **same price** as conventional LPG, **they would consider changing**.

CONVENIENCE SEEKERS

QL – 1 of 5 interviewees | QT - 16% of the sample

- **Price is not the main decision factor**, the proximity is more relevant.
- Driven by **low effort and simplicity** of the purchase.
- Low involvement with the brand – does not build a relationship.

PROMOTION SEEKER

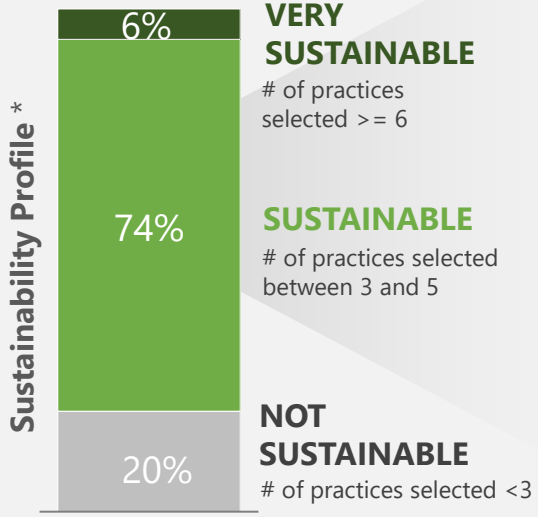
QL – 1 of 5 interviewees | QT - 0% of the sample

- **Full knowledge of the possible promotions** for each brand.
- **Searching for the best deals** by the amount of money the customer can save.

Represenative Personas validated in the Quantitative Analysis

Source: Qualitative Analysis and Quantitative Questionnaire Auto LPG, Qualtrics.
Note: Questionnaires used for each analysis in the Appendix 23 and the Qualitative Analysis in the Appendix 24. Further Research about the Key Personas Validation in the Appendix 28.

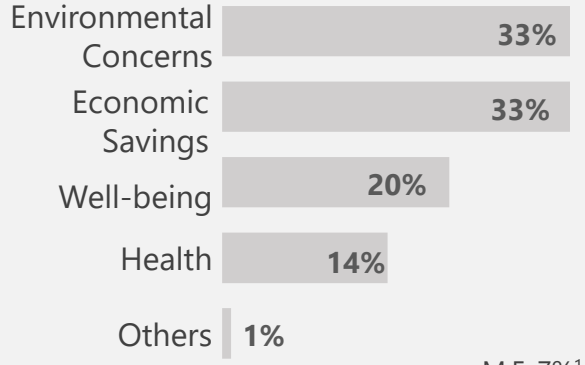
80% of the sample is considered to be sustainable, but the Price was the most mentioned factor in brand choice, as well the main decision driver



172 responses – M.E: 7%[1]

Reasons to adopt sustainable behaviours

Multiple Choice



M.E: 7%[1]

- The majority of the respondents show **sustainable practices** (**80%**), mainly because of **environmental concerns** (**33%**) and **economic savings** (**33%**).
- Besides the Sustainability profile, the majority of the sample (**85%**) believe that brand's image will **improve with a introduction of sustainable products**.

M.E: 7%[1]

Auto LPG Consumer Profile

MAIN DECISION DRIVERS

Multiple Choice

97%	**Price**
63%	Sustainability
33%	Engine Conservation

M.E: 7%[1]

MAIN FACTORS IN BRAND CHOICE

Multiple Choice

63%	**Price**
47%	Proximity
21%	Brand Trust

M.E: 7%[1]

Main Factors for Galp's customers:

galp

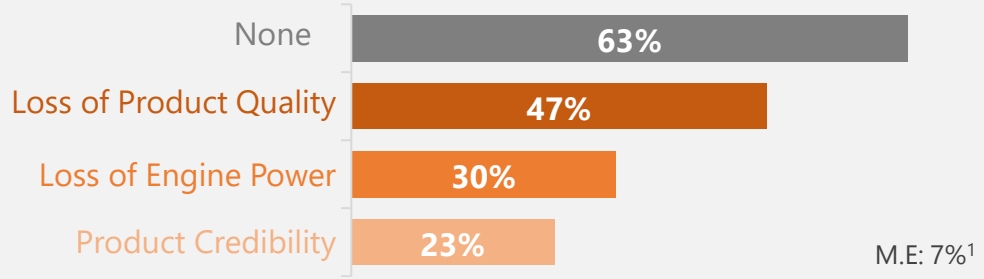
Proximity	**Brand Trust**	**Quality & Price**
48%	36%	29%

M.E: 15%[1]

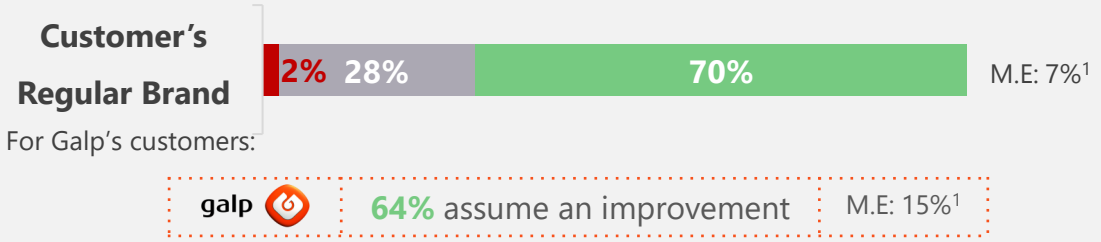
* Sustainable Profile based on how many selected options in the Q4 – detailed information is available in the questionnaires in the Appendixes.
Source: Quantitative Questionnaire Auto LPG, Qualtrics; [1] SurveyMonkey (with a confidence level of 95%)
Note: Further analysis about the consumption of Auto LPG and overall satisfaction about the availability in the Appendix 25.

Most customers had no prior knowledge of the product, expressed concerns to use it, and consider that it improves the company's brand image

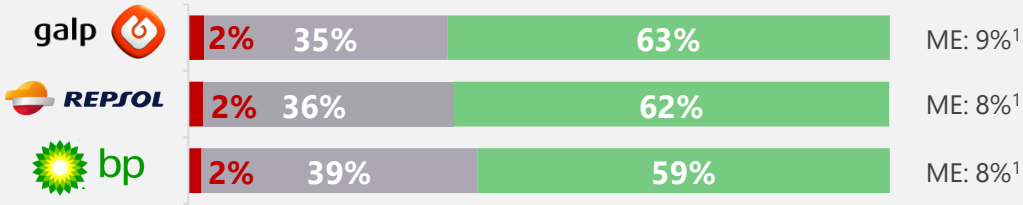
Biggest concerns regarding the consumption of Bio LPG



Customer's perception on the brand image of the commercialization of Auto Bio LPG

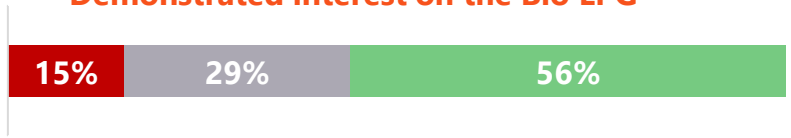


On other brands' image:

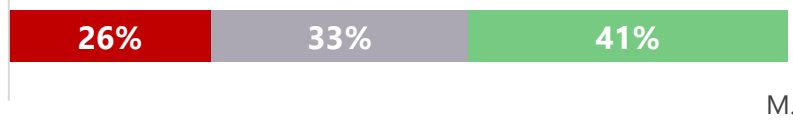


WITHOUT PRICE KNOWLEDGE

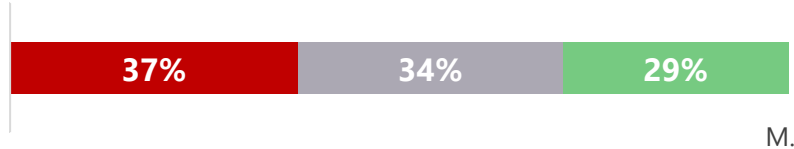
Demonstrated interest on the Bio LPG



Willingness to buy Bio LPG on the current brand



Willingness to change brand to buy Bio LPG



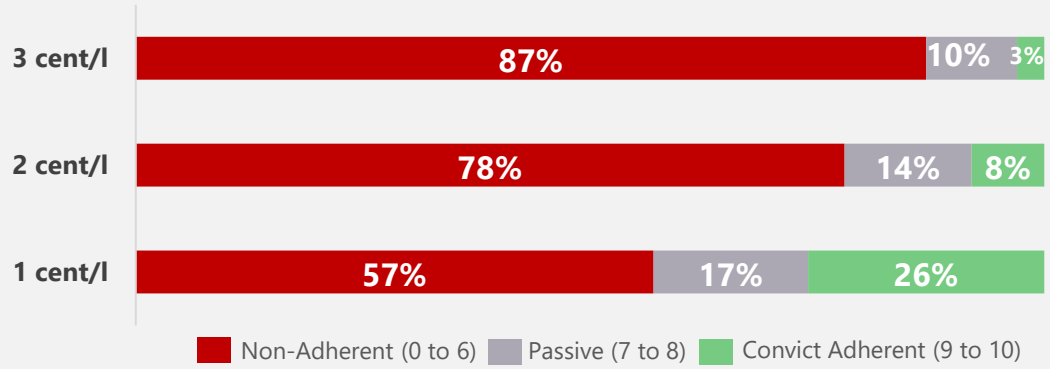
Non-Adherent (0 to 6) Passive (7 to 8) Convict Adherent (9 to 10)

- Almost half of the sample (**41%**) is **willing to consume Bio LPG in their current brand** of Auto LPG, showing less interest in changing the brand.

Source: Quantitative Questionnaire Auto LPG, Qualtrics; [1] SurveyMonkey (with a confidence level of 95%)

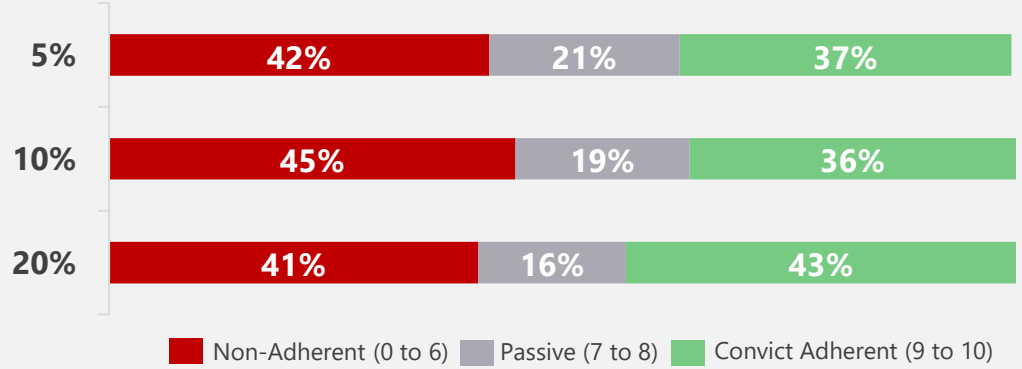
Auto LPG consumers prioritize price over the incorporation of Bio LPG on the product, which means they are more price-driven than sustainability-driven

1st Scenario: Price Increase



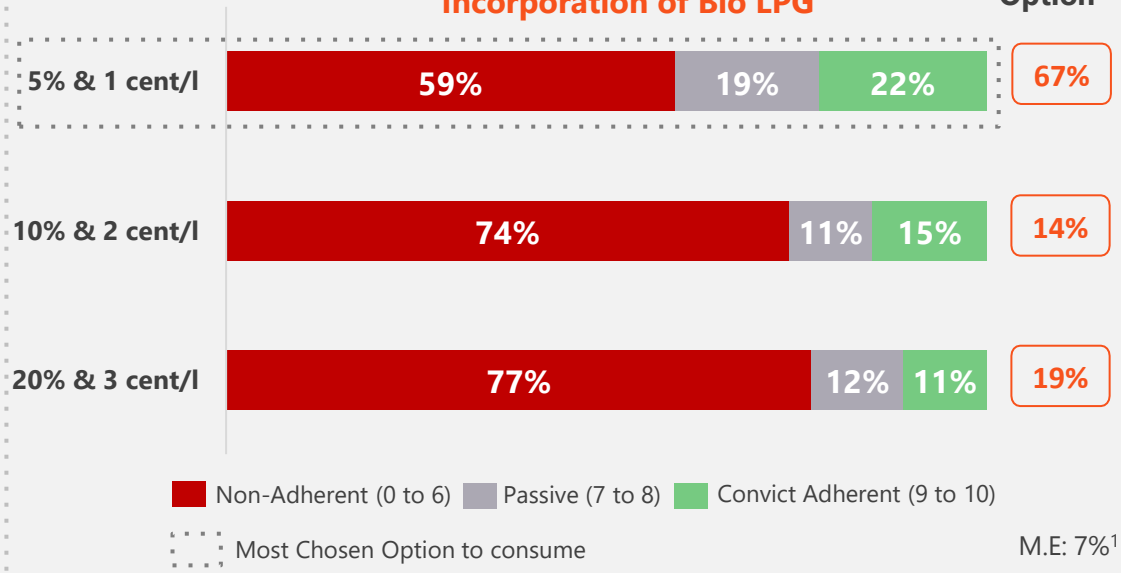
M.E: 7%[1]

2nd Scenario: Incorporation of Bio LPG Options



M.E: 7%[1]

Preferred combination of Price Increase & Incorporation of Bio LPG



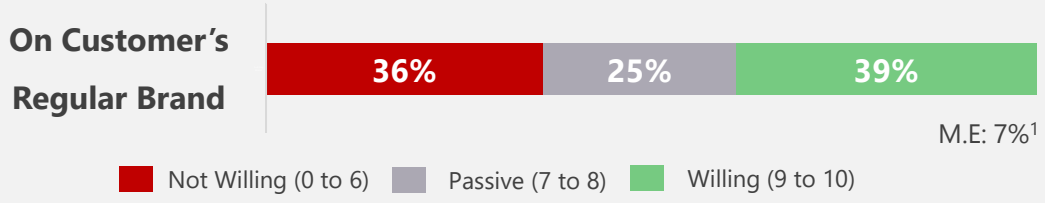
M.E: 7%[1]

- Independently of the adherence in each scenario, the sample demonstrated to be **high-price sensitive**, since the most chosen option to consume (**67%**) was the product with **5% of Bio LPG and 1 cent/l increase**.

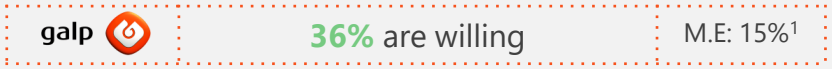
Source: Quantitative Questionnaire Auto LPG, Qualtrics; [1] SurveyMonkey (with a confidence level of 95%)

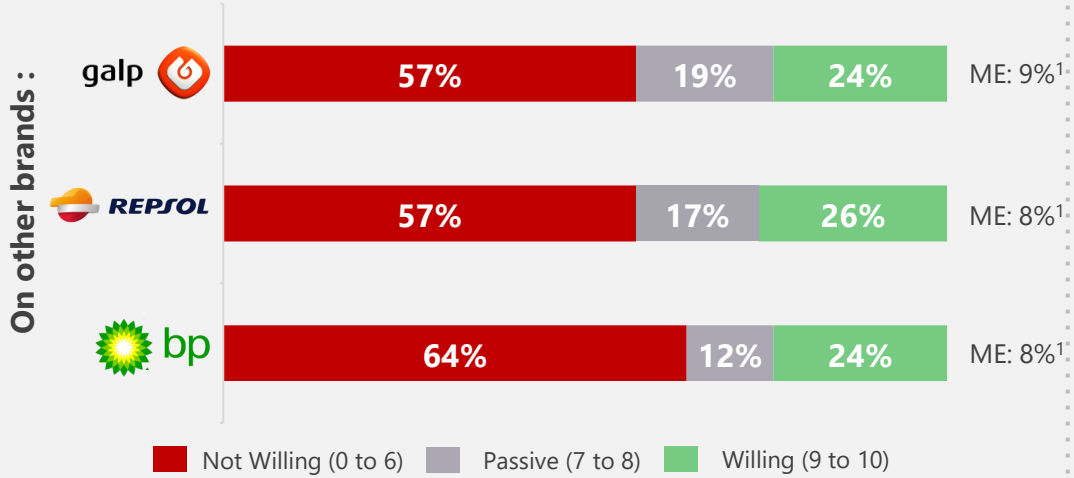
39% of the customers are willing to acquire Bio LPG at their regular brand, but 42% would change the brand to consume Bio LPG if the price was kept unchanged

Willingness to consume the Auto Bio LPG chosen option:



For Galp's customers:

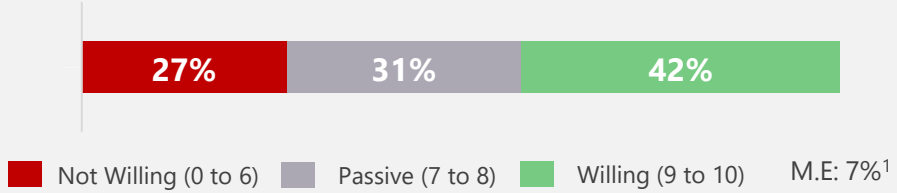




Willingness to change brand to consume Bio LPG

Assuming the following scenario:

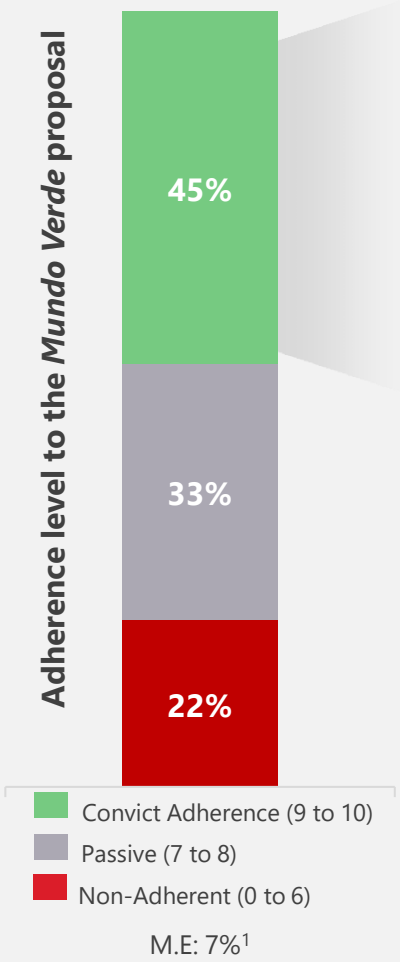
- Bio LPG **maintains the same price** as conventional LPG;
- Customer's **current brand does not offer Bio LPG**.



- A **considerable percentage of the sample** (**24%**), which are **not Galp customers**, would be **willing to change to Galp to consume Bio LPG.**
- A **large chunk of Auto LPG consumers** (**42%**) stated they would be **willing to change brands** if the **price was kept the same** to consume Bio LPG.

Source: Quantitative Questionnaire Auto LPG, Qualtrics; [1] SurveyMonkey (with a confidence level of 95%)

Consumers show a greater interest in using the *Mundo Verde* system mainly due to the possibility of using discounts on their preferred products



Convict Adherence profile

- **52% of the Convict Adherents** have ages between **31 and 45**, followed by the respondents aged between **46 and 60** (**24%**).
- **23% of the Convict Adherents** are represented by **Galp's customers** and **21%** are **Auchan's customers.**

M.E: 11%1

Main Discount Usage Preferences

Multiple Choice

#1 | Auto LPG (98%)

#2 | LPG cylinders (20%)

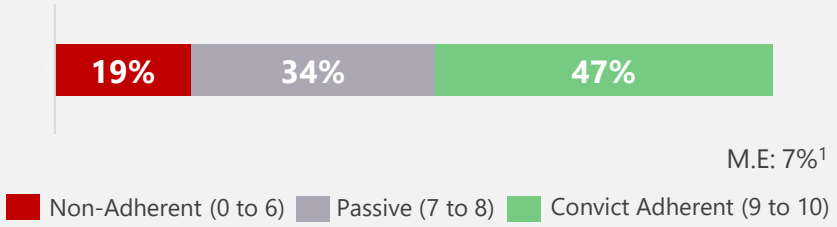
#3 | Technical Assistance (15%)

#4 | Stove; Wate Heater; Boliers (each 6%)

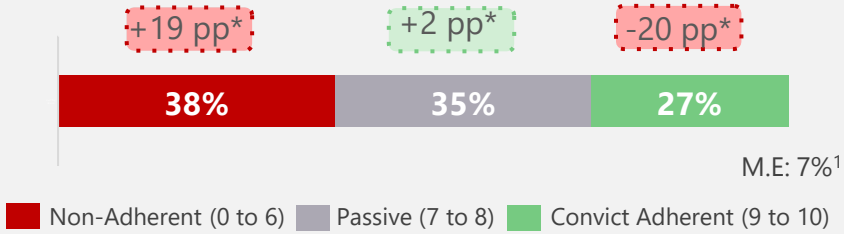
#5 | Grills (4%)

M.E: 7%1

Adherence to use discount in preferred products



Adherence to donate to a social project



- Almost the majority of the Auto LPG users (**45%**) are **convict adherents to the *Mundo Verde* system.**
- The respondents show a **greater willingness to use the discounts** (**47%**) than to donate to a social project (**27%**).

*Compared to the adherence to use discounts on preferred product.
Source: Quantitative Questionnaire Auto LPG, Qualtrics; 1 SurveyMonkey (with a confidence level of 95%)

Based on the analysis, Brand Enhancement Seekers, Price seekers and Trust Seekers were the 3 personas identified in the sample

KEY PERSONAS

PRICE SEEKERS

QL – **6 of 9 interviewees** | QT - **44% of the sample**

- **Reduced willingness to pay more.** Higher adherence to a lower price increase option.
- Willingness to **change supplier to consume Bio LPG, if there existed equal price conditions.**

BRAND ENHANCEMENT SEEKERS

QL – **2 of 9 interviewees** | QT - **28% of the sample**

- Considers the **usage of sustainable products an investment on the brand image.**
- Values the **quantification** of their impact and expects a **certification of the sustainable consumption.**

TRUST SEEKERS

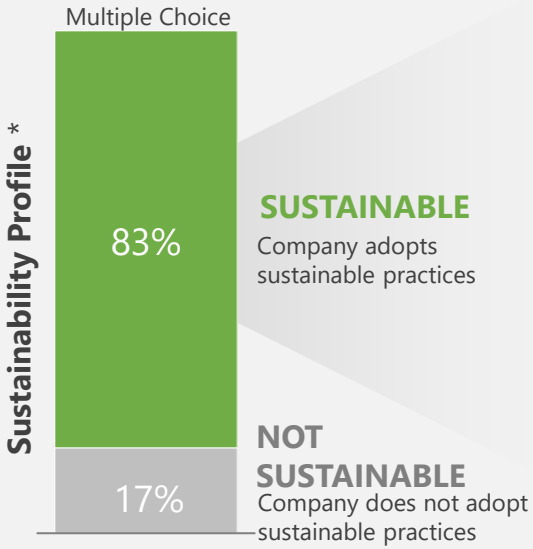
QL – **1 of 9 interviewees** | QT - **11% of the sample**

- Driven by **brand trust and product quality**.
- Unlikely **to change supplier frequently**.
- **High involvement with the provider**.
- Desire to be **well-informed about the characteristics of the products.**

Represenative Personas validated in the Quantitative Analysis

Source: Qualitative Analysis and Quantitative Questionnaire Bottled LPG, Qualtrics
Note: Questionnaires used for each analysis in the Appendix 26 and the Qualitative Analysis in the Appendix 27. Further Research about the Key Personas Validation in the Appendix 28.

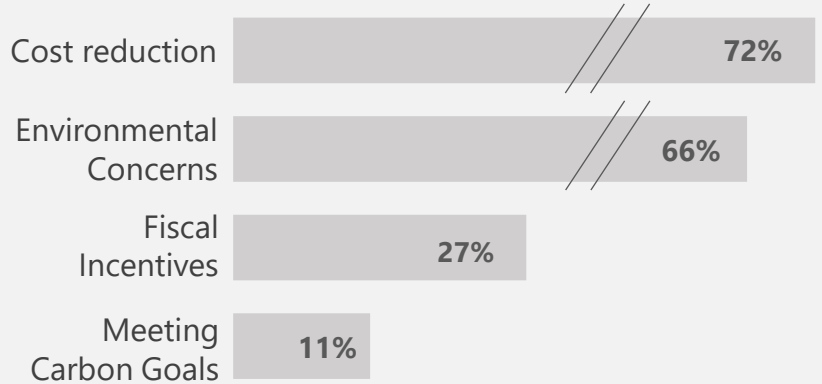
72% of Bulk B2B clients highlighted cost reduction as the main reason to adopt sustainable behaviours and 67% chose price as the main factor in brand choice



18 responses – M.E.: 23%[1]

Reasons to adopt sustainable behaviours

Multiple Choice



M.E: 23%[1]

Bulk B2B Consumer Profile

MAIN DECISION DRIVERS

Multiple Choice

56%	**Only viable alternative**
28%	Price
17%	Calorific Power

M.E: 23%[1]

MAIN FACTORS IN BRAND CHOICE

Multiple Choice

67%	**Price**
28%	Brand Trust
22%	Product Quality

M.E: 23%[1]

- The majority of the surveyed companies show **sustainable practices** (**83%**), mainly due to the associated **cost reduction** (**72%**) and **environmental concerns** (**33%**).
- **55%** of the surveyed companies indicated to be concerned or very concerned with the **environmental impact of their gas consumption.** M.E: 23%[1]
- **67%** of the companies consider that **the introduction of Bio LPG would improve Galp's image.** M.E: 23%[1]

* Sustainable Profile based on sustainable questions - detailed information is available in the questionnaires in the Appendixes.
Source: Quantitative Questionnaire Bulk B2B LPG, Qualtrics; [1] SurveyMonkey (with a confidence level of 95%)

88% of the surveyed companies would not be willing to pay more to acquire Bio LPG, while 44% would be willing to change brand if the price was the same

WITHOUT PRICE KNOWLEDGE:

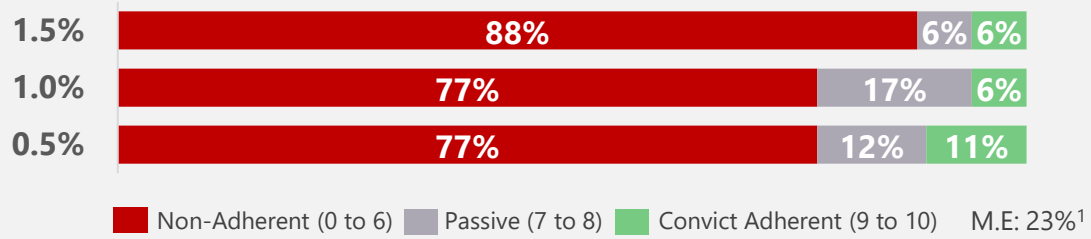
28% **Demonstrated to be very interested in the Bio LPG.**

39% Claimed to be **willing to buy Bio LPG provided by Galp**.

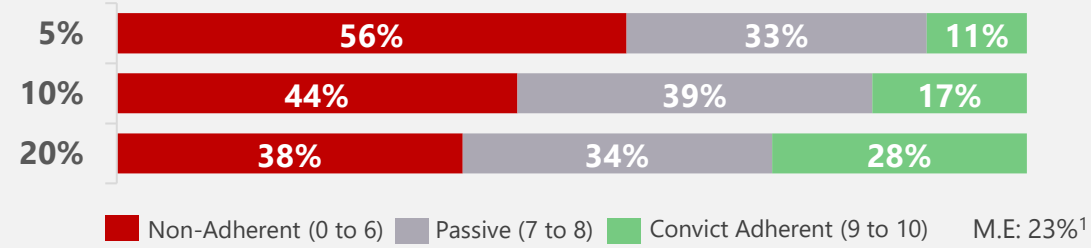
33% **Would be willing to change brand to consume Bio LPG.**

M.E: 23%[1]

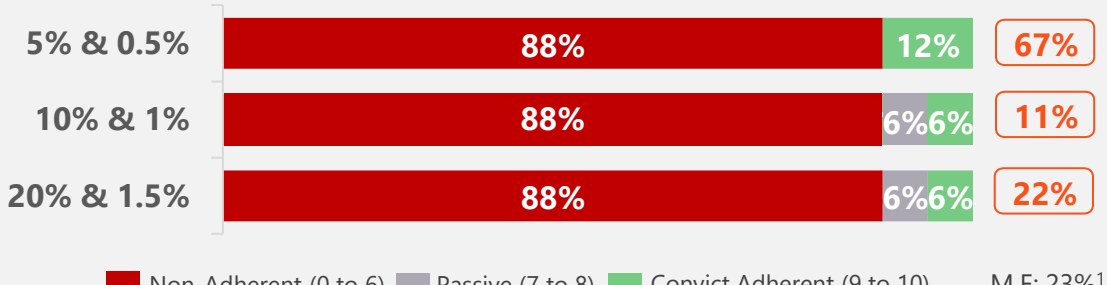
1st Scenario: Price Increase



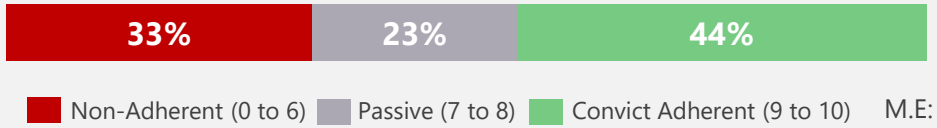
2nd Scenario: Incorporation of Bio LPG Options



Preferred combination of Price Increase & Incorporation of Bio LPG



Predisposition to change brand to consume Bio LPG at the same price



WITH PRICE KNOWLEDGE:

88% **Would not be willing to pay more to acquire Bio LPG.**

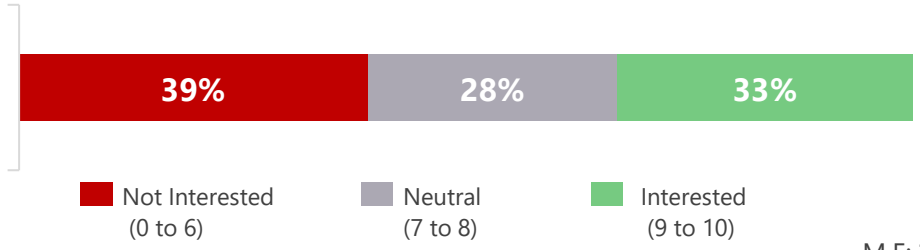
44% Would be **willing to change brand, if the price was the same as** the one already paid for the conventional LPG.

Source: Quantitative Questionnaire Bulk B2B LPG, Qualtrics; [1] SurveyMonkey (with a confidence level of 95%)

33% of the surveyed companies would be willing to share their experience with Bio LPG on a video, and receive a certificate proving the impact of their LPG consumption

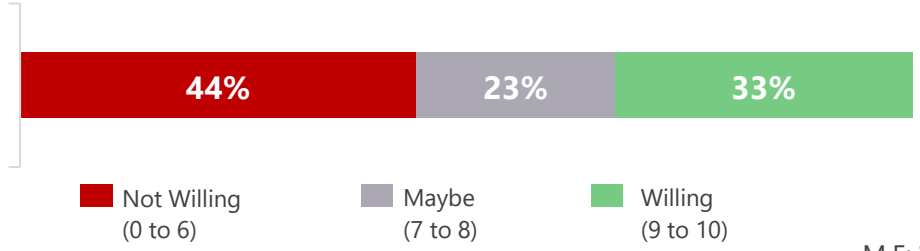
ADDITIONAL SERVICES

Importance of quantifying the environmental impact generated by energy consumption



M.E: 23%[1]

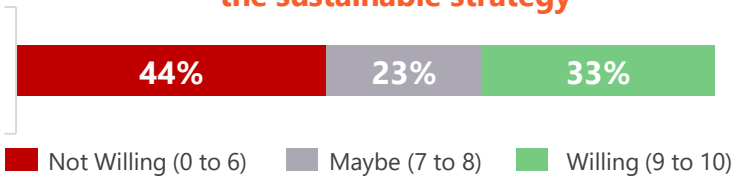
Willingness to receive a certificate that proves the environmental impact from the consumption



M.E: 23%[1]

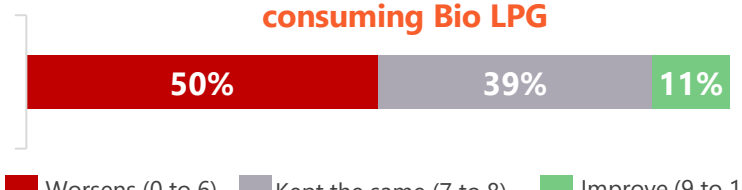
EXPERIENCE SHARING IMPACT

Willingness to share their experience with Bio LPG on a video as part of the sustainable strategy



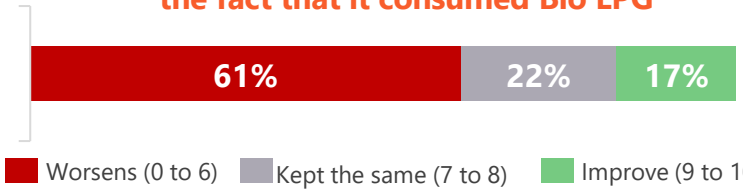
M.E: 23%[1]

Perception of their clients about the company given the fact it is consuming Bio LPG



M.E: 23%[1]

Willingness of the consumers to buy products of the company given the fact that it consumed Bio LPG



M.E: 23%[1]

Source: Quantitative Questionnaire Bulk B2B LPG, Qualtrics; [1] SurveyMonkey (with a confidence level of 95%)

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12. Appendix

Appendix 1: Project Timeline

Phase 0: Kick-Off

- Preparation of the Kick-Off document

Phase 2: Analysis

- Qualitative In-Depth Interviews
- Quantitative Questionnaires
- Sharpening of the Value Proposition accordingly

Phase 4: Final Academic Presentation

- Final academic presentation with the feedback provided on the third steering

Kick-Off Presentation
February 5th

1st Steering
March 1st

2nd Steering
April 8th

3rd Steering
May 6th

Final Academic Presentation
June 7th

Phase 1: Diagnostic

- Production Processes
- Potential Suppliers
- Benchmark International, Non-energy and National markets
- Value Proposition

Phase 3: Recommendations

- Analysis of the carbon credit market and existing fiscal incentives
- Financial analysis
- Launching and implementation plan for the new product
- Analysis of different scenarios

Appendix 2: Sample Design

TARGETS

B2C

Bottled LPG

1 **QUALI**
16 interviews

2 **QUANTI**
298 valid answers

2 to 3 million customers

Auto LPG

1 **QUALI**
5 interviews

2 **QUANTI**
172 valid answers

50k customers

B2B

Bulk B2B LPG

1 **QUALI**
9 interviews

2 **QUANTI**
18 valid answers

9k clients

1 QUALI

From March 10th to 20hd, 2021

- **Individual in-depth interviews** to the clients of the 3 targets.
- Understand **how the clients react** to the introduction of a more sustainable LPG.
- **Test the predisposition** of the clients to pay a premium for the product.
- **Assess the customers adherence** to the three proposed Bio LPG incorporations.
- **Incorporate the feedback** received into the value proposition and test it on the quantitative survey.

2 QUANTI

From March 19th to 27th, 2021

- Construction of the quantitative questionnaires based on the qualitative results and findings.
- Perform quantitative **questionnaires** to the three targets*.
- Evaluate the customers sustainability profile.
- **Determination of the preferred Bio LPG composition** and the corresponding price.
- **Validate the quantitative results** with the previous conclusions.
- Receptivity integrated analysis (Quali-Quanti) to the **value proposition**.

*The questionnaires were distributed using the questionnaire platform - Qualtrics online, with access provided by Nova School of Business and Economics.

Appendix 3: Sample Overview of the Qualitative – Bottled LPG

INTERVIEWEES

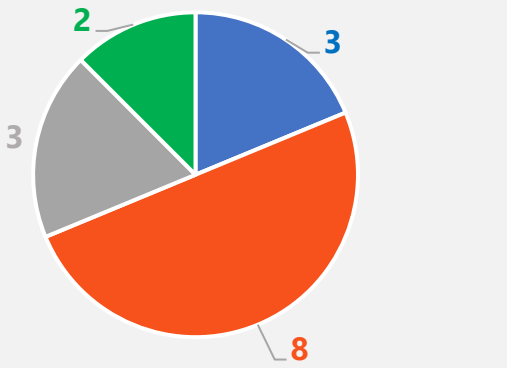
16 In-Depth Interviews

GENDER

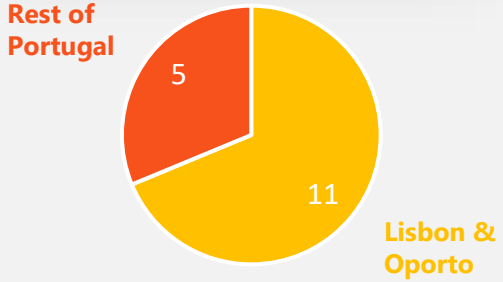
7 (44%) FEMALE

9 (56%) MALE

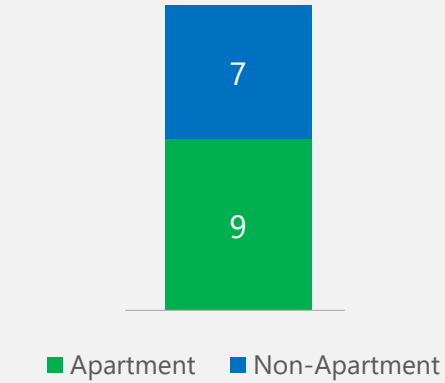
AGE



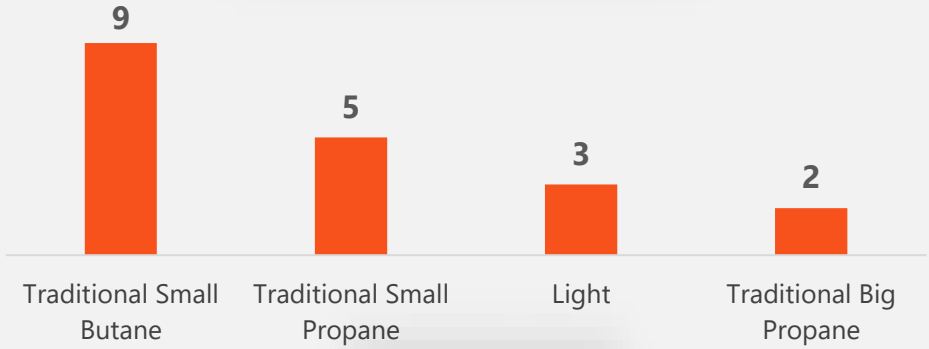
LOCATION



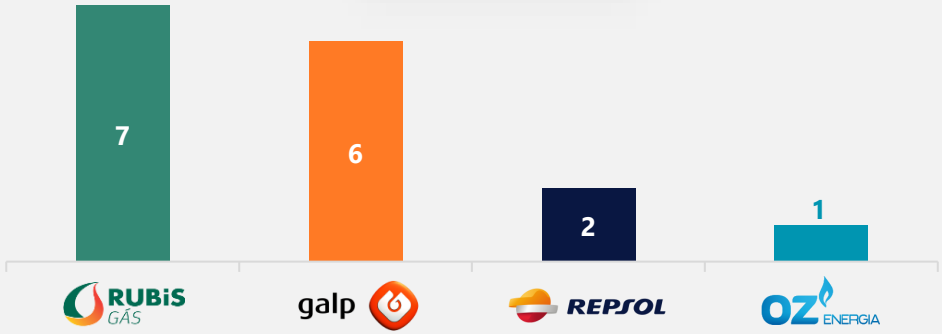
TYPE OF RESIDENCE



TYPE OF CYLINDER*



BRAND



Source: Qualitative Interviews.
Note: Qualitative interviews were conducted per phone call or in person following the guide available in the Annex 1.A.
*The number of cylinders bought is bigger than the number of respondents because each respondent may purchase more than one type of cylinder.

Appendix 3: Sample Overview of the Qualitative – Auto LPG

INTERVIEWEES

5 In-Depth Interviews

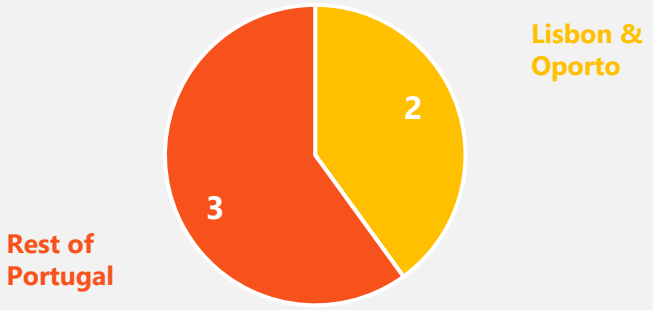
GENDER

1 (20%) FEMALE

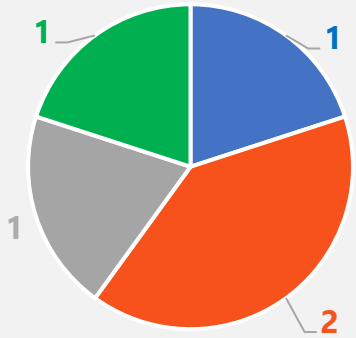
4 (80%) MALE

- Lisbon: x1
- Oporto : x1
- Santarém : x2
- Setúbal : x1

LOCATION



AGE



BRAND[1]

*some interviewees chose more than one brand.

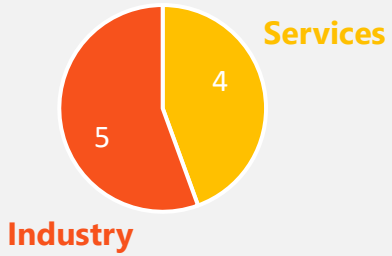
Note: Qualitative interviews were conducted per phone call following the guide available in the Annex II & A.
Source: Qualitative Interviews

Appendix 3 & 4: Sample Overview of the Qualitative and Quantitative – Bulk B2B LPG

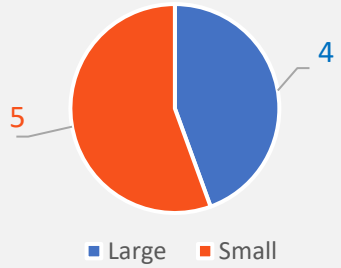
QUALITATIVE

9 In-Depth Interviews

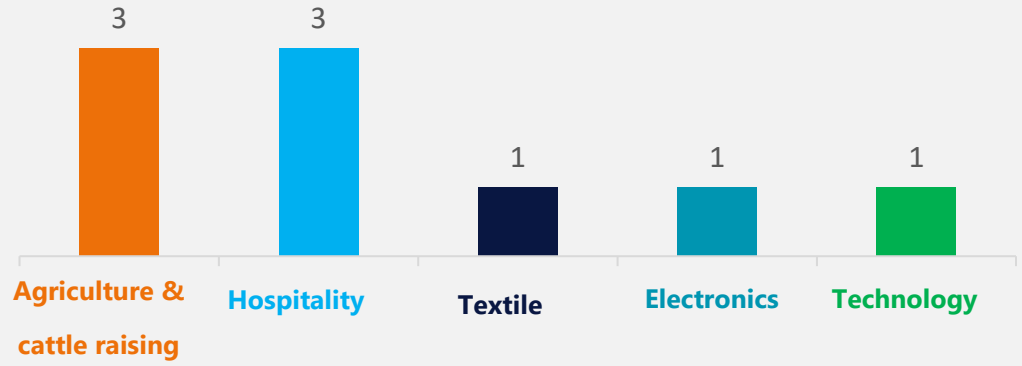
- **COMPANY TYPE**



- **COMPANY DIMENSION**



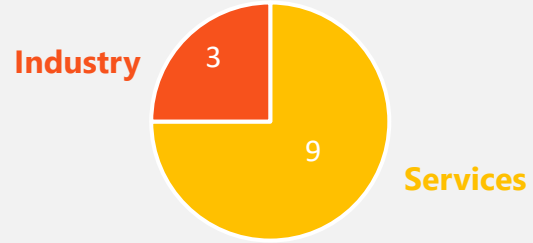
- **COMPANY SECTOR**



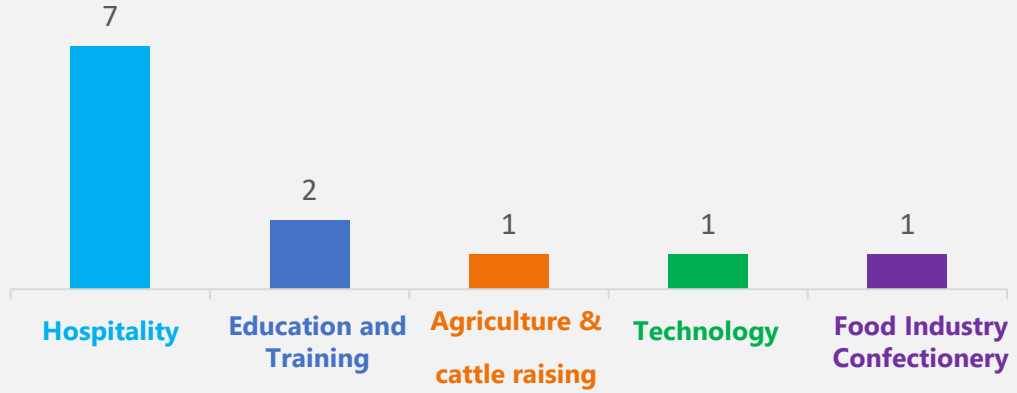
QUANTITATIVE

18 Valid Answers

- **COMPANY TYPE***



- **COMPANY SECTOR***



Source: Qualitative Interviews & Quantitative Questionnaire B2B Bulk LPG, Qualtrics.

Note: Qualitative interviews were conducted per phone call or online meeting following the guide. Quantitative were conducted in the online platform Qualtrics following also the guide; *Some of the companies did not fill the name in the online survey.

Appendix 4: Sample Overview of the Quantitative – Bottled LPG

REACH

298 Valid Answers

764 people reached

Margin of Error: 6%

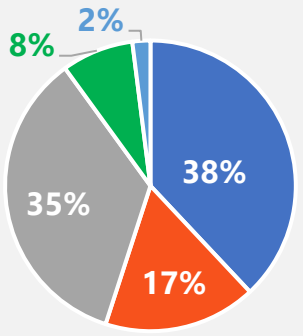
GENDER

59% FEMALE

39% MALE

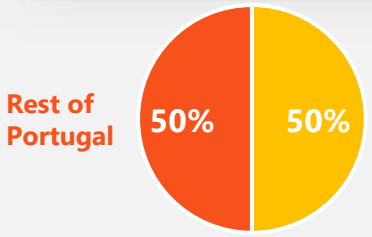
2% prefer not to say

AGE

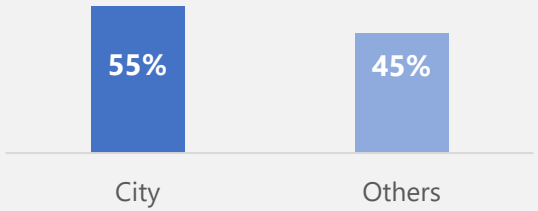


18-30 31-45 46-60 61-75 >75

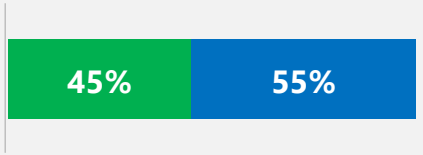
LOCATION



TYPE OF LOCATION



TYPE OF RESIDENCE



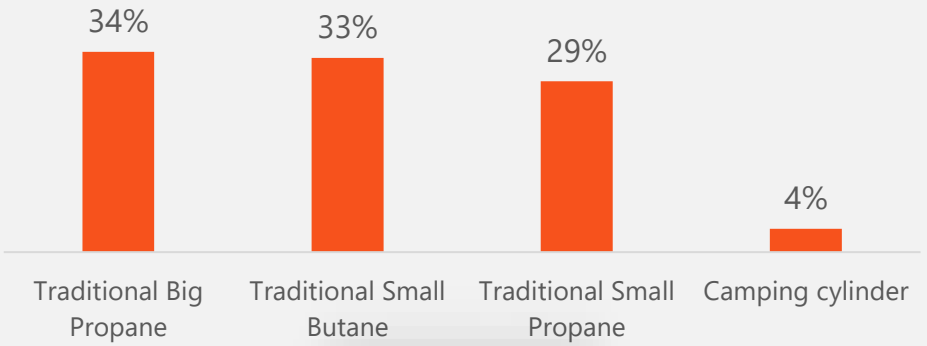
Apartment Non-Apartment

DECISOR OR INFLUENCER?

72% DECISOR

28% INFLUENCER

TYPE OF CYLINDER*



BRAND

Source: Qualitative Interviews. The questionnaire was distributed using the platform Qualtrics online, access provided by Nova School of Business and Economics.

*Respondents could select more than one cylinder type

Appendix 4: Sample Overview of the Quantitative – Auto LPG

REACH

172 Valid Answers

246 people reached

Margin of error: 7%

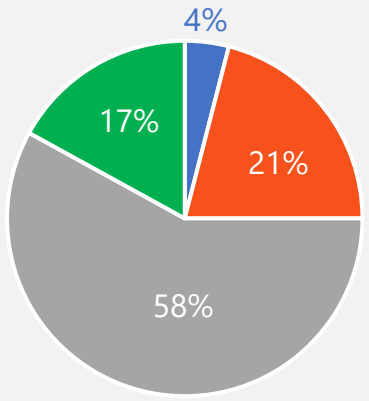
GENDER

12% FEMALE

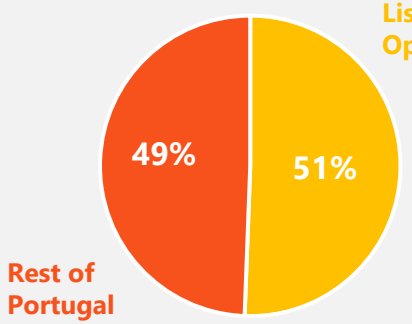
87% MALE

1% prefer not to say

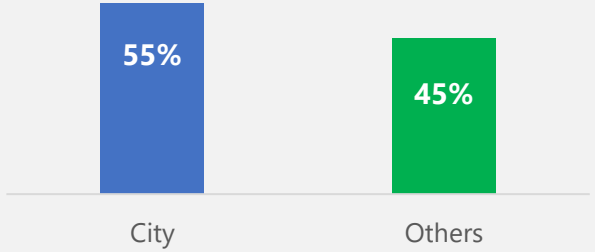
AGE



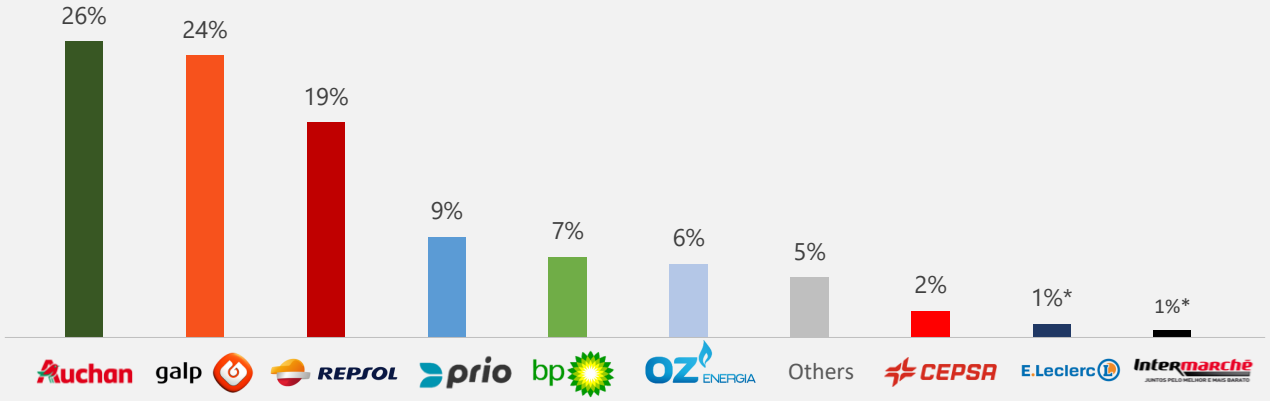
LOCATION



TYPE OF LOCATION



BRANDS [1]



Note: Multiple Choice Question - some respondents chose more than one brand.

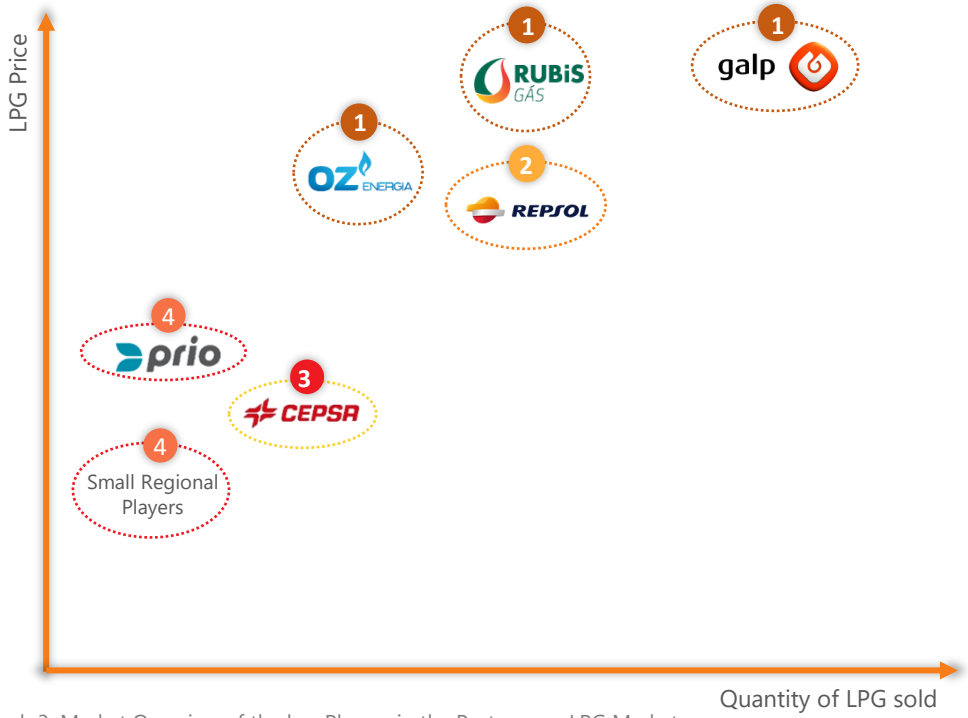
Note: The questionnaire was distributed using the platform Qualtrics online, access provided by the Nova School of Business and Economics.

Source: Quantitative Questionnaire Auto LPG, Qualtrics

Appendix 5: Competitive Environment Analysis - Galp's Competitors Positioning

Galp's current competitors on the Portuguese LPG market can be classified on the following graph, according to the strength of their market presence, to the average price charged, and to their overall market strategy.

Market Overview



Graph 3: Market Overview of the key Players in the Portuguese LPG Market.

Competitors' Group Classification

1
- Large networks of points of sale.
- Similar pricing strategy.

2
- Strong presence on the Portuguese LPG market.
- Capacity to produce large quantities of Bio LPG.
- Offer of a wide range of cards and discounts.

3
- Strong presence on the Spanish fuel market.
- Committed to the production of Bio LPG.
- Low-price strategy.

4
- Low-price strategy.
- Companies with no international presence.

Appendix 6: National Benchmark – Rubis Gas & BP

Rubis Energia Portugal belongs to the French group Rubis, founded in 1990, which currently operates in 41 countries[4].

Rubis considers environmental protection a priority and has the commitment to reduce CO_2 emissions[4].

Existence of **approximately 10k points of sale** in Portugal[5].

Approximately 3.5k employees[5].

Rubis does not possess any gas stations in Portugal[5], and approximately 47% of LPG cylinder sales in Portugal were from gas stations[6].

PRODUCTS [1]

G26 *Butano* Light (12kg)

G24 *Butano* (13kg)

G110 *Butano* (55kg)

G26 *Propano* (11kg)

G26 *Propano Carburação* (11kg)

G110 *Propano* (45kg)

Rubis Gás supplies bulk LPG for domestic and corporate usage., as well as Auto LPG.

PARTICIPATIONS [1]

- CLC – *Companhia Logística de Combustíveis*, S.A. (*Aveiras*)[1] – *5%* [7]
- Pergás – *Armazenagem de Gás*, A.C.E. (*Perafita*) – 30,75% [7]
- Sigás – *Ar mazenagem de Gás*, A.C.E. (*Sines*) – 35% [7]

The UK based company **is one of the world's largest players in the oil and gas industry**. BP explores, refines, distributes and sells different fuels[2].

HVO

The company is changing its business model to better support the transition to a greener product portfolio, by further developing bioenergy sources for aviation, marine and transportation.[2]

Currently, **the company produces HVO in its refinery in Castellon**. The annual capacity is 80k tonnes of HVO[5]. **Hence, the Bio LPG production through co-processing is approximately 4k tonnes*.**

PORTUGAL

In 2020, BP was the second largest gas station network in Portugal, with 500 posts[3].

In Portugal, the supply of LPG at BP's gas stations is currently done by Rubis Gás[2].

*Value computed by applying the 5% rate of Bio LPG to the total quantity of HVO produced.

Sources: [1] Rubis Gás, [2] BP, [3] Jornal Económico, [4] Rubis, [5] "*GPL Garrafas e Canalizado*"- Direção GPL IB, [6] "Tracking *GPL Garrafas* 2019", [7] ERSE

Appendix 6: National Benchmark – OZ Energia

Fully owned by Manuel Champalimaud SGPS S.A., a Portuguese company[1].

Existence of approximately **5k points of sale and 120 stores** [1].

Possession of 13 Gas Stations in Portugal[1]:

- 12 stations with LPG cylinders;
- 7 stations with Auto LPG;
- 7 stations available 24h.

INITIATIVES

The company has the ***"Adaptar para Integrar"* Program,** to promote sport practice among disabled people, and ***"Comunidade OZ"*** to support events of local communities[1].

PRODUCTS [1]

OZ supplies bulk LPG for domestic and industrial usage.

TRAFARIA'S TERMINAL

OZ's private terminal to import and store LPG.

- Capacity to fill 6k propane cylinders of 11kg / 6k butane cylinders of 13kg; and 1.5k propane 45kg cylinders daily.
- Supplies 24 trucks daily.
- Receives LPG from 40 ships per year.
- LPG storage capacity of 62k m^3 and 1150 m^3 of bottled products.

SERVICE

MultiSeguro OZ Energia [1]
Free insurance service offered in a partnership with Fidelidade, for accidents related with the acquired gas cylinders. The insurance covers expenses up to 30k € per accident, and up to a maximum total coverage of 3M € per year, for all clients.

Simulator Auto LPG [1]
Simulator which allows the customer to compute the annual savings by using Auto LPG.

Emergency Service 24/7, for bulk LPG customers [1].

CUSTOMER CARDS

Cartão Desconto [1]
Allows the client to have direct discounts at the moment of the purchase but cannot be used as a mean of payment.

Cartão OZ Energia Frota [1]
Gives the client a credit to purchase fuels, provides the driver a certificate proving the acquisition of the product or service, and sends the company a list, which simplifies its fleet management.

Sources: [1]OZ Energia

Appendix 6: National Benchmark – Cepsa

The Spanish company is present in the Portuguese market, using a **low-price strategy to increase market share**. The company its **still looking to initiate its filling activities** in Portuguese territory.

Existence of 265 Gas Stations in Portugal[2].

Possession of 210 stores (Depaso, Depaso Café and Mini Market) **in Portugal.**

One of Cepsa's main strengths is the **communication and design of the light cylinders**, part of Cepsa's commercial aggressiveness.

BIO LPG

Cepsa has produced **HVO since 2011** [1]**.** The company owns two refineries, La Rábida and Gibraltar-San Roque, capable of producing 180k tonnes of HVO, and **around 9k tonnes of Bio LPG, through co-processing***.

PRODUCTS

Light cylinder: 11 kg Propane

Steel cylinder: 35 kg Propane

Light cylinder: 12,5 kg Butane

Steel cylinder: 45 kg Propane

Cepsa supplies bulk and bottled LPG, for domestic and industrial usage, and Auto LPG.

ADDITIONAL SERVICES

- **Personalized technical and commercial support**
- **Home Delivery**
- **Instalation & Maintenance through distributors**
- **Telephone assistance 24 hours** to order

DISCOUNT CARD

Cepsa discount card *Porque eu Volto* is available in **4 quick steps**:

1. **Ask for your card**
   Simple… The client enrolls in the program and can receive a real card or transfer it to the phone, in order to be always available.
2. **Accumulate 5 points per litre**
   Easy… Filing up the tank of the car gives points to the client. The client can access those points on his/her private area.
3. **Save an additional 40%**
   Convenient… If the client fills up on his/her usual service station is able to benefit from an additional discount of 40%.
4. **Pay with your points**
   Plain… The client can use their points as a method of payment

*Value computed by applying the 5% rate of Bio LPG to the total quantity of HVO produced.
Sources: [1]Cepsa, [2]ERSE

Appendix 6: National Benchmark – Repsol

Started operating in Portugal in 1990 and has since become the **second-largest player in the market.**

Possession of 464 Service Stations in Portugal. Previously owned 300 resellers of LPG. Reduced the number, in 2019, to improve the quality of the service.

Supplies LPG in cylinders, bulk and Autogas.

CARTAGENA REFINERY

Repsol will build the first production unit of advanced biofuels with low emissions, in Cartagena, in an investment of 188M€.
When concluded, in 2023, it will have capacity to an annual production of 250k tonnes of biofuels, namely bio propane.

PRODUCTS

Repsol supplies bulk LPG,directly to end consumers. The company is the third biggest operator on the bulk LPG sector.

Autogas is available in around 80 service stations, in Portugal.

DISCOUNT CARD

Repsol offers a wide range of services:

Owns **365 stores**, Sprint and RepShop and **202 of them have the car washing service**.

Repsol partners with **different football clubs, banks, big retailer companies and others to provide discounted fuel prices.** Benfica, Porto, Santander and Ageas cards offer **a 6cent/liter discount.**

Supplies a variety of customer cards, such as the Repsol Move, Solred and Pre-paid card.

The company supplies a **Via T** service that **allows Spanish consumers to pay for Portuguese highway tolls and Scuts.**

*Light cylinder is around 60% lighter than the conventional steel cylinder
Sources: Repsol

Appendix 6: National Benchmark – Prio

Prio, which has a "low-cost" strategy, is the **largest producer of biofuels in Portugal**, and the third largest producer of Biodiesel from residual waste in Europe[1].

Prio was acquired by Disa Group, the fourth largest fuel company in Spain, in August 2020[2].

Existence of more than **2k points of sale in Portugal**[1].

Possession of more than 250 Gas Stations in Portugal[1]**. 88% of Prio's customers buy LPG cylinders at Gas Stations**[3]**.**

Prio has sold approximately 1.3k LPG cylinders per day since beginning of 2021*[1]**.**

PRODUCTS

9kg Propane

45kg Propane

Prio offers Auto LPG in 30 of its 250 gas stations in Portugal.

TANKS PARK

- Prio's Tank park covers an area of 4 acres at Terminal of Aveiro.
- The Park has a total capacity of 76,292m^3.
- There can be stored diesel, petrol, biofuels, additives, slops, and **648 tonnes of LPG.**
- All the cylinders sold by Prio are bottled at this Park.

BIODIESEL FACTORY

- In 2006, Prio's created its biodiesel factory at the Port of Aveiro.
- The factory has a production capacity of 114k tonnes of Biodiesel per year, which corresponds to a production of approximately **7.7k tonnes of Bio LPG****.

SERVICE

21% of Prio's customers order their LPG cylinders online, a value much higher than any of its direct competitors, whose values are between 2% and 4%[3].

Existence of a Newsletter that customers can subscribe and receive by email [1].

When ordering a Prio LPG cylinder, the customer receives an insurance for home and goods, as well as a Prio's gas kit [1].

PRIO TOP LEVEL

Prio created the program Prio Top Level with Hardlevel, to collect used cooking oils in order to produce Biodiesel.
Hardlevel is the leading company in Portugal in the management of used cooking oils[4]**.**

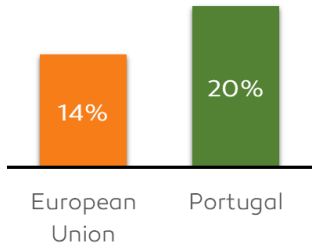
* Value computed as of 16/12/2021, according to the values displayed at Prio's website.
**Value computed by applying the 6.8% ratio of Bio LPG to the total quantity of HVO produced, as seen in Repsol.
Sources: [1]Prio, [2] Dinheiro Vivo, [3]"Tracking GPL Garrafas 2019", [4]Hardlevel

Appendix 7: Production Processes - Inputs

Biofuels

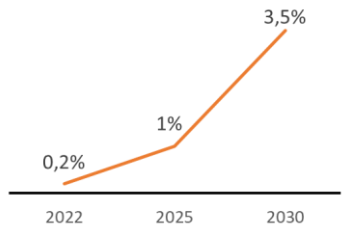
- Biofuels are considered the **liquid or gaseous fuels** used in the transportation sector and that are **produced from biomass**.
- The **European Union** emphasized the importance of the biofuels at the medium-term.
- The **indirect effect on the usage of the soil** in the biofuels' production to grow the raw materials used should be also considered.

Minimum % of **renewable energies** in the final energy consumption, in the transportation sector until 2030:



Graph 4: Min. % of renewable energies in Portugal and EU.

Minimum % of **advanced biofuels** in the final energy consumption, in the transportation sector (EU):



Graph 5: Min. % of advanced biofuels in EU.

Advanced Biofuels Listed Sources

Raw materials listed to produce advanced biofuels, whose contribution is the **double of their energy content**:

- **Algae**, if cultivated on land, in ponds, or photobioreactors.

- **Nutshell**

- **Glycerin**

There are **14 other energy sources included**, such as:

- Biomass fraction of mixed municipal waste;
- Biomass fraction of industrial waste;
- Straw.

*All listed sources are included in the appendix
Source: [1]RED II

Appendix 7: Production Processes

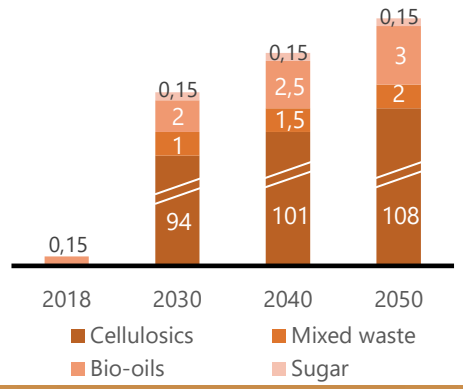
PRODUCTION PROCESSES

BIO LPG PRODUCTION

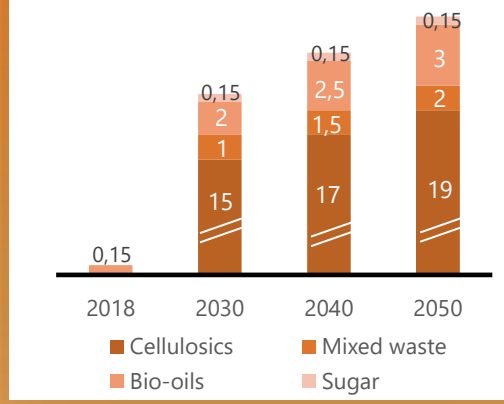
Bio LPG can be produced through three different paths: Conventional Chemical Processes (using bio-oils), and Biological Processes (using sugar) and the Advanced Chemical Processes (using cellulosics and mixed waste).

Even though **cellulosics and mixed waste constitute the main sources for Bio LPG production, the most significant market trend is conventional refiners making Bio LPG by co-processing bio-oils together with petroleum intermediates.**

Main potential sources for the Global production of Bio LPG (values in millions of kilotonnes)[2]



Main potential sources for the production of Bio LPG in Europe (values in millions of kilotonnes)[2]



- **Conventional Chemical Processes**
  - Hydrotreating
  - Dehydration
- **Biological Processes**
  - Fermentation
  - Hydrolysis and Fermentation of Cellulose
  - Digestion of Organic Waste
- **Advanced Chemical Processes**
  - Gaseous Conversion
  - Liquid Conversion and Synthesis

Sources: [1]MDPI – "Process Technologies and Projects for BioLPG", [2]WLPGA and Atlantic Consulting

Appendix 7: Production Processes

PRODUCTION PROCESSES

HYDROTREATING

Conventional refiners are co-processing bio-oils together with petroleum intermediates and making **Bio LPG as a by product**, **using the hydrotreating method.**
The process **converts triglyceride bio-oils to biofuel, often called HVO,** which comes from "hydrotreated vegetable oil".
Co-processing can be done in existing hydrotreaters or hydrocrackers with some modifications.

Total Production: 200k kilotonnes*.

Feedstock: The one with the most commercial significance are Bio fatty acids along with bio-oils. However, other feedstocks can be used, such as propylene, butylenes, and dimethyl ether (DME).

Technical Readiness: Hydrotreating is a **mature process, being the only process already in a commercial stage**. Nearly 30 commercial projects exist worldwide.

Companies that use the hydrotreating process

DEHYDRATION

Dehydration is already being used by 3 operators to **produce minor quantities of Bio LPG, specifically biopropane, as a by product.** Other projects are still in a conceptual stage. The process consists on removing water from a larger molecule.

Technical Readiness:
The process is mature, but it is at a pilot demonstration level.

Companies that use the dehydration process

Feedstocks

The ones mainly used are **bio-oils and glycerine**. Petrobras and Tesoro are reportedly feeding bio-oils to fluid catalytic crackers in conventional refineries.

BioFuel Solution is investing in using glycerol as a feedstock.

Renewable Energy Group is investigating the production of 65k tonnes/year of biopropane from glycerin.

* Values as of 2018, with 100k kilotonnes having been branded as such for sale, and the remaining 100k having been used for internal consumption.
Sources: [1]MDPI – "Process Technologies and Projects for BioLPG", [2]WLPGA and Atlantic Consulting

Appendix 7: Production Processes

PRODUCTION PROCESSES

FERMENTATION

Fermentation is the **conversion of sugars by bacteria, yeasts or other microorganisms, in the presence of air, into other products**. In this process, Bio LPG is the main result of production.

PRODUCTION

Global Bioenergies converts sugar beets and sugarcane to isobutylene at a demonstration plant in Germany, with a reported **capacity of around 150 tonnes/year.**

The company uses the IBN-One process that avoids the need for distillation, as the butylenes and propylenes are emitted as gases.

Technical Readiness: Fermentation has been proven at **laboratory scale**.

Feedstocks: Glucose, sugarcane, sugar beet (LC sugars), butyraldehyde.

HYDROLYSIS AND FERMENTATION OF CELLULOSE

Hydrolysis is a process to **break down cellulose into sugars.** After, **these can then be fermented into other products.**

PRODUCTION

Production is based on 2 approaches:

1. Treating the cellulose with **steam and acid** to break it down
2. Treating the cellulose with **enzymes**

Technical Readiness: The process is still at a **conceptual stage**.

Feedstocks: Common feedstocks are straw and stover (stalks and leaves of corn/maize plant). Wood is also a possibility but requires more up-front processing to chop it up.

DIGESTION OF ORGANIC WASTE

Digestion treatment, i.e. anaerobic fermentation, is used on organic wastes with high water content, such as manure, sewage sludge or food remains.

PRODUCTION

The output of production is commonly 50% methane, and the other 50% are composed of carbon dioxide, organic acids and nitrogenous compounds, called Biogas.

Biogas is a source of energy in 2 ways:

1. **Combustion on site** in an internal-combustion engine
2. **Clean and upgrade it to biomethane and inject that into the natural gas grid**

Technical Readiness: The process is still at a conceptual stage. **Flogas is already using a propane enriched biomethane.**

Sources: [1]MDPI – "Process Technologies and Projects for BioLPG", [2]WLPGA and Atlantic Consulting

Appendix 7: Production Processes

PRODUCTION PROCESSES

GASEOUS CONVERSION

Gaseous conversion of biomass can be done by **gasification or pyrolysis**. Both processes involve **submitting the feedstocks to high temperatures and pressures.** Nonetheless, the gasification method involves the presence of air and/or steam, which does not happen in pyrolysis. Both methods are still in the **demonstration stage.**

GASIFICATION

Gasification blasts the feedstocks into syngas, mostly carbon monoxide and hydrogen

+700 Celsius

5-10 bar

PYROLYSIS

Pyrolysis converts the feedstock into an oil. The temperature and pressure are less severe

+ 300-600 Celsius

Ambient pressure

Feedstocks: Cellulosics and waste. A well-known application of pyrolysis is the conversion of wood to charcoal. The product here is the char, while the gases and oils are vented.

LIQUID CONVERSION AND SYNTHESIS

Liquefication involves **feedstock to high temperatures and high pressures, as in the pyrolysis process**. **Synthesis takes the smaller molecules created by liquid conversion and converts them into fuels.**

LIQUEFICATION

Uses wet hydrocarbon feedstock with moderate temperatures and high pressures.

+400 Celsius

The output is called bio-oil with high oxygen content.

SYNTHESIS

The synthesis process is **used with one of the previous three examples, gasification, pyrolysis and liquefication.**
One method capable of producing Bio LPG is the Fischer-Tropsch, that yields **around 7.5% of Bio LPG from total output.**

Technical Readiness: For **biomass or organic wastes**, **none of the advanced chemical processes have gone commercial.** This is mainly due to their economic unattractiveness and technical challenges.

Sources: [1]MDPI – "Process Technologies and Projects for BioLPG", [2]WLPGA and Atlantic Consulting

Appendix 8: International Benchmark - Repsol

Repsol was founded in **1987** as the result of the reorganization of the energy sector in Spain and privatized in **1997**. The company produces, refines, and generates energy[1].

Holds approximately **5k** service stations in Spain, Portugal, Italy, Mexico and Peru. Operates in **34** countries[1].

10 million customers around the world[1]

Compromise to a zero balance of CO_2 emissions until 2050[1]

CO-PROCESSING

The objective is to increase the production of high-quality biofuels derived from HVO, as Bio LPG, by 600k tonnes until 2030.

NEW UNIT OF PRODUCTION

Repsol will build the **first production unit of advanced biofuels with low emissions**, in Cartagena. The expected investment is around **188M euros** and will allow to process recycled materials[1].

When concluded, in **2023**, it will have capacity to an annual production of **250k tonnes of biofuels, as hydrobiodiesel, biojet, bionaphtha, and biopropane**, that will have as main destiny the supply of **planes, trucks, and cars (Auto LPG)[1].**

The company expects to **reduce about 900k tonnes of CO_2 emissions**, achieving that way a leadership position in biofuels production and energy transition[1].

REFINERIES

Repsol operates **six refineries:** five in Spain and one in Peru. It also holds an integrated **petrochemical complex** in the Sines refinery[2].

Sources: [1]Repsol, [2]ERSE

Appendix 9: International Benchmark – ECB Group

ECB GROUP PARAGUAY

BIOFUELS PRODUCTION

ECB Group is the **biggest biodiesel producer in Brazil**, with an **annual capacity of 828M liters**.

"ECB Group believes that biofuels are the best option to perform the energy transition the world asks for"
Erasmo Carlos Battistella, founder of ECB Group

In 2019, ECB Group and the government of Paraguay come to an agreement to launch the **project Omega Green, the biggest private investment** in the history of the country.

BIOREFINERY OMEGA GREEN

Biorefinery Omega Green is going to be **built in Paraguay, near Asunción, until 2024** with a total estimated **cost of US$ 800 million**. It will be the first advanced biofuels production plant in southern hemisphere.

With the construction of the biorefinery, ECB Group is going to become the biggest advanced biofuels producer in the southern hemisphere.

CO-PROCESSING

The biorefinery will have a production capacity of 20k barrels per day, around **1.15 million m³ annually, combining HVO, SPK, biojet, and Green Naphtha**. HVO, as the main product to be produced in the biorefinery, will allow to a **production up to 57,500 m³ annually of Bio LPG*.**

PARTNER COMPANIES

bp

On the 5th of January 2021, ECB Group Paraguay and BP celebrated the signing of a contract to sell more than 1k million litres of advanced biofuels.

"This deal with a great Brazilian producer is a huge opportunity to strengthen our position in South America and offer low-carbon biofuels to our customers in the road transportation and aviation sectors."
Carol Howle, BP trading & shipping Executive Vice-President

ECB Group Paraguay signed a deal to provide to Shell more than 500M litres of HVO and biojet annually, starting in 2024.

"We are glad to work with ECB in order to supply low-carbon biofuels to our customers around the world."
Odeh Khoury, Shell trading & shipping Vice-President

*Value computed by applying the 5% ratio of Bio LPG to the total quantity of HVO produced.
Sources: [1]ECB Group, [2]Argusmedia, [3]Biodieselbr

Appendix 10: International Benchmark Analysis of Producers – Neste

NESTE

PRODUCTION

Neste is the world **number one producer of biopropane[1].** It started its production and sale in 2018, in the world's first biorefinery. The company supplies biopropane in 9 countries, through SHV Energy.[1]

The company has the capacity of producing **40k tonnes of Biopropane[2] per year.** The amount produced will be sold in the European Market.

The biopropane is generated as a subproduct of the production of other fuels, through a hydrotreating process, based on a propane rich mixture. The process is developed under the **NEXBTL** technology.

NEXBTL

The company possesses a proprietary refinery process, that allows the production of a high-quality biofuel, with a similar chemical structure to fossil fuels. This allows the biopropane to be used as an immediate substitute[1].

PARTNERSHIPS

SHV ENERGY

A 4 year contract with SHV Energy to distribute the Bio LPG produced in the Rotterdam refinery.

The Dutch Mcdonald's partnered with HAVI, **to collect used cooking oil from the brand's restaurants. The oil is used** to produce biopropane[1]**.**

OAKLAND 1852

Oakland's (USA) restaurants **supply used oils to be refined and used in the city's public transports**[1].

Sources: [1]Neste, [2]LPGas

Appendix 10: International Benchmark Analysis of distributors - SHV

SHV ENERGY

SHV Energy is a dutch company that leads the Bio LPG distribution. The company's business model is decentralized, **working through subsidiaries to personalize its offering** to each one of the 25 countries in which it operates.[1]

SHV Bio LPG portfolio includes:

The company supplies **Auto LPG**, in the French market.

Biopropane is also distributed in cylinders to be used in multiple activities such as cooking, water heating, farming, industrial activities and transportation.

The **company plans to expand its portfolio to other fuels such as** rDME, Hydrogen and other fuels such as methanol and electricity.

DISTRIBUTION

SHV Energy distributes Bio LPG in 10 European countries[1], through its subsidiaries Calor and Primagaz. In 2019, SHV's distribution was approximately **49k tonnes of Bio LPG**[1].

CALOR — Responsible distribution in the UK and Ireland.

PRIMAGAZ — Distributes in the Netherlands, Denmark, Sweden, Germany, Czech Republic, Belgium, France and Spain.

The distribution is done under the **mass balance principle**[1].

As Bio LPG and convencional LPG present the same chemical structure, they can be mixed in the same distribution grid, improving the efficiency of the distribution.

Sources: [1]SHV Energy, [2]Calor

Appendix 11: International Benchmark National Analysis of UK distributors

CONSUMER

Consumer **spending on sustainable products reached £41.1 billions in 2018[2].**

Around £10 billions were spent in improving British **homes energy efficiency**

43% British consumers will **consider choosing a rival retailer if they offer sustainable options** [1].

17.2 million British consumers **plan to switch to online shopping** permanently[3].

79% consumers would switch from retailer due to delivery method[4].

CALOR

The company supplies:

FORCES

- Provides **out-of-hours emergency and maintenance** service[5].
- **Highly informational** website, **easy to navigate[5].**
- **Bigger portfolio** of Bio LPG products and services: Bottled, Bulk and Auto.
- **Wide variety of partnerships** with local businesses.
- Enables an **easy shift** to Bio LPG[5].

AVANTIGAS

The company supplies:

FORCES

- **Price match** challenge*.
- Reliable emergency and maintenance service.
- Easy **online billing, purchase and account management**.
- Distribution made **under Avantigas brand**.
- **Emissions reduction calculator**.
- **Transparent** billing.

FLO GAS

The company supplies:

FORCES

- **Competitive prices*[6].**
- **Larger national coverage**[7].
- Good **online customer service and purchase**[6].
- Specialized offer for dairy farms[7].
- The only company that supplies electricity as well.
- Invests in carbon offsetting projects[7].

The company supplies Bio LPG in these formats.

*based on our previous analysis of prices

Sources: [1] Social Value, [32]The guardian, [3]The Retail Gazette , [4]Ecommecer News, [5]Calor, [6]TrustPilot, [7]Flogas

Appendix 11: International Benchmark National Analysis of UK distributors

CALOR

Calor partners with a variety of local businesses.

ANAM coffee

Anam is an organic coffee business powered by propane gas and Bio LPG in Burren.

St Tola Irish Goat Cheese

Produces local goat's cheese and uses Bio LPG for water boiling and heating[1]

"Calor is easy to work and interested in small business, and easy to communicate."[3]

– Siobhan Ghairbhith, Director

BrookLodge & Macreddin Vilage

★★★★

Switched to Calor Bio LPG 100% renewable energy. It used in the 2 pools, spa, floor heating and eight kitchens[1].

Burren Smokehouse

Use Bio LPG for heating water in the smoked salmon production.

FLO GAS

Flogas invests in carbon offsetting projects[2].

Huóshui Grouped Small Hydropower

95 small-scale hydro power plants that generate renewable energy in rural China.

Kariba REDD+

A forest conservation project in Zimbabwe, Africa.

Nafa Naana

Provides access eco-friendly equipment, including efficient LPG cooking stoves, in Burkina Faso.

Sources: [1]Calor IE; [2]YouTube, Flogas

Appendix 12: International Benchmark National Analysis of France distributors

CONSUMER

79% of consumers prefers "Made in France" products, to support the local economy and guarantee of high quality[2].

In 2019:

67%
- Changed to a more responsible consumption[2].

13%
- Try to reduce the impact of their consumption[2].

Growing interest in "sustainable products".

PRIMAGAZ

Launched the **Primagaz Next** business project strategy.

The company supplies:

FORCES

Regularly has **price promotions** on the purchase of gas cylinders.

Sponsorship Gas Tank, the sponsor earns 100€ and give 100€ to the new customer[3].

Involved in **sustainable projects**, as the Ekodev (installation of beehives)[3].

FINANCIAL RESULTS

With the switch from Twiny to **Bio Twiny**, the sales are up **+19%** in 2020[4].

Butagaz

Aims to meet the **greenhouse reductions target** by driving innovation.

The company supplies:

FORCES

Carbon Offset projects, compensated 470k tonnes of CO_2, in 2019[5].

ISCC PLUS certified, guarantees the traceability of raw materials in value chain[6].

Local green gas, it is produced in France from vegetable oils and recycled oils.

FINANCIAL RESULTS

Weight of **green gas sales** in the total gas sales[7]:

2019 0,17% → 2020 **2%**

The company supplies Bio LPG in these formats.

Sources: [1]Tax Foundation, [2] Societe Generale, [3]Selectra, [4]Primagaz FR, [5]Butagaz FR, [6]Hello Watt,[7]Butagaz CSR Report 2020

Appendix 12: International Benchmark National Analysis of France distributors

CYLINDER PRICES

Small Propane Gas Cylinders:

Bio Twiny 5,1 kg ✓

Refill: 18.90€[1]

€3.72 per kg

Le Cube 5 kg

Refill: 18.90€[1]

€3.80 per kg

10kg -13 kg Butane Gas Cylinders:

Viseo Biobutane 10kg

Refill: 25.90€[1]

€2.59 per kg

Butane 13kg

Refill: 33.50€[1]

€2.58 per kg

13kg Butane ✓

Refill: 29.90€[1]

€2.31 per kg

13 kg Propane Gas Cylinders:

13 kg Propane

Refill: 30.90€[1]

€2.38 per kg

13 kg 20% Biopropane

Refill: 29.99€[1]

€2.31 per kg

CONSUMER REVIEWS[3]

PRIMAGAZ

20% Bio Propane 13kg

★★★★ Philgeorges60 – 9 months ago*

Very good.

Product corresponding to the expectation, nothing to add.

★★★★ John_S – 9 months ago*

Very standard.

A little heavy, but we handle less often. Economical size, for outdoor usage.

Butagaz

Viseo Biobutane 10kg

★★★★ Slayer, 1-year ago*

Conventional, easy to install.

I have a gas stove, 3 cylinders per year are sufficient.

★★★★ Nouno10, 1-year ago

Super Practical.

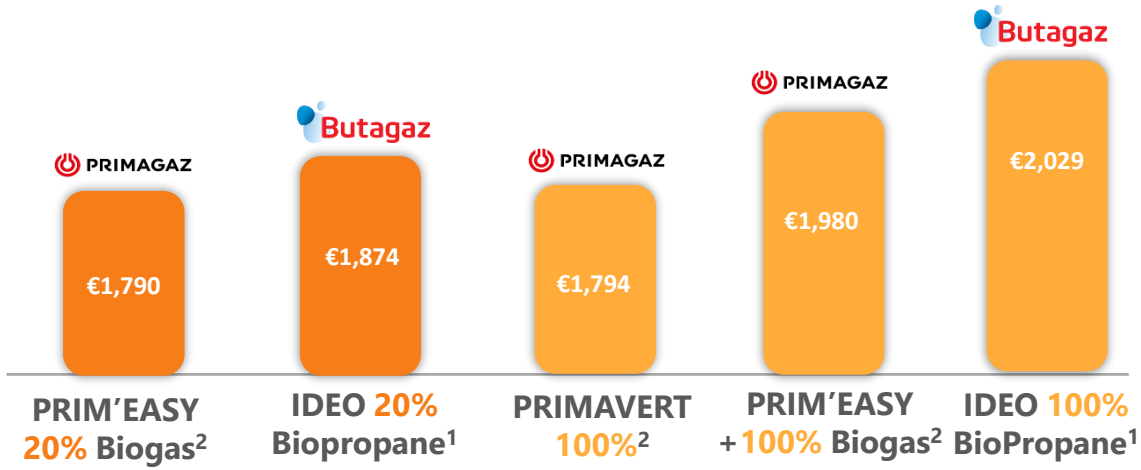
I use it for my gas barbecue, and it lasts a long time.

Sources: [1]Le Propane, [2]Primagaz FR, [3]Castorama

Appendix 12: International Benchmark National Analysis of France distributors

TANK PRICES

Comparison of the price of LPG per tonne, in the available plans of each company



INNOVATION

Butagaz

Cylinder vending machine, is an automatic gas cylinder dispenser, available 24/7 quickly, and securely.

PRIMAGAZ

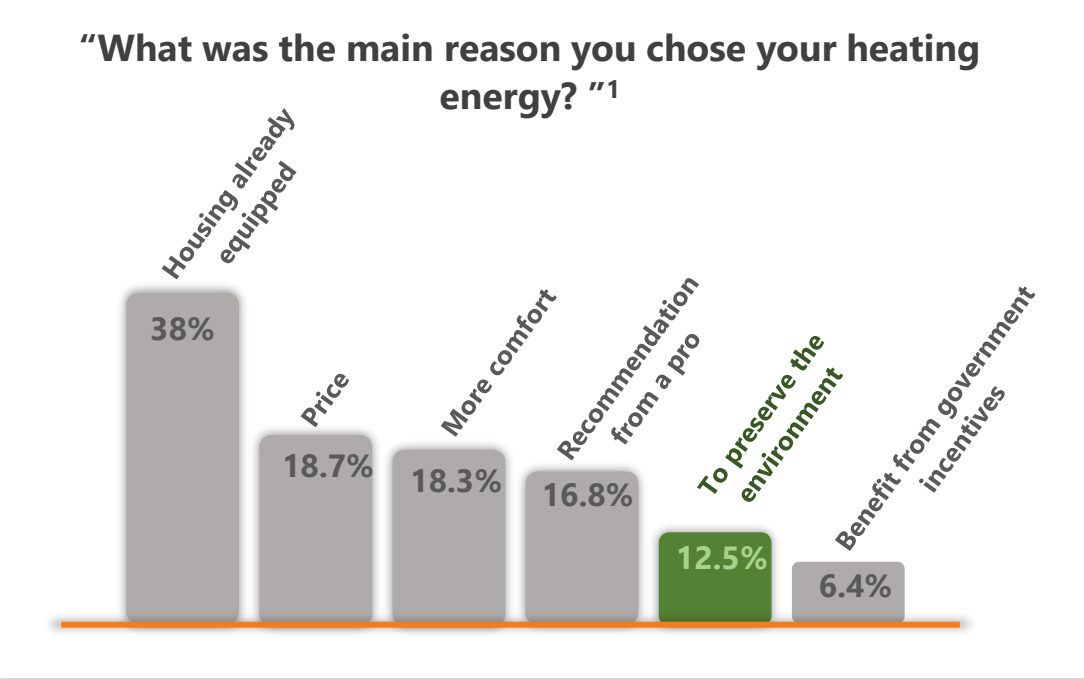
Participation in **sports and leisure activities to raise awareness**. For example, the *Grand East Mondial Air Balloons*, where all the hot air ballons used biopropane of Primagaz[2].

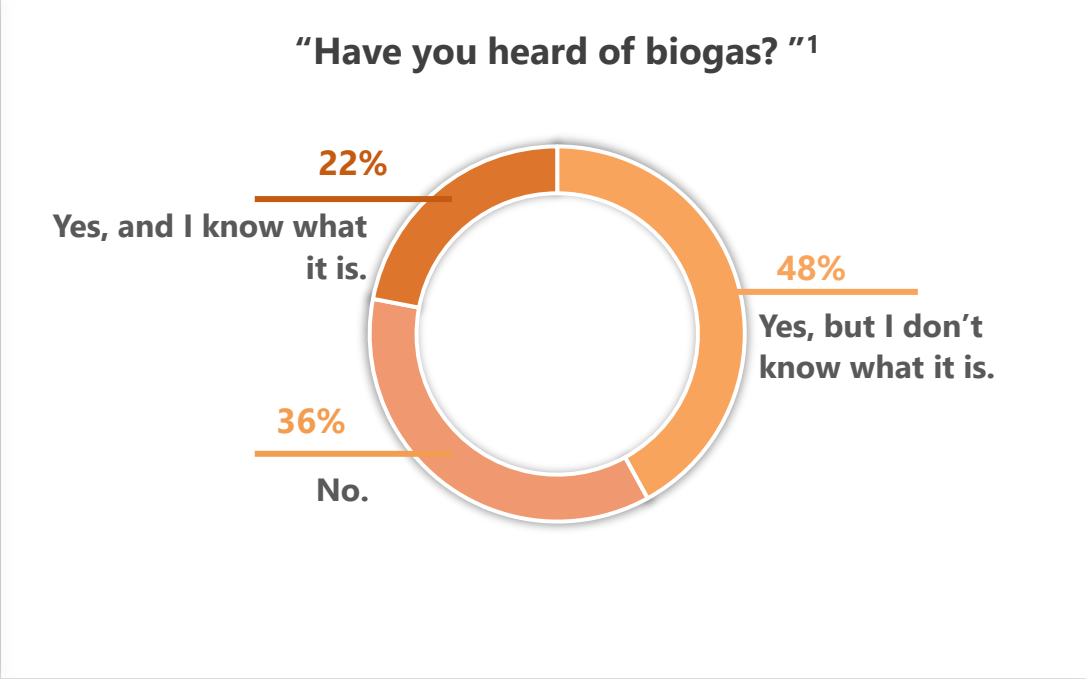
Sources: [1]Le Propane, [2]Primagaz FR

Appendix 12: International Benchmark National Analysis of France distributors

The energy mix in the regions- Study of IFOP & Primagaz, in 25 Jully of 2019[1].

- The *Institut français d'opinion publique* (IFOP) is an international market research company.
- In this research, the sample is composed by 5,509 people, representative of the population **living in communities without access to natural gas**[1].





Sources: [1]Primagaz FR

Appendix 13: International Benchmark Analysis of Distributors - Primagaz FR

TESTIMONIALS

LA ROCHE-POSAY

- In 2018, Bio LPG started to be used in **manufacture of dermo-cosmetic products** under the brand *La Roche-Posay*[1]. In 5 years, it will deliver **150 tonnes per year**, saving **1,915 tonnes of CO_2 per year**[2]*.

- The energy transition also involves raising awareness of sports and leisure activities. All hot air balloons were supplied in biopropane at the **Grand East Mondial Air Balloons** festival, in **total more than 200 tonnes**, in 2019[1].

OFFERS

Public Sector:

Crescendo Collectivités

It is an energy pooling adapted to the **municipality or an inter-municipal**, which Benefits from the **reduction of propane gas tariff**, and **meeting the needs of buildings,** such as heating. The company offers the possibility to choose 100% biopropane.

Example of public client:

Fresnicourt-le-Dolmen

It is a small city in Pas-de-Calais (North of France), that desired to **accelerate the municipality's energy transition** to achieve carbon neutrality by 2050, saving each year 5.5 tonnes greenhouse gases[1].

Private Sector:

PRIM'EASY Green Offers

Allows a **better financial control** for the customers as it offers fixed prices for 3 or 5 years.

PRIM'EASY 20% BIOGAS[1]
From 110€ Incl. Tax / month*
Fixed price for 3 years + overhead tank
1,790€ price of LPG per tonne[1]

PRIM'EASY +100% BIOGAS[1]
From 142€ Incl. Tax / month*
Fixed price for 3 years + overhead tank
1,980€ price of LPG per tonne[1]

PRIMAVERT[1]
100% biogas - offer for those who have new house built
1,794€ price of LPG per tonne[1]

*Excluding all taxes of fixed gas. Calculated on the basis of an annual consumption of one (1) ton of LPG (subscription included) reduced to the month.
Sources: [1]Primagaz France, [2]SHV Energy

Appendix 14: International Benchmark National Analysis of Denmark distributors

CONSUMER

Over the last 40 years, **consumer spending on housing (including heating) increased from 23% to 28%**[5].

Consumers prefer **National products and traditional brands and are relatively open to new products**[5].

Approximately 83% of the Danish citizens are internet users, which **has boosted e-commerce**[5].

61% of consumers claim to be influenced by **recommendations on social networks**[6].

kosangas

Leader in the LPG cylinder market, with **60% market share.**

The company supplies:

- **Self-service stores opened 24/7 and more than 1.5k resellers**[2].
- **Broad Bio LPG offer**, 20%, 30%, 40%, and 100% Bio LPG options[2].
- **Service contract** to provide the client **regular verifications to gas equipment**[2].
- **Intuitive and easy to use website.**
- **The price of 40% Bio LPG is approximately 10% cheaper than its conventional LPG counterpart**[3].
- Communication focused on the **technical expertise**, and on the **promotion of LPG as a safe and clean energy.**

PRIMAGAZ DK

Part of SHV Energy, **the world leader on LPG distribution.**

The company supplies:

- Approximately **750 resellers**[1].
- **Bio LPG offer** consisting of 20%, 40%, and 100% Bio LPG[1].
- Primagaz **buys the percentage of Bio LPG without the product being transported** to Denmark.
- One of the main topics of customer dissatisfaction regards **the price for the kilograms acquired**[4].
- Communication focused on Bio LPG's **environmental benefits, production process,** and on **clients' success stories.**

The company supplies Bio LPG in these formats.

Sources: [1]Primagaz DK, [2]Kosan Gas DK, [3]XL Byg, [4]Trustpilot, [5]Santander, [6]Deloitte

Appendix 14: International Benchmark National Analysis of Denmark's distributors

BIO LPG CYLINDERS

40% Bio LPG

5kg Kosan Gas BioMIX40	10 kg Kosan Gas BioMIX40	11kg Steel
		
19.49€*	23.53€*	28.10€*
3.90€ per kg	2.35€ per kg	2.55€ per kg

20% Bio LPG

5kg Light Cylinder	10kg Light Cylinder	11kg Yellow
		
29.06€*	43.94€*	45.37€*
5.81€ per kg	4.39€ per kg	4.12€ per kg

BULK BIO LPG

Available Options:

- 30% Bio LPG
- 40% Bio LPG
- 100% Bio LPG

- 40% Bio LPG
- 100% Bio LPG

CLIENT SUCCESS STORY

"We are focused on reducing CO_2 emissions as much as possible, so, Kosan BioMIX was an obvious choice for us. With the amount we have bough so far, **we have already saved the environment 437 tonnes of CO_2.**"
Tina Møller, Marketing and Innovation Director

* 1 DKK = 0,134447 EUR.
Sources: XL Byg, Kosan Gas, Primagaz

Appendix 15: International Benchmark Analysis of Producers - Eni

- **Eni is an Italian LPG producer and distributor**, whose main investments are in new technologies of production that allow **to reduce the emissions of greenhouse gases, through the development of sustainable biofuels**.
- In 2019, the company sold more than **73k millions m^3 of gas around the world**.

BIOREFINERY OF VENICE

- In 2014, it became the **first conventional refinery in the world to be converted**.

The conversion of the refinery represented a total investment of **100 million euros**, comparatively with the 600 million euros from the estimated cost to build a biorefinery from scratch.

- Since 2014, the company transforms annually **230k tonnes of vegetable oil into biofuels**.

It is scheduled to 2024 an expansion of the company's facilities, allowing to **increase the processing capacity to 560k tonnes** of vegetable and used oils, and food wastes.

BIOREFINERY OF GELA

The conversion of the refinery represented a **total investment of 300 million euros, in 2019**.

It has an **annual processing capacity of 750k tonnes** of used vegetable oil, frying oil, fats, seaweed, and advanced by-products.

PRODUCTION

304k	**Tonnes of biomass transformed into:**
204k	Tonnes of Biofuel (HVO)
38k	Tonnes of Bio-naphtha
14k	**Tonnes of Bio LPG**

Source: Eni

Appendix 16: International Benchmark Analysis of Producers – Preem (I/II)

Preem, which resulted from a merger between **Texaco Stations** in Sweden and **OK Petroleum** in Southern and Western Sweden, is **the largest fuel company in Sweden,** accounting for 80% of the Swedish refining capacity; and **one of the country's most prominent exporters**, with 80% of its production being exported[1].

In 2019, Preem set the **goal of reaching carbon neutrality in 2045.** Until 2030, the company aims to **produce 5 million cubic meters of renewable fuels, namely Bio LPG, which would allow a reduction of 12.5 million tonnes of CO_2,** corresponding to 20% of Sweden's current emissions[1].

BIO LPG

Preem's **Bio LPG is produced from hydrogeneration and co-processing.**

The Bio LPG is **marketed by Kosan Gas** [2].

ADDITIONAL FORCES

Compared with the average refinery in Western Europe, Preem's refineries **emit 17% less CO_2, 72% less nitrogen oxides, and 94% less sulfur oxides[1].**

- **Gothenburg Refinery:** In 2020, Preem invested 50 million euros* to increase the Green Hydro Treater (GHT) capacity of the refinery. The redevelopment resulted in an **increased production capacity of renewable diesel by 40% and allowed the GHT plant to produce 100% renewable products.**
- **Lysekil Refinery:** In 2020, Preem began the refinery's reconversion, to **process up to 40% renewable raw materials.** With this reconversion, the annual climate emissions are expected to decrease by 1.7 tonnes[3]. The plant is expected to be operational by 2024, at the latest.

Sources: [1]Preem, [2]WLPGA and Atlantic Consulting, [3]BioFuels International.
Amount computed according to the exchange rate of the 30th December 2019
Note: Explanation about some investments of the company associated with renewable fuels in the Appendix 11.

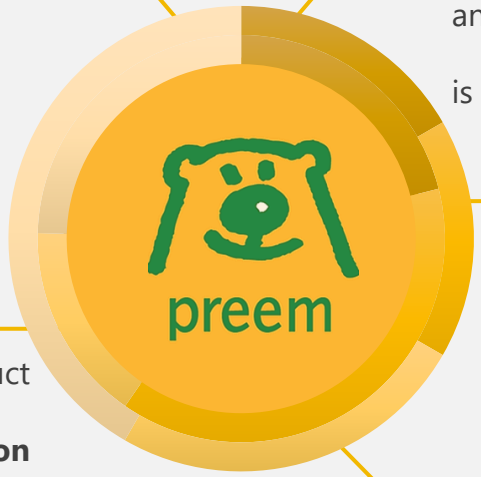
Appendix 16: International Benchmark Analysis of Producers – Preem (II/II)

Stake in SunPine

Preem has a stake in SunPine, a **world-leading bio-refinery which supplies sustainable products based on tall oil**, a residual product from kraft pulp mills[1], a raw material used to make tall diesel. SunPine produces **approximately 105 million litres of tall diesel per year.**[2]

Pyrocell: jointly owned company with Setra

Preem and Setra, one of the Swedish largest wood product companies, **started a collaboration for the first production plant of fossil-free pyrolysis oil, extracted from sawdust**. The facility is expected to **provide approximately 25k tonnes of pyrolysis oil per year, corresponding to the annual fuel consumption of 15k cars.**



Partnership with RenFuel and Rottneros

Preem, RenFuel, and Rottneros, **will build the world's first lignin plant for biofuels**, which is expected to be completed by 2021 and to produce 25k to 30k cubic meters of lignin annually. Lignin is then used to produce renewable gasoline and diesel.[1]

Biozin Holding AS

Preem has a stake in Biozin Holding AS. **Biozin is an advanced, durable bio-oil which can be used directly or be mixed with fossil fuels.** The company's annual production capacity is of **120k cubic meters per year.**[1]

Letter of intent with SAS for biojet production

Preem and Scandinavian Airline System (SAS) have signed a letter of intent to produce 300k cubic meters of biojet at Gothenburg refinery, starting at the end of 2022.[1]

Sources: [1]Preem, [2]SunPine

Appendix 17: International Benchmark Analysis of Producers – Total

Total is **the leading distributor of Biofuels in Europe.** Over the last decade, the company has spent **more than €500 million on biofuel Research and Development**[1]**.** Total is currently active in more than 130 countries and operates along the entire energy value chain.[1]

BIO LPG

- Given that **Total's Bio LPG is produced through co-processing of HVO**[2], and that Total has an **annual production capacity of 500k tonnes of HVO at its biorefinery of La Mède,** applying the 5% rate of Bio LPG to the total quantity of HVO produced, there can be concluded that the company has a **Bio LPG annual production capacity of approximately 25k tonnes.**

LA MÈDE BIOREFINERY

- The biorefinery became operational in 2019 and **resulted from the conversion of a former oil refinery**, a project which required a **capital expenditure of €275 million**[1]. **The conversion project lasted four years**.
- The feedstock used in the refinery is made up of **60% to 70% crude vegetable oils** (including palm oil) and **30% to 40% treated waste.**[1]
- In May 2018, **the company pledged to curb the annual processing of palm oil** and to use at least 50k tonnes of French-grown rapeseed, given the **French farmers' concerns that imported palm oil would compete with locally produced vegetable oil**. Environmental activists were also against the **deforestation caused by the production of palm oil**[3].

Sources: [1]Total, [2]WLPGA and Atlantic Consulting, [3]Reuters

Appendix 18: Non-LPG Benchmark – Unilever

One in three people already purchase products with sustainability in mind[1].

Consumers are becoming **more conscious about the environment**.

People are **searching for more**, the product performance by itself is no longer enough.

69%

In 2018, the **28 Sustainable Living Brands of Unilever grew 69% faster** than the rest of traditional businesses[1].

The Ecorefill Revolution

- With this innovative technology, the consumer simply releases the super-concentrated product into a reused bottle, filling with water.
- With 10x concentrated formula, it guarantees the full effectiveness of Cif with **75% less plastic**[1].
- Reduces 87% of trucks on the road, which **decreases the overall carbon footprint of Unilever**[1].

Price: 3.49€[2]
700 ml

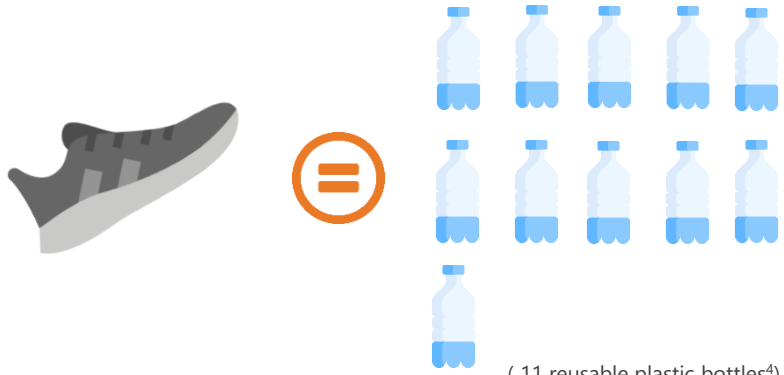
Price: 3.99€[2]
700 ml

Sources: [1]Unilever, [2]Continente

Appendix 18: Non-LPG Benchmark – Adidas

In 2015, Adidas collaborated for the first time with Parley, an organization that works to raise global awareness about the fragility of the oceans.
Together created the Primeblue material, a high-performance recycled material from plastic waste intercepted on remote islands, beaches and coastal communities[1].

10% of the growth in the revenue, to approximately 5.7 million euros*, was driven through the **sustainable products[2].**



Nowadays, the Parley's recycled materials are present in several Adidas' models, such as running sneakers like the 4D Run 1.0 Parley and Ultra Boost.

UltraBoost 21
Price: 199.95€[1]

75% of the textile is Primeblue yarn[1].

Response Super
Price: 90€[1]

*based on the exchange rate of 31/12/2019 – 1 USD = 0,89672 Euros
Sources:[1]Adidas PT, [2]Glossy, [3]Business Insider, [4] CNBC

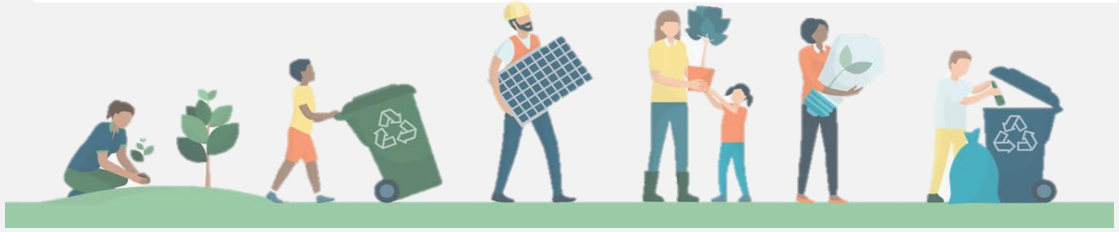
Appendix 19: Value Proposition – Consumer & Market Trends

CONSUMER TRENDS

- Increased **environmental concerns**.
- Values **brand's transparency** about its sustainable initiatives, and brands with purpose.
- **Digitalization** of the customer journey.
- Preference for a more **simplified and convenient offer**.
- Valorization for **trusted brands**.

Barriers:

- **Difficulty to perceive what is the best way** to be more sustainable.
- **Lack of visualization** of the potential impact caused by a simple change.
- Tendency to have **higher prices** for sustainable products.



MARKET TRENDS

- Common practices to distinguish the cylinders from conventional LPG ones, such as less capacity, lighter cylinder and differentiate design.
- **Wide variety** of Bio LPG in bottled and bulk format, with a **minimum** incorporation of **20%** of Bio LPG.
- **Improvement of the online experience** – such as online purchase, account management and highly informational websites.
- **New distribution channels**, namely self-service stores.
- Focus on **partnering with local businesses and events**.
- Involvement on **carbon offsetting projects** to promote the energy transition.
- **Lack of an integrated offer** trend.

Appendix 19: Value Proposition – 4 Pillars: Product

Trend

PRODUCT

DEMAND FOR ADDED VALUE FEATURES

PREFERENCE FOR SIMPLIFIED OFFERS

Solution

- **Integrated offer**
- **Minimum of 5% of Bio LPG in all formats***
- **Offer bottled, bulk B2B and auto LPG**
- **Light cylinder**
- **New sizes**
- **Cross-selling**

INTEGRATED OFFER PLANS

Product: offered in four typologies with a minimum incorporation of 20% of Bio LPG in all formats.

- **B2C:** for individual customers.
  - Domestic consumption: Bottled Bio LPG;
  - Road consumption: Auto Bio LPG.
- **B2B:** for the professional and commercial sectors: Bulk Bio LPG.

- Bio LPG offered in integrated offer plans with other energies and services, such as electricity, renewable energies (solar panels) and equipment.

Cross-selling of Bio LPG with additional services (as home-delivery) or products/equipment (such as heaters, barbecues, among others) should also be promoted as a complement to the integrated offer plans.

ADDED VALUE FEATURES

Light cylinder (*Pluma* or similar)

- Offer of bottled Bio LPG in light cylinders with improved design to create an added value feature for the consumers when comparing to the traditional LPG cylinders.

*Selected proposals will be further explained. **Even though the Benchmark Analysis evidenced that the minimum common market incorporation was 20%, Galp's experts recommended a minimum incorporation of 5% to be tested.

Appendix 19: Value Proposition – 4 Pillars: Digitalization

Trend

DIGITALIZATION

CUSTOMER JOURNEY DIGITALIZATION

OMNICHANNEL

Solution

- ***"Mundo Verde"***
- **Emissions reduction calculator**
- **Online payments and billing**
- **Guarantees of deposit**
- **Store availability**
- **Click-and-collect**
- **After-hours collect**

"MUNDO VERDE"

Complementary system in the App & Web:

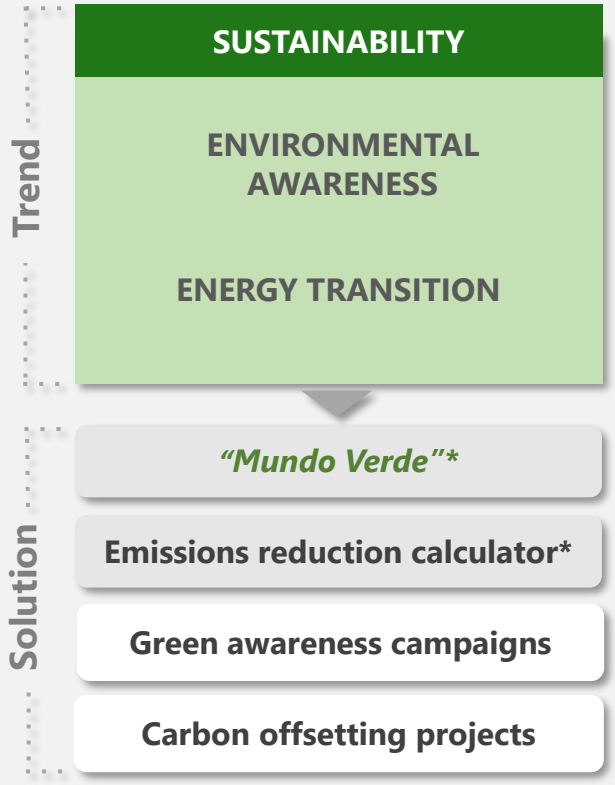
- Represents the saved carbon emissions through the consumer's consumption of Bio LPG products in an **interactive world**, which will change accordingly;
- The saved emissions can be converted into "**green coins**", which then can be used on discounts or donated to social and environmental projects.

The system allows a **clear** and **visual** perception of the impact in the environment. Also, *Mundo Verde* encourages a more **conscious consumption**, which will also transmit the sustainability pillar of the value proposition.

SERVICES

- **Guarantees of deposit:** transfer of cylinder deposit guarantees to an online version.
- **Store availability:** online access to current stock availability at gas cylinder sales points.
- **Click-and-collect:** the consumer makes the purchase online but collects the cylinder in-store.
- **After-hours collect:** resolve emergencies in the event of unexpected gas failure, outside of the opening hours, by making automatic lockers available outside sales points.

Appendix 19: Value Proposition – 4 Pillars: Sustainability



GREEN AWARENESS CAMPAIGNS

Key Message of the Green Awareness Campaigns:

- Disclose the new product and its benefits for the environment and the consumer.
- Encouraging the adoption of more sustainable behaviours.
- Promote Galp's sustainable image.

The message should be **coherently communicated through different channels**:

- Social Media
- Television
- Store and Outdoors displays
- Festivals

CARBON OFFSETTING PROJECTS

Participate in social and environmental projects to further **develop the sustainability goals and promote the energy transition.**

- Join projects that change communities' dependence on non-renewable energy sources.
- Consider countries that are related with Galp's upstream activities, such as Angola, to lessen the impact on these regions.
- Donations for the carbon offsetting projects.

*Previously presented within the digitalization pillar

Appendix 19: Value Proposition – 4 Pillars: Partnerships

Trend

PARTNERSHIPS

LACK OF PRODUCT RECOGNITION

BRAND PURPOSE

Solution

- **Partner with local lodges**
- **Partner with local product manufacturers**
- **Partner with construction stores**
- **Carbon offsetting projects***
- **Partner with festivals and events**

PARTNER WITH LOCAL LODGES, LOCAL PRODUCT MANUFACTURERS, AND EVENTS

Consider the establishment of mutually beneficial partnerships with local lodges, local manufacturers, and events.

Advantages for Galp:

- Increased product and brand awareness.
- Increased recognition as a sustainable and environmentally-concerned brand.
- Gain new clients, as a viable alternative to meet emission goals and avoiding high switching costs.
- Retain existing LPG clients which were considering to switch to cleaner sources of energy.

Advantages for Local Lodges, Local Manufacturers, and Event Organizations:

- Increased perception as sustainable brands.
- Access to a cleaner and practical source of energy, while using the existing LPG facilities.

PARTNER WITH CONSTRUCTION STORES

Establishment of Partnerships with construction stores, such as Leroy Merlin. It would allow Galp to **broaden its client network** and the construction stores to broaden their product offer towards cleaner solutions and develop **cross-selling options** with Bio LPG. Both companies would enhance their brand image.

*Previously presented within the sustainability pillar

Appendix 20: Digitalization- New Services: After-hours Collect

Digitalization - **New Services** - available App "*Mundo Galp*" & Website

4) AFTER-HOURS COLLECT

- For pick-ups **after the opening hours** – available **24/7**;
- Disposition of **automatic lockers outside**, where the gas cylinder can be stored;
- Serve customers in the event of an **unexpected gas shortage**;
- **Adaptable** for the diverse type of lifestyle and availability.

ONLINE SHOPPING

App or Website:

1st Select the desired gas cylinder.

2nd Check the availability of the lockers near the address.

3rd Choose the wanted pick-up location.

4th Proceed with the online payment.

Deliver a unlock code.

GO TO THE PICK-UP LOCATION

UNLOCK AND GET THE CYLINDER

SATISFIED CONSUMER

Details:
- Option of reserve an order for a specific date, time and location.
- Available for just 24 hours in the locker.
- In the case of an existing cylinder, the consumer does not have to pay for a new cylinder, just insert the old one in the locker.

Appendix 21: Qualitative Interview Script – Bottled LPG Target (I/VI)

INTRODUCTION

- Presentation of the interviewer and the project;
- Explanation of the interview procedures: informality; sincerity; importance of all opinions (there are no wrong answers);
- Authorization for audio recording.

PART 0 – CONSUMER PROFILE

Consumers' concern about the environment has been increasing, as we have all seen extreme phenomena in nature and many of us have been affected, either by rising sea levels or prolonged droughts. To combat this trend, several practices have been adopted, such as recycling, changing to LED lamps, turning off equipment when not in use or saving water from baths or flushing.

1. Do you usually separate your garbage daily?
2. In addition to recycling, what practices do you adopt to be environmentally friendly?
3. What are the reasons that lead you to adopt these habits?
4. Do you think these practices have a real impact on the environment?
5. What do you think could happen if measures are not taken to protect the environment?

PART I – SUSTAINABILITY

We are going to start our interview with the topic of sustainability.

6. In what products, services or companies do you remember the existence of environmentally friendly products or services?

7. Do you consume any of them?
7.1. If yes,
7.1.1. Which?
7.1.2. In that case, what is it that drives you to have these consumption habits?
7.1.3. Do you pay more for this type of product?
7.2. If not, why?
8. Do you intend to change consumption habits in the next year in order to be more environmentally friendly?
8.1. If not,
8.1.1. Why?
9. What is the importance of sustainability for you in the companies you choose to purchase products or services from?
10. In the specific case of the energy market, what is the importance of the existence of sustainable energies in the services you purchase / acquire?
11. What do you mean by Bio products?
11.1. And what products do you associate with this expression?
12. What do you mean by Sustainable products?
12.1. And what products do you associate with this expression?
13. What do you mean by Green products?
13.1. And what products do you associate with this expression?
14. Among the expressions Bio, Sustainable and Green, which one do you consider to have the most positive environmental impact? Which one do you prefer?
15. For you, what is the impact on the value of a brand when introducing a Sustainable / Green / Bio product?
16. How do you value a brand that communicates to the customer the environmental impact of the products it sells?

Appendix 21: Qualitative Interview Script – Bottled LPG Target (II/VI)

PART II – CONTEXTUALIZATION
We will now focus on the bottled gas.

17. What are the advantages of consuming bottled gas?
18. What are the factors that led you to choose the bottled gas brand?
19. What brand of bottled gas do you currently consume?
20. Which cylinder(s) do you currently consume?
20.1. For what purposes do you use gas cylinders?
20.2. Are there any restrictions or physical characteristics of your home that lead you to choose a certain type of cylinder [big or small]?
21. What is your monthly consumption of bottled gas?
22. Have you ever thought about the environmental impact of gas consumption?
22.1. If yes,
22.1.1. Have you thought about any alternative energy?
22.1.2. What alternative energies do you consider feasible for a possible change?
22.2. If no, [go to question 23]
23. If there was a more sustainable version of bottled gas, would you consider a possible change?
23.1. What would your predisposition for change be?

PART III – BIO LPG
We will now focus on bottled Bio Gas.
In the bottled gas market, the possibility of introducing an alternative energy to conventional bottled gas, called Bio LPG, is currently being evaluated. Bottled Bio Gas and traditional bottled Gas are the same product, with Bio Gas being produced from more environmentally friendly energy sources. This energy does not entail any switching costs and it is a product with the same calorific power as bottled gas. Bio Gas would be mixed in the gas cylinders, according to a stipulated percentage.

24. Have you heard of this product?
24.1. If yes,
24.1.1. In what context and by what means?
24.2. If no [go to question 25]
25. What advantages do you see in the product?
26. Do you have any fear about the new product?
26.1. If yes, which?
26.2. If no, [go to question 27]
27. What is your predisposition, on a scale of 0 to 10, to start buying a cylinder with Bio LPG instead of conventional gas?
28. Would you consider changing your supplier to use this type of gas if it were only available under a different brand of gas than yours?
29. How do you think the brand image will be affected by the product offering?
29.1. What if the supplier of the Bio LPG is [interviewee's current supplier]?
29.2. What if the supplier was Galp?
29.3. What if the supplier was Repsol?
29.4. What if the supplier was Rubis Gás?
30. If there is an increase in the associated price, how much would you be willing to pay more to have this product? If you were not willing, what would be the reason?

Appendix 21: Qualitative Interview Script – Bottled LPG Target (III/VI)

[Exclusive to small cylinders]
30.1. Would you be willing to pay more for this product:
30.1.1. If it is more €2? [0 - 10]
30.1.2. So what if it is more €1? [0 - 10]
30.1.3. So what if it is more €0.5? [0 - 10]

[Exclusive to large cylinders]
30.2. I would be willing to pay more for this product:
30.2.1. If it is more €4? [0 - 10]
30.2.2. What if it is more €2? [0 - 10]
30.2.3. What if it is more €1? [0 - 10]
31. What would be the percentage of Bio LPG that you think this product should have? Have you ever thought about it?
32. Regarding other sustainable products or energies, do you have any idea of the percentage of sustainable energy that is incorporated?
33. Would you be willing to purchase the product with a 5% incorporation of Bio LPG in your cylinder? [0 - 10]
33.1. So what if the incorporation is 10%? [0 - 10]
33.2. So what if the incorporation is 20%? [0 - 10]
33.3. Do you find these incorporations satisfactory? Or would you value other options?
34. In general, would you value a cheaper product with less Bio LPG or more expensive with more Bio LPG?

[Exclusive to small cylinder consumers]
35. What is the propensity to purchase the product, on a scale of 0 to 10, if:
35.1. The product has 5% Bio Gas and costs €0.5 more than the conventional bottled Gas?
35.2. The product has 10% Bio Gas and costs €1 more than the conventional bottled Gas?
35.3. The product has 20% Bio Gas and has a cost of €2 more than the conventional bottled Gas?

[Exclusive to large cylinder consumers]
36. On a scale of 0 to 10, what is the propensity to purchase the new product if:
36.1. The product is 5% Bio Gas and costs €1 more than the conventional bottled Gas?
36.2. The product is 10% Bio Gas and has a cost of €2 more than the conventional bottled Gas?
36.3. The product is 20% Bio Gas and has a cost of €4 more than the conventional bottled Gas?
37. Which of these [large or small cylinders] would you choose to consume?
37.1. How predisposed, on a scale of 0 to 10, would you be consuming the product at your current retailer?
37.2. What if the supplier was Galp? [0 to 10]
37.3. What if the supplier was Repsol? [0 to 10]
37.4. What if the supplier was Rubis Gás? [0 to 10]
37.5. Imagine that another brand starts offering Bio LPG at the same price that you currently pay for conventional LPG, and that your retailer does not offer this product. How willing would you be to change brands?

Appendix 21: Qualitative Interview Script – Bottled LPG Target (IV/VI)

PART IV – ADDITIONAL SERVICES

Let us now look at the additional services that can be provided by your bottled gas supplier.

38. Can you identify any aspects to improve in the current service provided by your gas supplier in the cylinder?
- Payment problems
- Service issues
- Problems with availability
- Problems with transportation

39. What are the additional services that you value most at your cylinder distributor?
39.1. Why?
40. Of the following additional services, which are the three that you value most?
- Online payment in Home Delivery: Possibility to make the payment through the website or the application.
- Online deposit guarantee: Possibility of online access to the certificate of guarantee of the cylinders.
- Online access to stock availability at points of sale: Possibility of online access to the number of cylinders available at each point of sale.
- Click & collect: Possibility of online purchase and collection at the selected point of sale.
- After-hours: Possibility to purchase and collect cylinders after hours in automatic lockers outside stores or points of sale.

41. Is there any other additional service that you would like to have?

Continuing to talk about additional services, we will focus only on online payment.
42. How important is online payment when choosing a brand?
42.1. What would be your predisposition, on a scale of 0 to 10, for joining online payment?
42.2. Would you be willing to change your supplier to have this service?
Focusing now on the online deposit guarantee.
43. How important is the online deposit guarantee when choosing a brand?
43.1. What would be your predisposition, on a scale of 0 to 10, for joining the online deposit guarantee?
43.2. Would you be willing to change your supplier to have this service?
We will now focus on online access to stock availability at points of sale.
44. How important is online access to stock availability at points of sale when choosing a brand?
44.1. What would be your predisposition, on a scale of 0 to 10, for adherence to online access to stock availability at points of sale?
44.2. Would you be willing to change your supplier to have this service?
We will continue to the click and collect service.
45. How important is the click and collect service when choosing a brand?
45.1. What would be your predisposition, on a scale of 0 to 10, for joining the click and collect service?
45.2. Would you be willing to change your supplier to have this service?
Now focusing on the after-hours service, which works as a 24/7 cylinder "vending machine".

Appendix 21: Qualitative Interview Script – Bottled LPG Target (V/VI)

46. How often have you felt the need to buy LPG cylinders at night or outside opening hours?
47. How important is the after-hours service to you when choosing a brand?
47.1. What would be your predisposition, on a scale of 0 to 10, for joining the after-hours service?
47.2. Would you be willing to change your supplier to have this service?

PART V – *MUNDO VERDE*

We have just finished discussing the additional services. We will now discuss the proposal for a complement to the service provided. Imagining that your brand has an application, *Mundo Verde*, it would be an extra complement where the consumer could earn "green coins" according to the carbon emissions saved in their consumption, which can then be converted into discounts on products and services or donated to social and environmental projects.

48. Do you value the quantification of the environmental impact of your consumption, reflected in the saving of carbon emissions?
49. And if your carbon emission savings generated could be converted into points, called green coins, that could be used for discounts and donations, would your predisposition to join increase?
50. In which LPG products and services, would you consider discounting your points?
51. Would you consider donating green coins to projects that aim to reduce the environmental impact in developing countries?
51.1. Why?
52. What do you consider to be the advantages associated with this new application?
53. And do you identify any fears in using the application?
54. In view of all the features of the "*Mundo Verde*" application, on a scale of 0 to 10, what would be your predisposition for the use of this application?
55. What would be more attractive for you to include in the application?

PART VI – INTEGRATED OFFER

Speaking now of models of integrated energy supply.
56. In your household, what type of energies do you use regularly?

<u>DOMESTIC</u>
- Electricity
- Natural gas
- LPG in cylinder
- Bulk LPG
- Piped LPG
- Solar energy (solar panels)

<u>ROAD</u>
- Fossil fuels
- Auto LPG
- Electric Charging

57. Of the energies you mentioned above, which are the suppliers who provided you with the service?
58. Have you subscribed to an integrated energy supply package?
58.1. If yes,
58.1.1. What are the energies included?
58.1.2. Which company supplies the package?
58.1.3. What are the reasons that lead you to subscribe to an integrated offer package?
58.2. If no,
59. Would you be interested in joining an integrated offer package with bottled Bio LPG?

Appendix 21: Qualitative Interview Script – Bottled LPG Target (VI/VI)

Imagine that you could purchase cylinders of Bio LPG during the month without making an immediate payment, by registering the cylinder in the application, and then that amount will be charged at the end of the month on the invoice for the subscribed integrated offer package.
60. How interested would you be in this possibility?

PART VII – PARTNERSHIPS
We will now focus on bottled LPG distribution points.

61. How satisfied are you with the current bottled gas outlets?
61.1. What are the places you use the most?
61.2. Are there any places that you would like to see served by offering bottled gas?
62. How useful would you consider the distribution of bottled gas in building materials and DIY stores? Which ones?

We have now reached the end of our interview. Thank you for the availability.

Appendix 21: Quantitative Survey Script – Bottled LPG Target (I/VIII)

LANDING PAGE

Objective and context: This questionnaire was developed within the scope of the final Master's Project in Management of the Nova School of Business and Economics, with the objective of studying the preferences of Portuguese consumers in the bottled Gas market.
Anonymity: The information recorded throughout the questionnaire is anonymous and will not be analysed individually, but in an aggregate way.
Thank you very much for your availability.
The Project Team: Bruno Simplício, Madalena Louro, Maria Duarte, Pedro Horta.

Note: Throughout this questionnaire you will find the designation of electricity / gas and fuel supplier. The supplier is the entity with which it can directly contract these services (gas, electricity) or purchase the product (fuel) and with which it establishes a commercial relationship.

PART 0 – FILTERS

1. Do you consume bottled gas? (Multiple Choice - Single Answer)
A. Yes
B. No
If Q1 = B, [Finish]
2. How do you participate in the selection of bottled gas supplier? (Multiple Choice - Single Answer)
A. Decision maker
B. Influencer
C. I do not participate
If Q2 = C, [Finish]
3. In which sector of activity do you work? (Multiple Choice - Single Answer)
A. Banks / Insurance
B. Industry
C. Public administration
D. Agriculture
E. Market studies
F. Marketing
G. Energy
H. Pharmacies / Parapharmacies
I. Telecommunications
J. Other: _____
K. I have no active professional occupation
If Q3 = E, F, or G, [Finish]
4. At this moment, does anyone in your household work in a bottled gas or other energy supply company? (Multiple Choice - Single Answer)
A. Yes
B. No
If Q4 = A, [Finish]

Appendix 21: Quantitative Survey Script – Bottled LPG Target (II/VIII)

PART I – SUSTAINABILITY

5. Which of the following practices do you regularly adopt? (Multiple Choice - Multiple Selection Box)

- Recycling
- Changing to LED lamps
- Water saving methods
- Disconnect equipment when not in use
- Composting / Organic Waste
- Use of reusable or biodegradable bags (cardboard)
- Others: _____
- None

6. Select what factors you took into account when adopting these practices: (Multiple Choice - Multiple Selection Box)

- Sustainability
- Savings
- Well-being
- Health
- Others: _____

7. What is the word you prefer to see associated with environmentally friendly products? (Multiple Choice - Single Answer)

- Bio
- Sustainable
- Green

8. When a brand has sustainable / environmentally friendly products, what impact does it have on the image of that brand? (Multiple Choice - Single Answer)

- Improves
- Stays the same
- Worsens

PART II – CONTEXTUALIZATION

9. Which of the following advantages do you consider to exist when consuming bottled gas instead of another type of energy? (Multiple Choice - Multiple Selection Box)

- Portability / Being transportable
- Failure to pay fees in addition to the gas / energy consumed (You pay only for the product consumed without another associated tax)
- Cost / Price
- Calorific power
- Cooking on a gas stove
- Other: _____
- No advantage

10. What brand of bottled gas do you consume regularly? (Multiple Choice - Single Answer)

- Cepsa
- Galp
- OZ
- Prio
- Repsol
- Rubis Gás
- Other: _____

Appendix 21: Quantitative Survey Script – Bottled LPG Target (III/VIII)

11. What were the factors that led you to choose your brand of bottled gas? (Multiple Choice - Multiple Selection Box)
- Price
- Quality
- Convenience / Proximity
- Brand confidence
- Lack of knowledge of other brands
- Brand recommended by family member or friend
- Have already the reducer of the brand
- Discounts and Promotions
- Brand that was already a customer in other products or services
- Reseller or known employee
- Brand already used by my parents
- Other: _____

12. What kind of cylinders do you consume? (Multiple Choice - Multiple Selection Box)
- Camping cylinder [mini]
- Light cylinder (e.g.: *Pluma*, RepsolK11, Rubis Light)
- Butane cylinder [small]
- Propane cylinder [small]
- Propane cylinder [large]

13. For what purposes do you use gas cylinders? (Multiple Choice - Multiple Selection Box)
- Water heater
- Stove
- Oven
- Portable heater
- Grill
- Boiler
- Outdoor Heater
- Other: _____

14. What is your approximate monthly consumption in number of cylinders: (Multiple Choice - Multiple Selection Box & Text Entry)
- Camping cylinder [mini]: _____
- Light cylinder (e.g.: *Pluma*, RepsolK11, Rubis Light): _____
- Butane cylinder [small]: _____
- Propane cylinder [small]: _____
- Propane cylinder [large]: _____

PART III – BIO GAS

In the bottled gas market, the possibility of introducing an alternative energy to conventional bottled gas, called Bio LPG, is currently being evaluated. Bottled Bio Gas and traditional bottled Gas are the same product, with Bio Gas being produced from more environmentally friendly energy sources. This energy does not entail any switching costs and it is a product with the same calorific power as bottled gas. Bio Gas would be mixed in the gas cylinders, according to a stipulated percentage.

15. Have you heard of this product? (Multiple Choice - Single Answer)

A. Yes
B. No

16. What interest does this product have for you, on a scale of 0 to 10, taking into account the fact that it is more environmentally friendly / sustainable than traditional gas? Scale from 0 = no interest to 10 = a lot of interest (NPS)

Appendix 21: Quantitative Survey Script – Bottled LPG Target (IV/VIII)

17. What is your predisposition, on a scale of 0 to 10, to start buying a cylinder with Bio Gas instead of the traditional gas at your usual brand? Scale from 0 = nothing predisposed to 10 = very predisposed (NPS)
18. How predisposed would you be, on a scale of 0 to 10, to change your gas brand in order to consume Bio Gas if it were only available in a brand other than yours? Scale from 0 = nothing predisposed to 10 = very predisposed (NPS)
19. What is the impact on the brand image for you if it has the option of Bio Gas in its gas cylinders:
19.1. If it is [interviewee's usual brand]? [It gets worse, it gets better, it looks the same]
19.2. What if it was Galp? [It gets worse, it gets better, it looks the same]
19.3. What if it was Repsol? [It gets worse, it gets better, it looks the same]
19.4. What if it was Rubis Gás? [It gets worse, it gets better, it looks the same]
20. If there is an increase in the associated price, how predisposed would you be, on a scale of 0 to 10, to pay more for this product in your usual brand: Scale of 0 = not at all predisposed to 10 = very predisposed (NPS)
If Q12 = B / C / D [Exclusive to small cylinders]
20.1. If it is more €2? [0 - 10]
20.2. If it is more €1? [0 - 10]
20.3. If it is more €0.5? [0 - 10]
21. If there is an increase in the associated price, how willing would you be, on a scale of 0 to 10, to pay more for this product in your usual brand: Scale of 0 = not at all predisposed to 10 = very predisposed (NPS)
If Q12 = E [Exclusive to large cylinders]
21.1. If it is more 4€? [0 - 10]
21.2. If it is more €2? [0 - 10]
21.3. If it is more €1? [0 - 10]
22. Each cylinder will contain a certain percentage of Bio Gas incorporated. How willing, on a scale of 0 to 10, to buy the product in your usual brand: Scale of 0 = not at all predisposed to 10 = very predisposed (NPS)
22.1. If the incorporation is 5% of Bio Gas in your cylinder? [0 - 10]
22.2. What if the incorporation is 10%? [0 - 10]
22.3. What if the incorporation is 20%? [0 - 10]
23. What is your propensity to purchase the product in your usual brand, on a scale of 0 to 10, if: Scale from 0 = nothing predisposed to 10 = very predisposed (NPS)
If Q11 = B / C / D [Exclusive to small cylinder consumers]
23.1. The product has 5% Bio Gas and has a cost of €0.5 more than the conventional bottled Gas? [0 to 10]
23.2. The product has 10% Bio Gas and has a cost of €1 more than the conventional bottled Gas? [0 to 10]
23.3. The product has 20% Bio Gas and has a cost of €2 more than the conventional bottled Gas? [0 to 10]
24. What is your propensity, on a scale of 0 to 10, to purchase the new product, in your usual brand, if: Scale of 0 = nothing predisposed to 10 = very predisposed (NPS)
If Q11 = E [Exclusive to consumers of large cylinders]
24.1. The product has 5% Bio Gas and costs € 1 more than the conventional bottled Gas? [0 - 10]
24.2. The product has 10% Bio Gas and costs €2 more than the conventional bottled Gas? [0 - 10]
24.3. The product has 20% Bio Gas and costs €4 more than the conventional bottled Gas? [0 - 10]

Appendix 21: Quantitative Survey Script – Bottled LPG Target (V/VIII)

25. Which of these previous options would you choose to consume? (Multiple Choice - Single Answer)
If Q11 = B / C / D [Exclusive to small cylinder consumers]

- Product with 5% Bio Gas and a cost €0.5 higher than the conventional bottled Gas;
- Product with 10% Bio Gas and a cost of €1 higher than the conventional bottled Gas;
- Product with 20% Bio Gas and a cost of €2 higher than the conventional bottled Gas.

25.1. How predisposed, on a scale of 0 to 10, would you be to consume the product in your usual brand? Scale from 0 = nothing predisposed to 10 = very predisposed (NPS)
25.2. What if the brand is Galp? [0 to 10]
25.3. What if the brand is Repsol? [0 to 10]
25.4. What if the brand is Rubis Gás? [0 to 10]
26. Which of these previous options would you choose to consume? (Multiple Choice - Single Answer)
If Q11 = E [Exclusive to consumers of large cylinders]

- Product with 5% Bio Gas and a cost of €1 more than the conventional bottled Gas;
- Product with 10% Bio Gas and a cost of €2 more than the conventional bottled Gas;
- Product with 20% Bio Gas and a cost of €4 more than the conventional bottled Gas.

26.1. How predisposed, on a scale of 0 to 10, would you be to consume the product in your usual brand? Scale from 0 = nothing predisposed to 10 = very predisposed (NPS)
26.2. What if the brand is Galp? [0 to 10]
26.3. What if the brand is Repsol? [0 to 10]
26.4. What if the brand is Rubis Gás? [0 to 10]
27. Imagine that another brand starts offering Bio Gas at the same price that you already pay for conventional Gas, and that your usual brand does not offer this product. How predisposed would you be to change brands, on a scale of 0 to 10? Scale from 0 = nothing predisposed to 10 = very predisposed (NPS)

PART IV – ADDITIONAL SERVICES

28. What are the three aspects that you most value in the service provided by the bottled gas brand at the point of sale? And the three aspects that you most value in home delivery? (Multiple Choice - Multiple Selection Box)

POINT OF SALE

A. Cleanliness of the cylinders	**B. Proximity to the point of sale**
C. Characteristics of the cylinders	D. Cylinder gas brand promotions
E. Point of sale opening hours	F. Price of the cylinder
G. Technical advice	H. Means of payment available
I. Friendliness of service	J. Speed of the service
K. Brand confidence	L. Trust in the distributor

Appendix 21: Quantitative Survey Script – Bottled LPG Target (VI/VIII)

HOME DELIVERY

N. Condition of the cylinders

O. Cleanliness the cylinders

P. Characteristics of the cylinders

Q. Cylinder gas brand promotions

R. Price of the cylinder

S. Payment methods available

T. Possibility to order and schedule online

U. Technical assistance

V. Trust in the distributor

W. Brand confidence

X. Friendliness of the delivery person

Y. Speed of delivery

Z. Delivery time

AA. Easy to schedule the delivery

BB. Punctuality of the delivery

29. Order the following additional services offered, starting with the one you prefer the most to the one you prefer the least: [Sort]

A. Online payment in home delivery: Possibility to make the payment through the website or the application on the mobile phone, regardless of the form of purchase (address or point of sale)
B. Online deposit document: Possibility of online access to the cylinder deposit certificate
C. Online access to stock availability at points of sale: Possibility of online access to the number and type of cylinders available at each point of sale
D. Click & collect: Possibility of online purchase and collection at the selected point of sale
E. After-hours: Possibility to purchase and collect cylinders after hours in automatic lockers outside stores or points of sale

30. What would be your predisposition, on a scale of 0 to 10, for joining online payment? Scale from 0 = nothing predisposed to 10 = very predisposed (NPS)
30.1. If Q28 = 8/9/10- How predisposed would you be, on a scale of 0 to 10, to change vendors to have this service? [0 to 10] (NPS)
31. What would your predisposition be, on a scale of 0 to 10, for joining the online deposit guarantee? Scale from 0 = nothing predisposed to 10 = very predisposed (NPS)
31.1. If Q28 = 8/9/10 - How predisposed would you be, on a scale of 0 to 10, to change vendors to have this service? [0 to 10] (NPS)

32. What would be your predisposition, on a scale of 0 to 10, for subscribing to online availability of stock availability at points of sale? Scale from 0 = nothing predisposed to 10 = very predisposed (NPS)
32.1. If Q28 = 8/9/10 - How predisposed would you be, on a scale of 0 to 10, to change vendors to have this service? [0 to 10] (NPS)
33. What would be your predisposition, on a scale of 0 to 10, for joining the click and collect service? Scale from 0 = nothing predisposed to 10 = very predisposed (NPS)
33.1. If Q28 = 8/9/10 - How predisposed would you be, on a scale of 0 to 10, to change vendors to have this service? [0 to 10] (NPS)
34. How often have you felt the need to buy cylinders of gas at night or outside the opening hours of the usual place of purchase? (Multiple Choice - Single Answer)

- Often
- Occasionally
- Rarely
- Never

Appendix 21: Quantitative Survey Script – Bottled LPG Target (VII/VIII)

35. What would be your predisposition, on a scale of 0 to 10, for joining the after-hours service? Scale from 0 = nothing predisposed to 10 = very predisposed (NPS)
35.1. If Q28 = 8/9/10 - How predisposed would you be, on a scale of 0 to 10, to change vendors to have this service? [0 to 10] (NPS)

PART V – *MUNDO VERDE*

Imagining that your brand has an application called *Mundo Verde*. This application would be an extra complement where the consumer could earn points, called "green coins", according to the carbon emissions saved in their consumption, which can then be converted into discounts on products and services or donated to social and environmental projects.

36. What would be your interest, on a scale of 0 to 10, in relation to the possibility of quantifying the emission savings resulting from the consumption of Bio Gas? Scale from 0 = would not value to 10 = would greatly value (NPS)

37. And if your carbon emission savings generated could be converted into points, called green coins, that could be used for discounts and donations, what would be, on a scale of 0 to 10, your predisposition to join? Scale from 0 = nothing predisposed to 10 = very predisposed (NPS)
38. In which Gas products and services, would you consider discounting your points? (Multiple Choice - Multiple Selection Box)

- Bottled gas
- Auto LPG
- Bulk gas (Deposit)
- Grills
- Indoor heaters
- Outdoor heaters
- Boilers
- Water heaters
- Gas hobs
- Technical assistance
- Others: _____

39. How predisposed would you be, on a scale of 0 to 10, to discount your green coins on gas products or services referred to in the previous question? Scale from 0 = nothing predisposed to 10 = very predisposed (NPS)
40. How predisposed would you be, on a scale of 0 to 10, to donate green coins to projects that aim to reduce the environmental impact in developing countries (instead of discounting them on gas products or services)? Scale from 0 = nothing predisposed to 10 = very predisposed (NPS)

Appendix 21: Quantitative Survey Script – Bottled LPG Target (VIII/VIII)

41. In view of all the features of the "*Mundo Verde*" application, on a scale of 0 to 10, what would be your predisposition for using this application? Scale from 0 = nothing predisposed to 10 = very predisposed (NPS)

PART VI – POINTS OF SALE

42. Which of the following points of sale do you use most regularly? (Multiple Choice - Multiple Selection Box)
- Fuel station
- Specialized brand dealer
- Grocery / Minimarkets
- Super & Hypermarkets
- Cafés / Pastries
- Appliance stores
- Other: _____

43. How satisfied are you with the number of current bottled gas outlets on a scale of 0 to 10? Scale from 0 = not at all satisfied to 10 = very satisfied (NPS)

44. How useful would you consider the distribution of bottled gas in building materials and DIY stores, on a scale of 0 to 10? Scale from 0 = nothing predisposed to 10 = very predispose (NPS)

PART VII – DESCRIPTION

45. Age (Multiple Choice - Single Answer)
- [18; 25]
- [26; 40]
- [41; 55]
- [56; 70]
- More than 70

46. Gender (Multiple Choice - Single Answer)
- Female
- Male
- I prefer not to answer
- Other

47. District of residence (Multiple Choice - Dropdown List)

48. Place of residence: (Multiple Choice - Single Answer)
- City
- Village
- Countryside
- Other

49. Type of housing (Multiple Choice - Single answer)
- Apartment
- Housing

50. Including yourself in the count, indicate the number of people in your household: (Multiple Choice - Single answer)
- 1 individual
- 2 individuals
- 3 individuals
- 4 individuals
- 5 individuals
- More than 5 individuals

Thank you!

END

Appendix 22: Qualitative Analysis – Bottled LPG

Sustainability Concern Profile

10/16 VERY SUSTAINABLE

3/16 SUSTAINABLE

3/16 NOT SUSTAINABLE

Respondents show:

- **Great awareness** to the current environmental paradigm and a willingness to become **more sustainable**. The sample reveals concerns regarding **price, lack of supply and credibility**. Greater concerns with the **sustainability in the energy sector**.

Reasons to consume Bottled LPG

Multiple Choice	# Interviewees
Price	6/16
Only viable alternative	6/16
Calorific Power	5/16

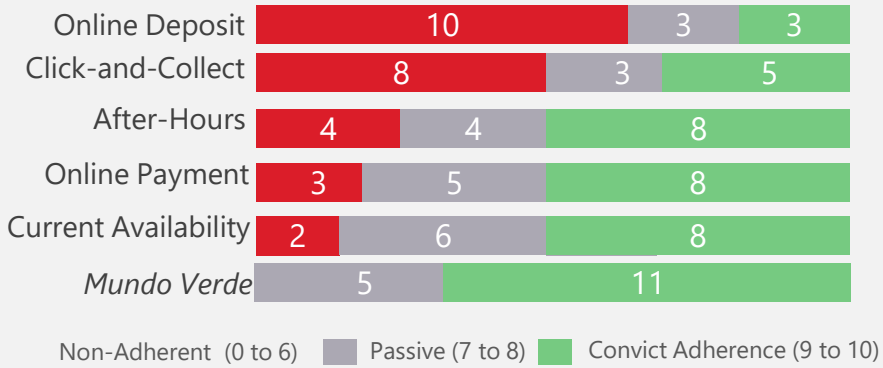
Factors in brand choice

- **Proximity**
- **Price**
- **Light cylinders**
- **Home delivery**

All respondents **are willing to switch to a more sustainable LPG.**

The main concerns regard the price or the performance of the product.

Additional Services Proposition Adherence



- 14 out of 16 of the respondents are **not willing to switch** provider to enjoy the services.

Construction Store Proposition Adherence

15/16 IRRELEVANT

Reasons:

- **Lack of proximity to stores.**
- **High satisfaction** with the currently available points of sale.

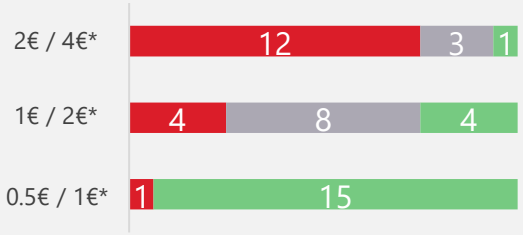
Source: Qualitative Interviews

Appendix 22: Qualitative Analysis – Bottled LPG

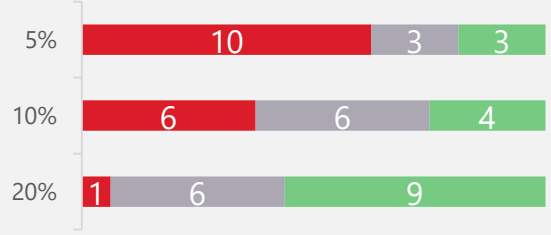
Bottled LPG

- The preferred choices reflect a more **price-driven** than sustainability-driven interviewee.

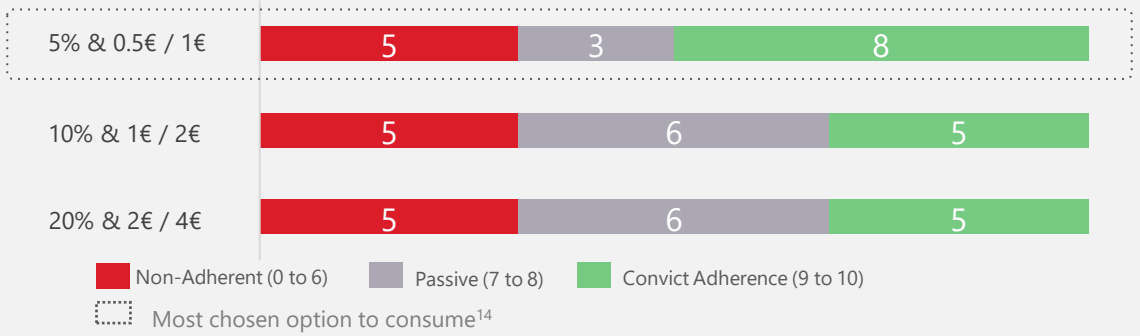
Price Increase Scenario



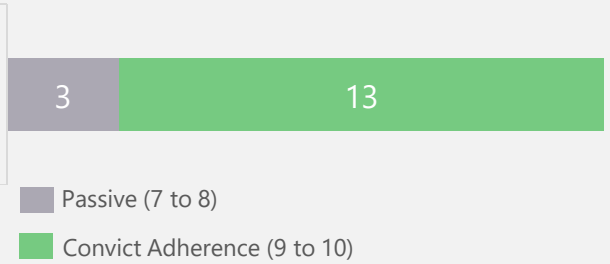
Incorporation Options



Preferred Incorporation / Price combination



Willingness to consume the preferred option in the current provider



Willingness to switch brands at the same price

	# Interviewees
Very much	7/16
Yes	3/16
Little	6/16

Reasons:

- Lack of proximity of other brands.
- Relationship with the reseller.
- Brand Loyalty.

Source: Qualitative Interviews

Appendix 22: Qualitative Analysis – Bottled LPG

"I consider as an advantage the sustainability. If the Bio (LPG) was introduced in a cylinder and it had the **same calorific power**, for us (consumers) it is the same, **if the price remains the same**."

Manuel, Gen. X

"I would prefer a product with a **higher incorporation because it is more sustainable**, **but the increase in price would have to be limited**"

Maria, Gen. Z

"I believe I would not change (provider), since the **resellers near me** are all Rubis Gás."

João, Gen. X

"I guess what attracts me more is the possibility of getting **discounts to use in the products**."

Ana, Millennial

Source: Qualitative Interviews

Appendix 23: Qualitative Interview Script – Auto LPG Target (I/IV)

INTRODUCTION

- Presentation of the interviewer and the project;
- Explanation of the interview procedures: informality; sincerity; importance of all opinions (there are no wrong answers);
- Authorization for audio recording.

PART 0 – CONSUMER PROFILE

Consumers' concern about the environment has been increasing, as we have all seen extreme phenomena in nature and many of us have been affected, either by rising sea levels or prolonged droughts. To combat this trend, several practices have been adopted, such as recycling, changing to LED lamps, turning off equipment when not in use or saving water from baths or flushing.

1. Do you usually separate your garbage daily?
2. In addition to recycling, what practices do you adopt to be environmentally friendly?
3. What are the reasons that lead you to adopt these habits?
4. Do you think these practices have a real impact on the environment?
5. What do you think could happen if measures are not taken to protect the environment?

PART I – SUSTAINABILITY

We are going to start our interview on the topic of sustainability.

6. In what products, services or companies do you remember the existence of environmentally friendly products or services?
7. Do you consume any of them?
7.1. If yes,
7.1.1. Which?
7.1.2. In that case, what is it that drives you to have these consumption habits?
7.1.3. Do you pay more for this type of product?
7.2. If not, why?
8. Do you intend to change consumption habits in the next year in order to be more environmentally friendly?
8.1. If not,
8.1.1. Why?
9. What is the importance of sustainability for you in the companies you choose to purchase products or services from?
10. In the specific case of the energy market, what is the importance of the existence of sustainable energies in the services you purchase / acquire?
11. What do you mean by Bio products?
11.1. And what products do you associate with this expression?
12. What do you mean by Sustainable products?
12.1. And what products do you associate with this expression?
13. What do you mean by Green products?
13.1. And what products do you associate with this expression?
14. Among the expressions Bio, Sustainable, and Green, which one do you consider to have the most positive environmental impact? Which do you prefer?
15. For you, what is the impact on the value of a brand when introducing a Sustainable / Green / Bio product?
16. How do you value a brand that communicates to the customer the environmental impact of the products it sells?

Appendix 23: Qualitative Interview Script – Auto LPG Target (II/IV)

PART II – CONTEXTUALIZATION
We will now focus on Auto LPG.

17. What do you consider the advantages of consuming Auto LPG?
18. Did you purchase a Auto LPG car of origin or convert your car?
18.1. What were the reasons that led you to choose this fuel?
19. What are the factors that led you to choose the Auto LPG brand?
20. Do you have any brand preference for Auto LPG?
21. What brand of Auto LPG do you consume regularly?
22. What is your monthly consumption of Auto LPG?
23. In addition to Auto LPG, do you use any other fuel?
23.1. If yes,
23.1.1. Which and why?
23.1.2. What is the monthly consumption of this fuel?
24. How satisfied are you with the current Auto LPG's points of sale?
24.1. Is there a location that you would like to see served with Auto LPG?
25. What do you consider to be the aspects to be improved in Auto LPG?
26. Have you ever thought about the environmental impact of consuming Auto LPG?
26.1. If yes,
26.1.1. Have you considered changing your car to a more sustainable alternative?
26.1.2. Which one?
26.2. If no, [proceed to question 26.3]
26.3. If you were to buy a new (or second hand) car now, would it be a LPG car?
26.3.1. Why?
27. If there existed a more sustainable version of Auto LPG, would you consider a possible change?
27.1. How predisposed would it be to change?

PART III – BIO LPG
We will now focus on Bio Auto LPG. In the Auto LPG market, the possibility of introducing an alternative energy to the conventional Auto LPG, called Bio Auto LPG, it is currently being evaluated. Bio Auto LPG and Auto LPG are the same product, with Bio Auto LPG being produced from sustainable energy sources. This energy does not entail any change costs, presenting the same performance as the conventional Auto LPG. Bio Auto LPG can be mixed in the existing Auto LPG network, according to a stipulated percentage, making the final product more sustainable, reducing carbon dioxide emissions.

28. Have you heard of this fuel?
28.1. If yes,
28.1.1. In what context and by what means?
28.2. If no, [go to question 29]
29. What advantages do you see in this fuel?
30. And do you have any concerns about this fuel?
30.1. If yes,
30.1.1. Which?
30.2. If no, [proceed to question 31]
31. Would you consider changing your supplier to consume this fuel if it was only available on a gas brand other than yours?

Appendix 23: Qualitative Interview Script – Auto LPG Target (III/IV)

32. How do you think the brand image will be affected by the product offering?
32.1. What if the Auto LPG brand is [interviewee's current supplier]?
32.2. What if the brand was Galp?
32.3. What if the brand was Repsol?
32.4. What if the brand was BP?
33. If there is an associated price increase, how much would you be willing to overpay for this product? If not, what would be the reason?
33.1. Would you be willing to pay more for this product:
33.1.1. If it costs more 3 cents per litre? [0 - 10]
33.1.2. What if it costs more 2 cents per litre? [0 - 10]
33.1.3. What if it costs more 1 cent per litre? [0 - 10]
34. What would be the percentage of Bio LPG that you think this product should have? Have you ever thought about it?
35. In relation to other sustainable products or energies, do you have any idea of the percentage of sustainable energy to be incorporated?
36. Would you be willing to purchase the product with a 5% incorporation of Bio LPG in the product? [0 - 10]
36.1. What if the incorporation is 10%? [0 - 10]
36.2. What if the incorporation is 20%? [0 - 10]
36.3. Do you find these incorporations satisfactory? Or would you value other options?
37. In general, would you value a cheaper product with less Bio LPG or more expensive with more Bio LPG?
38. What is the propensity to purchase the new product, on a scale of 0 to 10, if:
38.1. The product has 5% Bio LPG and costs more 1 cent per litre more than the conventional Auto LPG?
38.2. The product has 10% Bio LPG and costs 2 cents per litre more than the conventional Auto LPG?
38.3. The product has 20% Bio LPG and costs 3 cents per litre more than the conventional Auto LPG?
39. Which of these previous options would you choose to consume?
39.1. How predisposed, on a scale of 0 to 10, would you be to consume the product at your current brand?
39.2. What if the brand was Galp? [0 to 10]
39.3. What if the brand was Repsol? [0 to 10]
39.4. What if the brand was BP? [0 to 10]
39.5. Imagine that another brand starts offering Bio Auto LPG at the same price that you currently pay for the conventional Auto LPG, and that your regular brand does not offer this product. How willing would you be to change brands?

PART IV – ADDITIONAL SERVICES – *MUNDO VERDE*

We have just finished discussing the additional services. We will now discuss the proposal for a complement to the service provided. Imagining that your brand has an application, *Mundo Verde*, it would be an extra complement where the consumer could earn "green coins" according to the carbon emissions saved in their consumption, which can then be converted into discounts on products and services or donated to social and environmental projects.

40. Do you value the quantification of the environmental impact of your consumption, reflected in the saving of carbon emissions?

Appendix 23: Qualitative Interview Script – Auto LPG Target (IV/IV)

41. And if your carbon emission savings generated could be converted into points, called green coins, that could be used for discounts and donations, would your predisposition to join increase?
42. In which LPG products and services, would you consider discounting your points?
43. Would you consider donating green coins to projects that aim to reduce the environmental impact in developing countries?
43.1. Why?
44. What do you consider to be the advantages associated with this new application?
45. And do you identify any fears in using the application?
46. In view of all the features of the "*Mundo Verde*" application, on a scale of 0 to 10, what would be your predisposition for the use of this application?
47. What would be more attractive for you to include in the application?

PART V – INTEGRATED OFFER

Speaking now of models of integrated energy supply.

48. In your household, what type of energies do you use regularly?

DOMESTIC
- Electricity
- Natural gas
- LPG in cylinder
- Bulk LPG
- Piped LPG
- Solar energy (solar panels)

ROAD
- Fossil fuels
- Auto LPG
- Electric Charging

49. Of the energies you mentioned above, which are the suppliers who provided you with the service?
50. Have you subscribed to an integrated energy supply package?
50.1. If yes,
50.1.1. What are the energies included?
50.1.2. Which company supplies the package?
50.1.3. What are the reasons that lead you to subscribe to an integrated offer package?
50.2. If no,
51. Would you be interested in joining an integrated offer package with Bio Auto LPG?
52. Imagine that you could consume Bio Auto LPG during the month without making an immediate payment, by registering your consumption in the application of the brand, and then that amount will be charged at the end of the month on the invoice for the subscribed integrated offer package.
52.1. How interested would you be in this possibility?

We have now reached the end of our interview. Thank you for the availability.

Appendix 23: Quantitative Survey Script – Auto LPG Target (I/VI)

LANDING PAGE

Objective and context: This questionnaire was developed within the scope of the final Master's Project in Management of the Nova School of Business and Economics, with the objective of studying the preferences of Portuguese consumers in the bottled Gas market.
Anonymity: The information recorded throughout the questionnaire is anonymous and will not be analysed individually, but in an aggregate way.
Thank you very much for your availability.
The Project Team: Bruno Simplício, Madalena Louro, Maria Duarte, Pedro Horta.

Note: Throughout this questionnaire you will find the designation of electricity / gas and fuel supplier. The supplier is the entity with which it can directly contract these services (gas, electricity) or purchase the product (fuel) and with which it establishes a commercial relationship.

PART 0 – FILTERS

1. Do you consume bottled gas? (Multiple Choice - Single Answer)
A. Yes
B. No
If Q1 = B, [Finish]
2. How do you participate in the selection of bottled gas supplier? (Multiple Choice - Single Answer)
A. Decision maker
B. Influencer
C. I do not participate
If Q2 = C, [Finish]
3. In which sector of activity do you work? (Multiple Choice - Single Answer)
A. Banks / Insurance
B. Industry
C. Public administration
D. Agriculture
E. Market studies
F. Marketing
G. Energy
H. Pharmacies / Parapharmacies
I. Telecommunications
J. Other: _____
K. I have no active professional occupation
If Q3 = E, F, or G, [Finish]
4. At this moment, does anyone in your household work in a bottled gas or other energy supply company? (Multiple Choice - Single Answer)
A. Yes
B. No
If Q4 = A, [Finish]

Appendix 23: Quantitative Survey Script – Auto LPG Target (II/VI)

PART I – SUSTAINABILITY

5. Which of the following practices do you regularly adopt? (Multiple Choice Worsens- Multiple Selection Box)

- Recycling
- Changing to LED lamps
- Water saving methods
- Disconnect equipment when not in use
- Composting / Organic Waste
- Use of reusable or biodegradable bags (cardboard)
- Others: _____
- None

6. Select what factors you considered when adopting these practices: (Multiple Choice - Multiple Selection Box)

- Sustainability
- Savings
- Well-being
- Health
- Others: _____

7. What is the word you prefer to see associated with environmentally friendly products? (Multiple Choice - Single Answer)

- Bio
- Sustainable
- Green

8. When a brand has sustainable / environmentally friendly products, what impact does it have on the image of that brand? (Multiple Choice - Single Answer)

- Improves
- Stays the same

PART II – CONTEXTUALIZATION

8. Which of the following advantages do you consider relevant in the consumption of Auto LPG? (Multiple Choice - Multiple Selection Box)

- Price
- Sustainability
- Engine conservation
- Other: _____

9. Did you purchase an Auto LPG car of origin or convert it? (Multiple Choice - Single Answer)

- Car of origin
- I converted my car

10. What brand of Auto LPG do you regularly consume? (Multiple Choice - Single Answer)

- BP
- Cepsa
- Galp
- OZ
- Prio
- Repsol
- Auchan
- Other: _____

Appendix 23: Quantitative Survey Script – Auto LPG Target (III/VI)

11. What are the factors that led you to choose the Auto LPG brand? (Multiple Choice - Multiple Selection Box)
- Price
- Brand confidence
- Quality
- Proximity
- Brand recommended by family, friends or specialized professionals
- Discounts, Promotions and Partnerships
- Brand that was already a customer on other products or services
- Other: _____

12. What is your approximate monthly consumption of Auto LPG? (Multiple Choice - Single Answer)
- 0 to 25 litres
- 25 to 50 litres
- 50 to 75 litres
- 75 to 100 litres
- 100 to 150 litres
- 150 to 200 litres
- More than 200 litres

13. How satisfied are you, on a scale of 0 to 10, with the current Auto LPG points of sale? Scale from 0 = not at all satisfied to 10 = very satisfied (NPS)

14. If you were to buy a new (or second-hand) car now, would it be an Auto LPG car? (Multiple Choice - Single Answer)
- Yes
- No

PART III – BIO AUTO LPG

In the Auto LPG market, the possibility of introducing an alternative energy to the conventional Auto LPG, called Bio Auto LPG, is currently being evaluated. Bio Auto LPG and Auto LPG are the same product, with Bio Auto LPG being produced from sustainable energy sources. This energy does not entail any change costs, presenting the same performance as the conventional Auto LPG. Bio Auto LPG could be mixed in the existing Auto LPG network, according to a stipulated percentage, making the final product more sustainable by reducing carbon dioxide emissions.

15. Have you heard of this product? (Multiple Choice - Single Answer)
- Yes
- No

16. What interest does this product have for you, on a scale of 0 to 10, taking into account the fact that it is more environmentally friendly / sustainable than the conventional Auto LPG? Scale from 0 = no interest to 10 = a lot of interest

17. What is your biggest fear associated with the product? (Multiple Choice - Single Answer)
- Loss of engine performance
- Loss of fuel quality
- Credibility of the product
- Other: _____
- None

18. What is your predisposition, on a scale of 0 to 10, to start buying Bio Auto LPG instead of the conventional Auto LPG in your regular brand? Scale from 0 = nothing predisposed to 10 = very predisposed (NPS)

Appendix 23: Quantitative Survey Script – Auto LPG Target (IV/VI)

19. How predisposed would you be, on a scale of 0 to 10, to change the brand of Auto LPG, in order to consume Bio Auto LPG if it were only available in a brand other than yours? Scale from 0 = nothing predisposed to 10 = very predisposed (NPS)
20. What do you consider to be the impact on the brand image of a company if it introduces the option of Bio Auto LPG? Scale: [Worsens, improves, stays the same]
20.1. If it is your usual brand? [It gets worse, it gets better, it looks the same]
20.2. What if it is Galp? [It gets worse, it gets better, it looks the same]
20.3. What if it is Repsol? [Worsens, improves, stays the same]
20.4. What if it is BP? [Worsens, improves, stays the same]
21. If there is an increase in the associated price, how willing would you be, on a scale of 0 to 10, to pay more for this product in your usual brand:
Scale of 0 = not at all predisposed to 10 = very predisposed (NPS)
21.1. If it costs more 3 cents per litre? [0 - 10]
21.2. If it costs more 2 cents per litre? [0 - 10]
21.3. If it costs more 1 cent per litre? [0 - 10]
22. Auto LPG will contain a certain percentage of Bio LPG incorporated into the brand's network. How willing would you be, on a scale of 0 to 10, to purchase this product in your usual brand:
Scale of 0 = not at all predisposed to 10 = very predisposed (NPS)
22.1. If the incorporation is 5% Bio LPG? [0 - 10]
22.2. If the incorporation is 10% of Bio LPG? [0 - 10]
22.3. If the incorporation is 20% of Bio LPG? [0 - 10]
23. What is your propensity to purchase the product in your usual brand, on a scale of 0 to 10, if: Scale from 0 = nothing predisposed to 10 = very predisposed (NPS)
23.1. The product contains 5% Bio LPG and has a cost of 1 cent per litre higher than the conventional Auto LPG? [0 - 10]
23.2. The product contains 10% Bio LPG and has a cost of 2 cents per litre higher than the conventional Auto LPG? [0 - 10]
23.3. The product contains 20% Bio LPG and has a cost of 3 cents per litre higher than the conventional Auto LPG? [0 - 10]
24. Which of these previous options would you choose to consume? (Multiple Choice - Single Answer)

- Product with 5% Bio LPG and a cost of 1 cent per litre higher
- Product with 10% Bio LPG and a cost of 2 cents per litre higher
- Product with 20% Bio LPG and a cost of 3 cents per litre higher

24.1. How predisposed, on a scale of 0 to 10, would you be consuming the product:
Scale of 0 = nothing predisposed to 10 = very predisposed (NPS)
24.1.1. In your [consumer's usual brand]? [0 - 10]
24.1.2. What if the brand is Galp? [0 - 10]
24.1.3. What if the brand is Repsol? [0 - 10]
24.1.4. What if the brand is BP? [0 - 10]
25. Imagine that another brand starts offering Bio Auto LPG at the same price that you currently pay for the conventional Auto LPG, and that your brand does not offer Bio LPG. How predisposed would you be, on a scale of 0 to 10, to change brands?
Scale from 0 = nothing predisposed to 10 = very predisposed (NPS)

Appendix 23: Quantitative Survey Script – Auto LPG Target (V/VI)

PART IV – *MUNDO VERDE*

Imagining that your brand has an application called *Mundo Verde*. This application would be an extra complement where the consumer could earn points, called "green coins", according to the carbon emissions saved in their consumption, which can then be converted into discounts on products and services or donated to social and environmental projects.

26. What would be your interest, on a scale of 0 to 10, in relation to the possibility of quantifying the emission savings resulting from the consumption of Bio Gas? Scale from 0 = would not value to 10 = would greatly value (NPS)
27. And if your carbon emission savings generated could be converted into points, called green coins, that could be used for discounts and donations, what would be, on a scale of 0 to 10, your predisposition to join? Scale from 0 = nothing predisposed to 10 = very predisposed (NPS)
28. In which Gas products and services, would you consider discounting your points? (Multiple Choice - Multiple Selection Box)

- Bottled gas
- Auto LPG
- Bulk gas (Deposit)
- Grills
- Indoor heaters
- Outdoor heaters
- Boilers
- Water heaters
- Gas hobs
- Technical assistance
- Others: _____

29. How predisposed would you be, on a scale of 0 to 10, to discount your green coins on gas products or services referred to in the previous question? Scale from 0 = nothing predisposed to 10 = very predisposed (NPS)
30. How predisposed would you be, on a scale of 0 to 10, to donate green coins to projects that aim to reduce the environmental impact in developing countries (instead of discounting them on gas products or services)? Scale from 0 = nothing predisposed to 10 = very predisposed (NPS)
31. In view of all the features of the "*Mundo Verde*" application, on a scale of 0 to 10, what would be your predisposition for using this application? Scale from 0 = nothing predisposed to 10 = very predisposed (NPS)

Appendix 23: Quantitative Survey Script – Auto LPG Target (VI/VI)

31. In view of all the features of the "*Mundo Verde*" application, on a scale of 0 to 10, what would be your predisposition for using this application? Scale from 0 = nothing predisposed to 10 = very predisposed (NPS)

PART V – DESCRIPTION

32. Age (Multiple Choice - Single Answer)
- [18; 25]
- [26; 40]
- [41; 55]
- [56; 70]
- More than 70

33. Gender (Multiple Choice - Single Answer)
- Female
- Male
- I prefer not to answer
- Other

34. District of residence (Multiple Choice - Dropdown List)

35. Place of residence: (Multiple Choice - Single Answer)
- City
- Village
- Countryside
- Other

36. Including yourself in the count, indicate the number of people in your household: (Multiple Choice - Single answer)
- 1 individual
- 2 individuals
- 3 individuals
- 4 individuals
- 5 individuals
- More than 5 individuals

Thank you!

END

Appendix 24: Qualitative Analysis – Auto LPG

Sustainability Profile

3/5 SUSTAINABLE

2/5 NOT SUSTAINABLE

- Respondents show a **great awareness to the current environmental paradigm**.
- The most common reasons for adopting these practices is **for the environment** and also **economic savings.**
- The majority of the respondents consider to be **important the existence of sustainability in the energy sector**, as well as in another industries.

Auto LPG

Benefits in consuming Auto LPG

Multiple Choice	# Interviewees
Low Price	5/5
Sustainable	2/5
Good for engine maintenance	1/5

Factors in brand choice

- The **price** was the common decision factor.
- Respondents also mentioned additional factors as **proximity and quality of the fuel.**

All of them are willing to **try a more sustainable version of the fuel**, but the **price will be a determining factor**, as well as the impact on the engine.

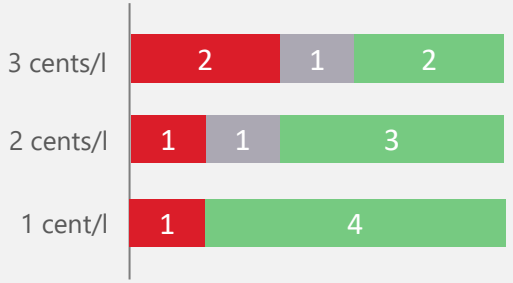
Source: Qualitative Interviews

Appendix 24: Qualitative Analysis – Auto LPG

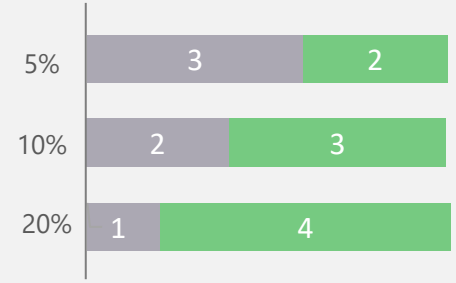
Auto Bio LPG

- All respondents consider that, regardless the brand, the **image will improve.**
- Respondents identified the **price as the key decision factor for changing the supplier.**

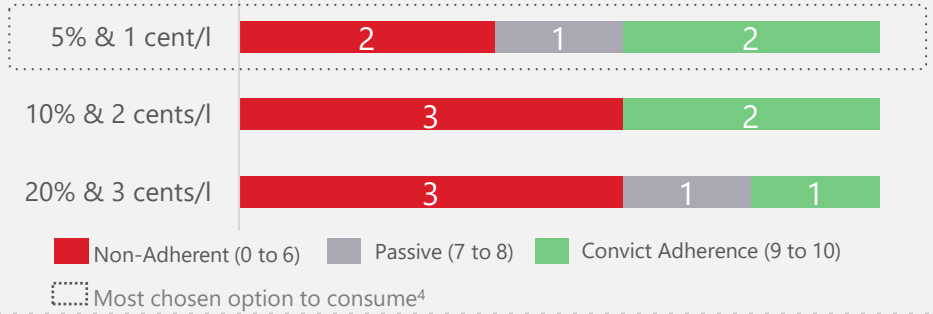
Price Increase Scenario



Incorporation Options Scenario



Preferred combination of incorporation & price



Auto Bio LPG

Willingness to change provider if another brand offered Auto Bio LPG at the same price of the conventional[5]

	# Interviewees
Very much	2/5
Yes	2/5
Little	1/5

Mundo Verde

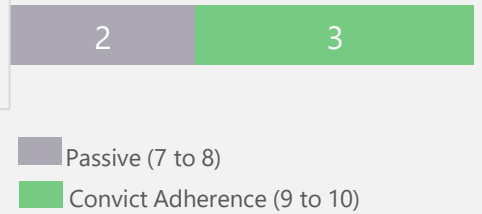
Discounts

4/5 **Greater** Disposition

Social and Ambiental Projects

3/5 **Certainty** Adherence

Application adherence levels



Source: Qualitative Interviews

Appendix 24: Qualitative Analysis – Auto LPG

"**Auto LPG in Spain**, has **more strength (power)** and it makes more kilometres when compared with the same amount of the Portuguese, because it is a **mixture of Butane and Propane. In Portugal, this does not happen**."

Manuel, Gen. X

"The brand is **not important**, if I try and it works, it is ok to change."

Joaquim, Baby Boomer

"I am not willing to change, due to **Galp's receipts for Continente**, which makes Auto LPG at Galp 7 cents per litre cheaper. Furthermore, I would not be willing to switch to Repsol, because I heard that the Auto LPG it sells causes **problems to the filters of the car**."

José, Gen. X

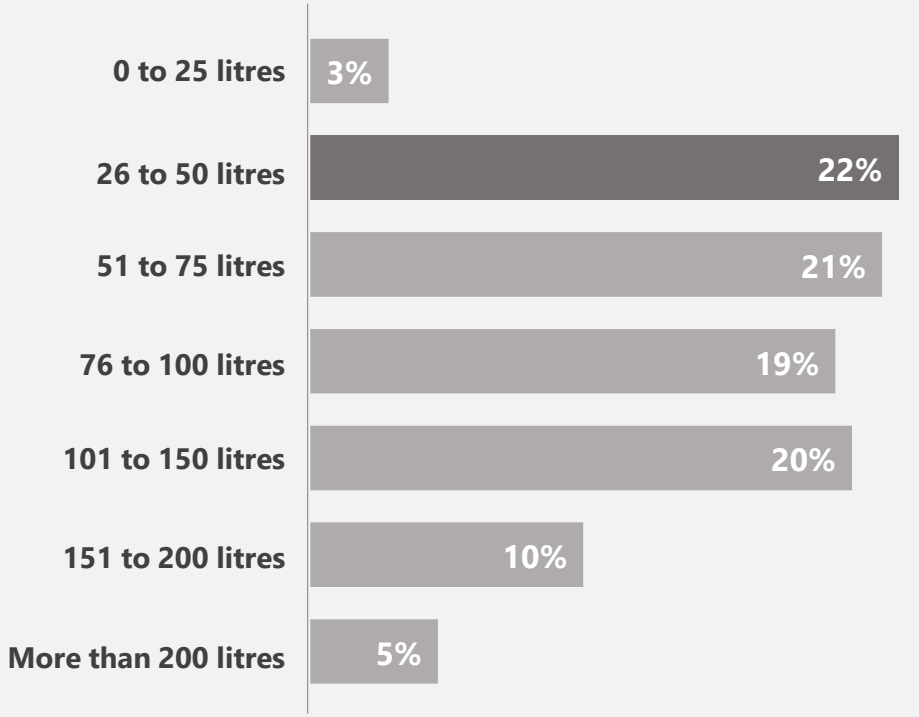
"There had to be a **minimum difference, 2 or 3 cents per liter**, and there has to be a **justification for the price increase**."

Afonso, Gen. X

Source: Qualitative Interviews

Appendix 25: Quantitative Analysis Auto LPG – Consumption and Services

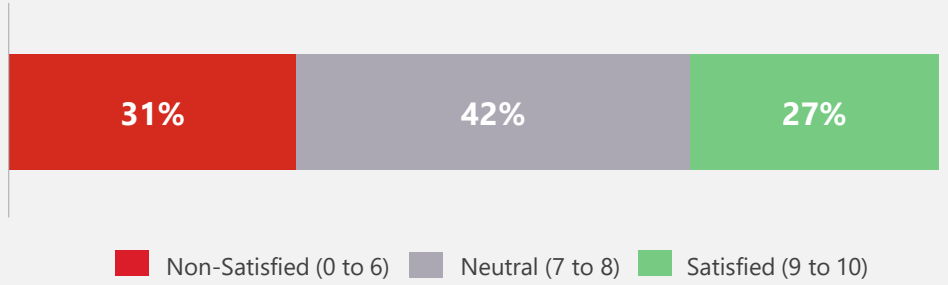
Monthly consumption



- The sample represents a **uniform distribution over the range of consumption**.

M.E: 7%[1]

Satisfaction with current points of sale



- Almost half of the interviewees (**42%**) have a **neutral satisfaction with the current distribution of the points of sale**.

M.E: 7%[1]

Source: Quantitative Questionnaire Auto LPG, Qualtrics, [1] SurveyMonkey (with a confidence level of 95%)

Appendix 26: Qualitative Interview Script – Bulk B2B LPG Target (I/III)

INTRODUCTION

- Presentation of the interviewer and the project;
- Explanation of the interview procedures: informality; sincerity; importance of all opinions (there are no wrong answers);
- Authorization for audio recording.

PART I – CONSUMER PROFILE

The concern of consumers in relation to the environment has been increasing, as well as that of companies, we have all observed extreme phenomena of nature and many of us have been affected, either by rising sea levels or by prolonged droughts. To combat this trend, several practices have been adopted, such as recycling, switching to LED lamps, turning off equipment when not in use or saving flushing the toilet.

1. Do you consider the role of companies to make consumers aware of more sustainable practices important?
2. In what products, services or companies do you remember the existence of a sustainable offer?
3. Do you consider sustainability in your business strategy?
3.1. If yes,
3.1.1. How?
3.2. If no,
3.2.1. Why?
3.2.2. [If sustainability is important] Do you intend to make your strategy more sustainable next year?
4. At [Company Name], do you consume any sustainable product or service?
4.1. If yes,
4.1.1. Which?
4.1.2. What advantages do you see in this consumption?
4.2. If no,
4.2.1. Why?
5. What is the importance of sustainability in the products and services used by the company?
6. In the specific case of the energy market, what is the importance of having sustainable products?
7. In the context of sustainability, what do you mean by Bio products?
7.1. And what products do you associate with this expression?
8. What do you mean by sustainable products?
8.1. And what products do you associate with this expression?
9. What do you mean by green products?
9.1. And what products do you associate with this expression?
10. Among the expressions Bio, Sustainable and Green, which one has the greatest environmental impact for you?
11. How do you think a brand's value perception varies with the introduction of a new [Sustainable / Green / Bio] product offering?
11.1. And in the case of [Company Name], do you think that the perception varies in the same way?
11.1.1. How do you think it would change consumer behaviour?
12. To what extent do you consider the communication of environmental impact by brands to be valued?
12.1. From the company's point of view, what is the best way to communicate to consumers the environmental impact of sustainable products?

Appendix 26: Qualitative Interview Script – Bulk B2B LPG Target (II/III)

PART II – CONTEXTUALIZATION
We will now focus on Bulk LPG.

13. What are the advantages of consuming bulk LPG?
14. What are the factors that led you to choose the brand of the LPG?
15. For what purposes is bulk LPG used?
16. What do you consider to be the aspects to improve in bulk LPG?
17. Have you ever considered the environmental impact of LPG consumption?
17.1. If yes,
17.1.1. Have you considered switching to an alternative energy source?
17.1.2. What alternative energies do you consider feasible for a possible change?
17.2. If no, [proceed to question 18]
18. If there was a more sustainable version of bulk LPG, would you consider a possible change?

PART III – BIO LPG
We will now focus on the Bio LPG. In the LPG market, it is being assessed the possibility of introducing an alternative energy to conventional gas, called Bio LPG. Bio LPG and conventional LPG are the same product, with Bio LPG being produced from more environmentally friendly energy sources. This energy does not entail any switching costs and it is a product with the same calorific power as conventional LPG. Bio LPG would be mixed in the LPG's tanks, according to a stipulated percentage.

19. Have you heard of this fuel?
19.1. If yes,
19.1.1. In what context and by what means?
19.2. If no, [go to question 29]
20. What advantages do you see in this fuel?
21. And do you have any concerns about this fuel?
21.1. If yes,
21.1.1. Which?
21.2. If no, [proceed to question 31]
22. Would you consider Bio LPG as a viable alternative energy source, [in addition to the sources you have already mentioned]?
23. What is your predisposition, on a scale of 0 to 10, to start buying Bio LPG instead of traditional gas?
24. Would you consider changing your supplier to consume this type of gas if it were only available on a gas brand other than yours?
25. How do you think the brand image will be affected by the product offering?
26. If there is an increase in the associated price, how much would you be willing to pay more to have this product? If you were NOT willing, what would be the reason?
26.1. What if it costs more 0.5%? [0 - 10]
26.2. What if it costs more 1%? [0 - 10]
26.3. What if it costs more 1.5%? [0 - 10]
27. What would be the percentage of Bio LPG that you think this product should have? Have you ever thought about it?
28. In relation to other sustainable products or energies, do you have any idea of the percentage of sustainable energy to be incorporated?

Appendix 26: Qualitative Interview Script – Bulk B2B LPG Target (III/III)

29. How predisposed, on a scale of 0 to 10, would you be purchasing the product with a 5% incorporation of Bio LPG in your reservoir? [0 - 10]
29.1. What if the incorporation is 10%? [0 - 10]
29.2. What if the incorporation is 20%? [0 - 10]
29.3. Do you find these incorporations satisfactory? Or would you value other options?
30. In general, would you value a cheaper product with less Bio LPG or more expensive with more Bio LPG?
31. What is the propensity to purchase the product, on a scale of 0 to 10, if:
31.1. The product has 5% Bio LPG and is 0.5% more expensive than the conventional LPG?
31.2. The product has 10% Bio LPG and is 1% more expensive than the conventional LPG?
31.3. The product has 20% Bio LPG and is 1.5% more expensive than the conventional LPG?
32 Which of these previous options would you choose to consume?
32.1. Imagine that another brand starts offering Bio LPG at the same price that your company already pays for the conventional LPG, and that Galp does not offer this product. How willing would you be to change brand?

PART IV – ADDITIONAL SERVICES

Let us now look at the additional services that can be provided by your bulk LPG's supplier.

33. Do you use any additional services regularly?
33.1. If yes,
33.1.1. Which one(s)?
33.1.2. [Q33.1.1. > 1] Which of these services do you value most?
33.2. If no,
33.2.1. Why?
34. Is there any aspect of the services already provided by Galp that you would like to see improved?
34.1. If yes,
34.1.1. Which one(s)?
35. Is there any other service that you would like to be provided?
36. How important is it for you to quantify the environmental impact resulting from your consumption option?
36.1. Would you be interested in having a certificate proving this impact?

Let's end with a question about partnerships.

37. If you already consume Bio LPG and your distributor asks you to share your experience with the product, would you like to be part of an explanatory video that illustrates your experience?
37.1. Do you consider that sharing your experience could have an impact on your brand?
37.2. Regarding consumers, do you think they would be influenced to consume more sustainable products?

We have now reached the end of our interview. Thank you for the availability.

Appendix 26: Quantitative Survey Script – Bulk B2B LPG Target (I/IV)

LANDING PAGE

Objective and context: This questionnaire was developed within the scope of the final Master's Project in Management of the Nova School of Business and Economics, with the objective of studying the preferences of Portuguese consumers in the bottled Gas market.

Anonymity: The information recorded throughout the questionnaire is anonymous and will not be analysed individually, but in an aggregate way.

Thank you very much for your availability.

The Project Team: Bruno Simplício, Madalena Louro, Maria Duarte, Pedro Horta.

Note: Throughout this questionnaire you will find the designation of electricity / gas and fuel supplier. The supplier is the entity with which it can directly contract these services (gas, electricity) or purchase the product (fuel) and with which it establishes a commercial relationship.

PART I – SUSTAINABILITY

1. Does your company adopt sustainable practices? (Multiple Choice - Single Answer)

- Yes
- No

2. If Q1 = A - Select what factors were taken into account when adopting sustainable practices in the company: (Multiple Choice - Multiple Selection Box)

- Sustainability / Environmental concerns
- Cost reduction
- Meet the carbon targets
- Tax incentives
- Others: _____

3. What is the word you prefer to see associated with environmentally friendly products? (Multiple Choice - Single Answer)

- Bio
- Sustainable
- Green

4. When a brand has sustainable / environmentally friendly products, what impact will it have on that brand's image? (Multiple Choice - Single Answer)

- Improves
- Stays the same
- Worsens

PART II – CONTEXTUALIZATION

5. Which of the following advantages do you consider to exist in the consumption of Gas (deposit)? (Multiple Choice - Multiple Selection Box)

- Only viable alternative
- Failure to pay fees in addition to the gas / energy consumed (You pay only for the product consumed without another associated tax)
- Cost / Price
- Calorific power
- Use of existing facilities
- Cooking on a gas stove
- Other: _____
- None

Appendix 26: Quantitative Survey Script – Bulk B2B LPG Target (II/IV)

6. What were the factors that led you to choose your Bulk Gas brand (deposit)? (Multiple Choice - Multiple Selection Box)
- Price
- Discounts
- Quality
- Proximity
- Brand confidence
- Brand recommended by technicians
- Brand that were already customers in other products or services
- Other: _____

7. For what purposes do you use Bulk Gas (deposit)? (Multiple Choice - Multiple Selection Box)
- Heavy machinery
- Space heating
- Water heating
- Kitchen
- Other: _____

8. How important, on a scale of 0 to 10, is the environmental impact of gas consumption to the company? Scale from 0 = not at all important to 10 = very importante (NPS)

PART III – BIO LPG

In the Gas market, the possibility of introducing an alternative energy to conventional gas, called Bio Gas, is currently being evaluated. Bio Gas and conventional Gas are the same product, with Bio Gas being produced from more sustainable energy sources. This energy does not entail any switching costs and has the same calorific value as conventional gas. Bio Gas would be mixed in conventional gas reservoirs, according to a stipulated percentage.

9. Do you already know this product? (Multiple Choice - Single Answer)
- Yes
- No

10. What interest does this product have for your company, on a scale of 0 to 10, taking into account the fact that it is more environmentally friendly / sustainable than conventional gas?
Scale from 0 = no interest to 10 = a lot of interest (NPS)

11. What is your company's predisposition, on a scale of 0 to 10, to start consuming Bio Gas instead of conventional Gas?
Scale from 0 = nothing predisposed to 10 = very predisposed (NPS)

12. How predisposed would you be, on a scale of 0 to 10, to change your gas brand in order to consume Bio Gas if it were only available in a brand other than yours?
Scale from 0 = nothing predisposed to 10 = very predisposed (NPS)

13. What is the impact on Galp's image for the company if it has the option of Bio Gas in its deposits? (Multiple Choice - Single Answer)
- Improves
- Stays the same
- Worsens

14. If there is an increase in the associated price, how willing would your company be, on a scale of 0 to 10, to pay more for this product:
Scale of 0 = not at all predisposed to 10 = very predisposed (NPS)

14.1. If it costs more 1.5%? [0 - 10]

14.2. If it costs more 1%? [0 - 10]

14.3. If it cost more 0.5%? [0 - 10]

Appendix 26: Quantitative Survey Script – Bulk B2B LPG Target (III/IV)

15. How predisposed, on a scale of 0 to 10, would your company be in purchasing the product: Scale of 0 = nothing predisposed to 10 = very predisposed (NPS)
15.1. If the incorporation is 5% of Bio Gas in your deposit? [0 - 10]
15.2. What if the incorporation is 10%? [0 - 10]
15.3. What if the incorporation is 20%? [0 - 10]
16. What is your company's propensity to purchase the product, on a scale of 0 to 10, if:
Scale of 0 = nothing predisposed to 10 = very predisposed (NPS)
16.1. The product contains 5% Bio Gas and costs 0.5% more than the conventional Gas? [0 - 10]
16.2. The product contains 10% Bio Gas and costs 1% more than the conventional Gas? [0 - 10]
16.3. The product contains 20% Bio Gas and costs 1.5% more than conventional Gas? [0 - 10]
17. Which of these previous options would you choose to consume?
(Multiple Choice - Multiple Selection Box)

- Product with 5% Bio Gas and 0.5% price increase
- Product with 10% Bio Gas and 1% price increase
- Product with 20% Bio Gas and 1.5% price increase

18. Imagine that another brand starts offering Bio Gas at the same price that you currently pay for conventional Gas, and that Galp does not offer this product. How predisposed, on a scale of 0 to 10, would you be changing supplier?
Scale from 0 = nothing predisposed to 10 = very predisposed (NPS)

PART IV – ADDITIONAL SERVICES

19. How satisfied are you, on a scale of 0 to 10, with the current service provided?
Scale from 0 = not at all satisfied to 10 = very satisfied (NPS)
20. How important is it for you, on a scale of 0 to 10, to quantify the environmental impact resulting from the energy consumption?
Scale from 0 = not at all important to 10 = very important (NPS)
21. How interested would your company be, on a scale of 0 to 10, in being provided a certificate proving this environmental impact?
Scale from 0 = not interested to 10 = very interested (NPS)

PART V – PARTNERSHIPS

Imagine that you decide to consume Bio Gas and your distributor asks you to share your experience with the product and its environmental impact.
22.1. How willing, on a scale of 0 to 10, would you be part of an explanatory video that illustrated Bio Gas as part of your sustainable strategy?
Scale from 0 = nothing predisposed to 10 = very predisposed (NPS)
22.2. What impact would it have on your customers, on a scale of 0 to 10, the fact that you use Bio Gas in your company?
Scale from 0 = not at all important to 10 = very important (NPS)
22.3. And in relation to consumers, what predisposition would they have, on a scale of 0 to 10, to consume your company's products because your company uses Bio Gas?
Scale from 0 = nothing predisposed to 10 = very predisposed (NPS)

Appendix 26: Quantitative Survey Script – Bulk B2B LPG Target (IV/IV)

PART VI – DESCRIPTION

23. Company name (Text Entry)
24. District where the company is located (Multiple Choice - Dropdown List)
25. Age of the respondent (Multiple Choice - Single Answer)
- [18; 25]
- [26; 40]
- [41; 55]
- [56; 70]
- More than 70

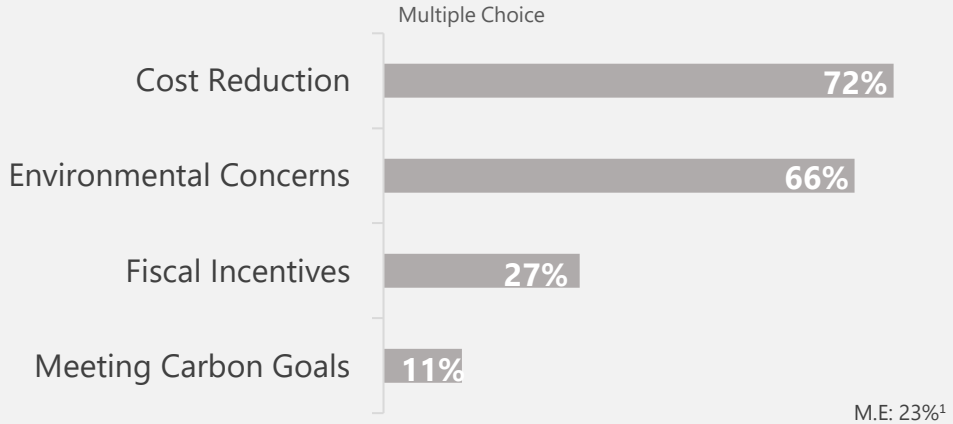
26. Gender of the respondent (Multiple Choice - Single Answer)
- Female
- Male
- I prefer not to answer
- Other

Thank you!

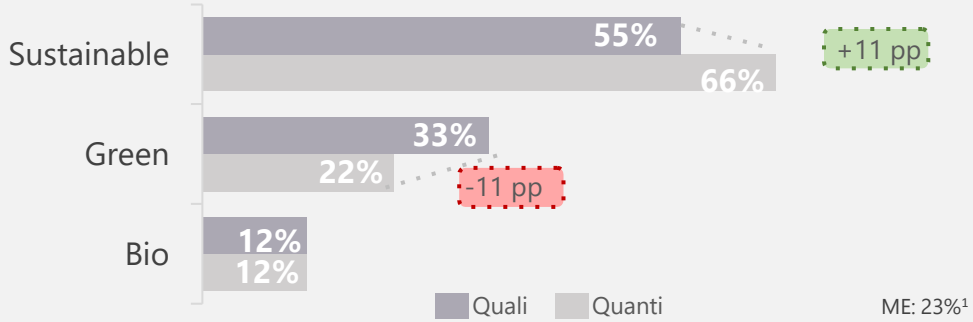
END

Appendix 27: Qualitative and Quantitative Analysis – Bulk B2B LPG

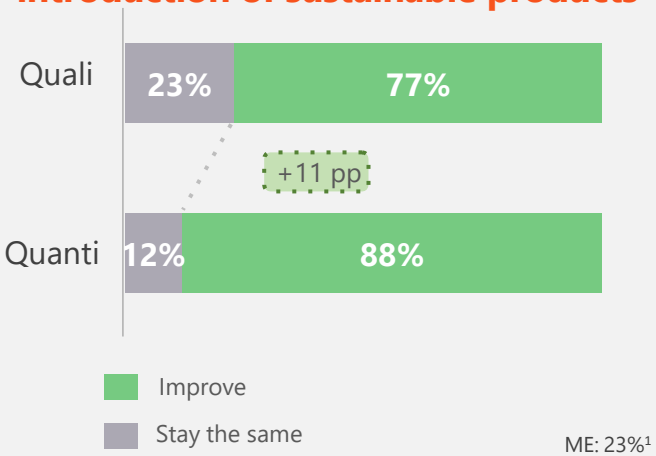
Reasons to adopt sustainable behaviours



Word perceived as more environmentally friendly



Impact on the brand's image with the introduction of sustainable products



Quali

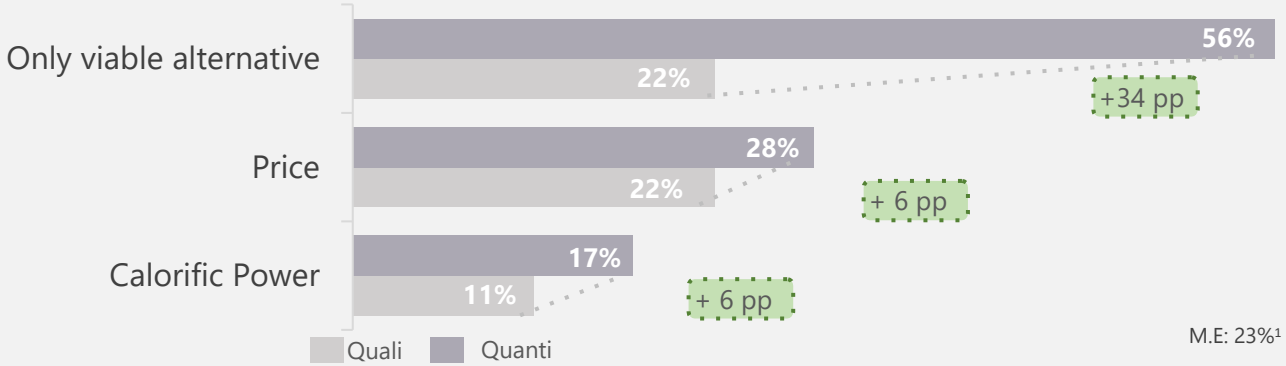
- Companies believe **consumer behaviour will be affected** with the **introduction of a sustainable product.**
- The majority of companies consider **important the existence of sustainable products on the energy market.**

Sources: Qualitative Interviews and Quantitative Questionnaire Bulk B2B LPG, Qualtrics; [1] SurveyMonkey (with a confidence level of 95%)

Appendix 27: Qualitative and Quantitative Analysis – Bulk B2B LPG

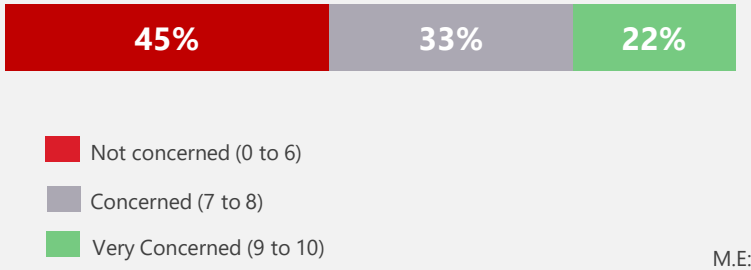
Main Decision Drivers

Multiple Choice



M.E: 23%[1]

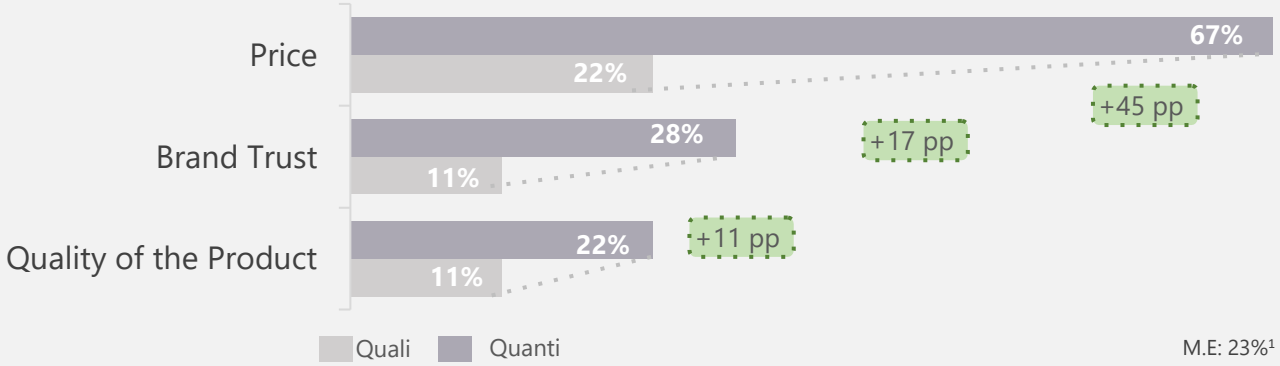
Concerns with environmental impact of the gas consumption



M.E: 23%[1]

Main Factors in brand choice

Multiple Choice



M.E: 23%[1]

- The percentage of companies which described the fact that LPG is the **only viable alternative as a decision driver** significantly increased from the qualitative to the quantitative analysis.
- **Price** was the most chosen factor in brand choice in the quantitative analysis.
- More than half of the companies are **concerned with the environmental impact of the gas consumption.**

Sources: Qualitative Interviews and Quantitative Questionnaire Bulk B2B LPG, Qualtrics; [1] SurveyMonkey (with a confidence level of 95%)

Appendix 27: Qualitative and Quantitative Analysis – Bulk B2B LPG

Previous knowledge about Bio LPG

M.E: 23%[1]

9/9 NO PREVIOUS KNOWLEDGE

44%	56%
PREVIOUS KNOWLEDGE	NO PREVIOUS KNOWLEDGE

Impact on Galp's image with the introduction of Bio LPG

7/9 IMPROVE

67%	33%
IMPROVE	STAY THE SAME

M.E: 23%[1]

Quali

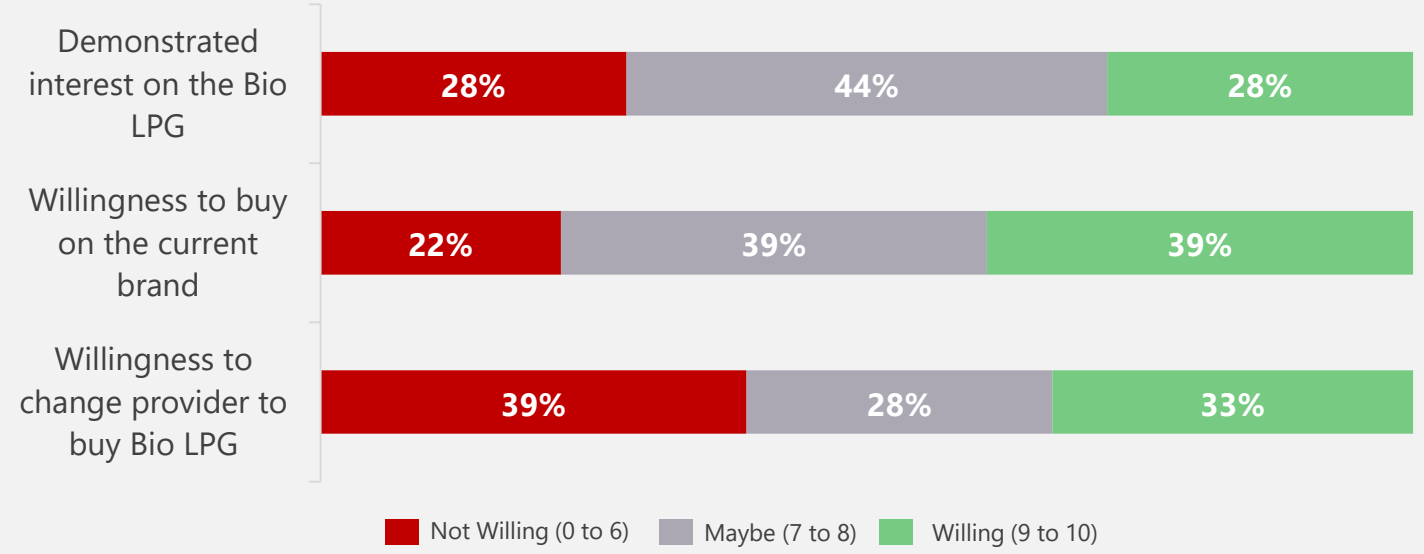
Desire to switch to a more sustainable LPG version

	# Interviewees
Yes	4/9
Depends on the price	4/9
No	1/9

Willingness to buy on the current brand

	# Interviewees
Yes	2/9
Depends on the price	4/9
Depends on the sustainability	1/9
No	2/9

Interest and predisposition to buy Bio LPG



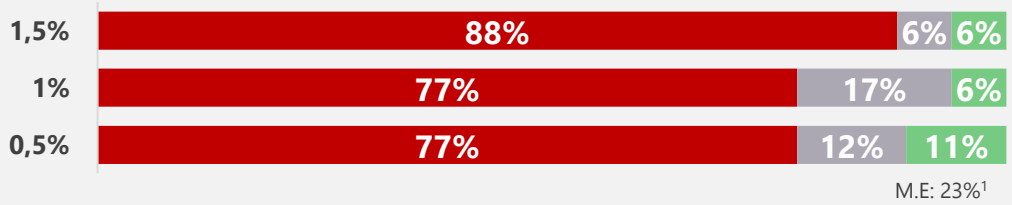
Quanti

M.E: 23%[1]

Sources: Qualitative Interviews and Quantitative Questionnaire Bulk B2B LPG, Qualtrics; [1] SurveyMonkey (with a confidence level of 95%)

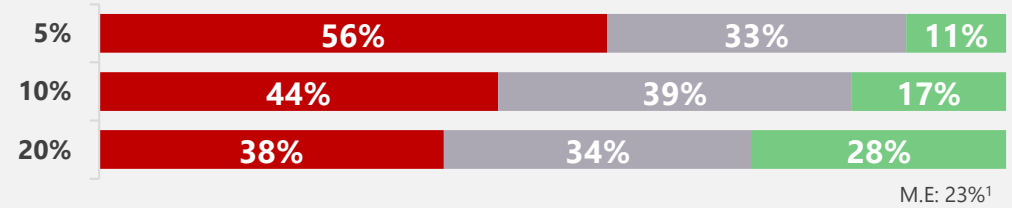
Appendix 27: Qualitative and Quantitative Analysis – Bulk B2B LPG

Price Increase Scenario



M.E: 23%[1]

Incorporation Options Adherence



M.E: 23%[1]

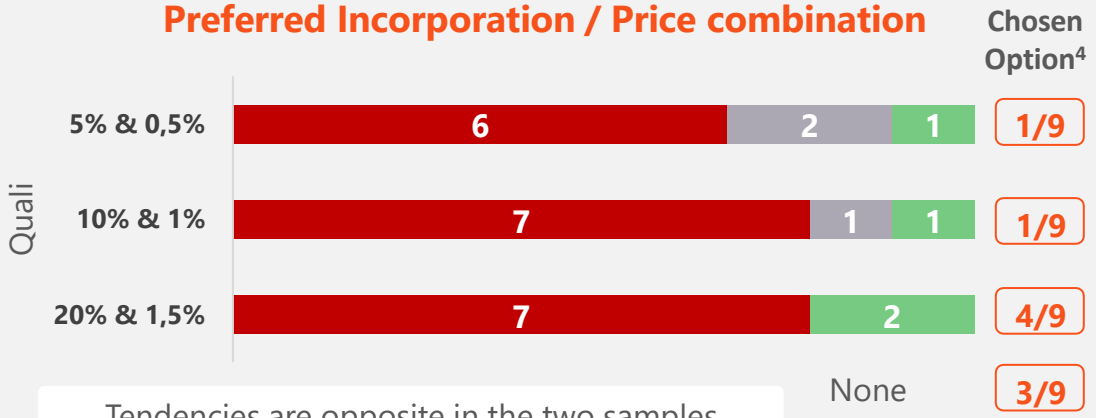
Non-Adherent (0 to 6) | Passive (7 to 8) | Convict Adherent (9 to 10)

Predisposition to change brand to consume Bio LPG at the same price

M.E: 23%[1]

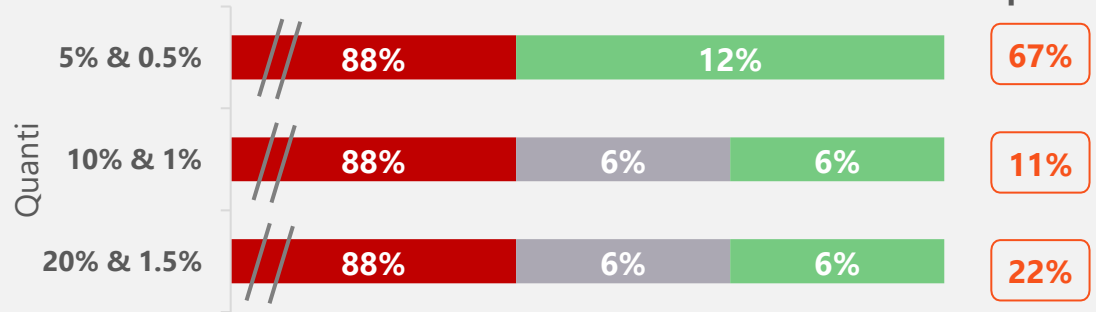
Non-Adherent (0 to 6) | Passive (7 to 8) | Convict Adherent (9 to 10)

Preferred Incorporation / Price combination



Tendencies are opposite in the two samples

Preferred Incorporation / Price combination



Non-Adherent (0 to 6) | Passive (7 to 8) | Convict Adherent (9 to 10)

M.E: 23%[1]

Sources: Qualitative Interviews and Quantitative Questionnaire Bulk B2B LPG, Qualtrics; [1] SurveyMonkey (with a confidence level of 95%)

Appendix 27: Qualitative and Quantitative Analysis – Bulk B2B LPG

Additional Services

Company perception whether Galp's additional services need to be improved

Quali

2/9 **YES**

Quali

7/9 **NO**

Areas of improvement mentioned by the clients:

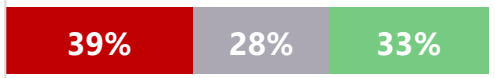
- Implementation of devices to measure **real-time gas consumption on the several points of the company; as well as to detect gas leaks.**

Importance of quantifying the environmental impact generated by energy consumption

Quali

7/9 of the interviewed companies consider important

Quanti



M.E: 23%[1]

Non-Interested (0 to 6) Neutral (7 to 8) Interested (9 to 10)

Willingness to receive a certificate that proves the environmental impact from the consumption

Quali

9/9 of the interviewed companies **would like to receive**

Quanti

M.E: 23%[1]

Not Willing (0 to 6) Maybe (7 to 8) Willing (9 to 10)

- Some companies consider being **relevant to quantify the environmental impact generated from their energy consumption options**, which was verified in both questionnaires.
- Then, they showed a **moderate willingness to receive a certificate** proving the impact caused by their sustainable consumption. However, in the qualitative, the willingness was higher than in the online surveys.

Sources: Qualitative Interviews and Quantitative Questionnaire Bulk B2B LPG, Qualtrics; [1] SurveyMonkey (with a confidence level of 95%)

Appendix 27: Qualitative and Quantitative Analysis – Bulk B2B LPG

Experience Sharing Impact

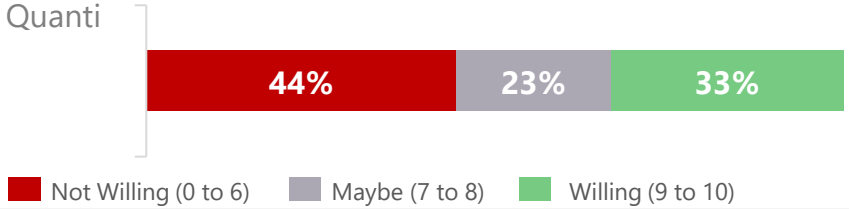
Willingness to share their experience with Bio LPG in a video as part of the sustainable strategy

Quali

7/9 AVAILABLE

2/9 NOT AVAILABLE

Quanti



ME: 23%[1]

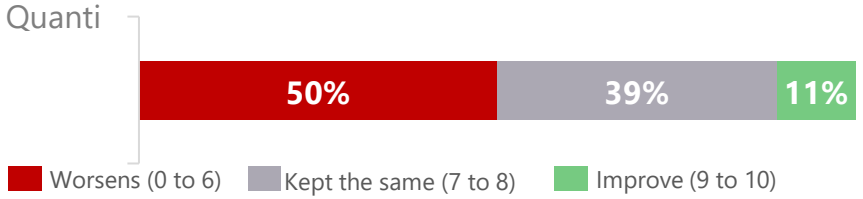
Perception of their clients about the company given the fact it is consuming Bio LPG

Quali

6/9 POSITIVELY

3/9 NEUTRAL

Quanti



ME: 23%[1]

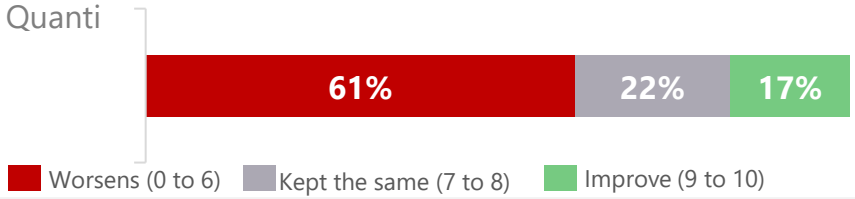
Willingness of the consumers to buy products of the company just because of being sustainable

Quali

7/9 POSITIVELY

2/9 NEUTRAL

Quanti



ME: 23%[1]

- A considerable number of companies would be **available and interested in participating in a video** sharing their experience with the consumption of Bio LPG.
- Half of the companies consider that with the consumption of Bio LPG in their businesses, the **client's perception about their company** improves or stays the same.
- The majority of the companies assume that the **adherence to consume more sustainable products from their clients would be negative**.

Sources: Qualitative Interviews and Quantitative Questionnaire Bulk B2B LPG, Qualtrics; [1] SurveyMonkey (with a confidence level of 95%)

Appendix 27: Qualitative and Quantitative Analysis – Bulk B2B LPG Quotes

"I would be willing to **pay up to 5% more to have Bio LPG**. I consider it to be an investment and I reckon the **increased brand perception** would generate enough sales over a year to compensate the price difference."

Company on the Hospitality Sector

"If the percentage of Bio LPG on the product is very small, I would not be able to promote the usage of the product, because using a product with such a **small percentage can be viewed as misleading advertising**."

Company on the Hospitality Sector

"I consider that having the opportunity to share my experience with the product on a video would **improve the brand image of the company**."

Company on the Agriculture and cattle raising Sector

"I would choose the option with 20% Bio LPG incorporation and a 1.5% price increase because when compared with the other two options, **it is the option with more Bio LPG as a proportion of the percentual price increase."**

Company on the Technology Sector

Sources: Qualitative Interviews and Quantitative Questionnaire Bulk B2B LPG, Qualtrics; [1] SurveyMonkey (with a confidence level of 95%)

Appendix 28: Hypothesis Testing Personas Validation

The personas from each target were validated by crossing different relevant variables, gathered in the quantitative and qualitative analysis. The following table shows the different criteria considered.

Targets	Personas	Validation Criteria
Bottled LPG	**Convenience Seekers**	▪ Main factors in brand choice is proximity. (Q11) ▪ Willing to pay more 0.50€. (Q20 / Q21) ▪ Convict-adherence to the additional services. (Q30 / Q31 / Q32/ Q33/ Q34/ Q35)
	Price Seekers	▪ Main factors in brand choice is price. (Q11) ▪ No willingness to pay the 0.50€ price increase. (Q20 / Q21) ▪ Preference to use green coins in purchasing products and services. (Q39 / Q40)
	Trust Seekers	▪ Main factors in brand choice is brand trust. (Q11) ▪ No willingness to change brands to consumer Bio LPG. (Q27)
	No Problem Seekers	▪ Main factor in brand choice is already having the reductor or the brand parents already used. (Q18) ▪ Willingness to change providers if it benefits the user. (Q42.2 / Q43.2 / Q44.2 / Q45.2 / Q47.2)
Auto LPG	**Price Seekers**	▪ Factor selected in brand choice is price. (Q11) ▪ No willingness to pay the 0.01€ price increase per litre. (Q21) ▪ Chosen option was with the lowest price increase of 0,01€ per litre and incorporation of Bio LPG. (Q24)
	Convenience Seekers	▪ Factor selected in brand choice is proximity. (Q11) ▪ Convict-adherence to pay 0.01€ price increase per litre. (Q21)
	Promotion Seekers	▪ Referred that the choice of the brand is driven by the discounts provided by the brand. (Q11) ▪ No willingness to pay the 0,01€ price increase per litre. (Q21) ▪ Convict-adherence to the use discounts in preferred products. (Q29)
Bulk B2B LPG	**Price Seekers**	▪ No willingness to pay 0.5% increase per tonne. (Q14) ▪ Willing to change the provider, when the price is equal to the conventional LPG. (Q18)
	Trust Seekers	▪ Factors selected in brand choice are Brand Trust and Product Quality. (Q6) ▪ No willingness to change the provider. (Q12, Q18)
	Brand Enhancement Seekers	▪ Consider to exist an improvement on Galp's image with the introduction of Bio LPG. (Q13) ▪ Willing to receive the certification of the sustainable consumption. (Q21)

Personas not validated in the Quantitative Analysis

Appendix 29: Financial Analysis of the 3 Projects

Projects	Local Production Recovery			LPR + New Production Unit			Import		
Time Horizon	**17 years**			**17 years**			**17 years**		
Local Production Recovery Investment	€ 3M			€ 3M			-		
New Production Unit Investment	-			€12M			-		
Mundo Verde Investment	€100k			€100k			€100k		
Total Initial Investment	€3.1M			€15.1M			€100k		
Period	2022	2023	2024 onwards	2022	2023	2024 onwards	2022	2023	2024 onwards
Bio LPG M&C Costs	€220k	€120k	€70k	€220k	€120k	€70k	€220k	€120k	€70k
Mundo Verde M&C Costs	€30k	€30k	€30k	€30k	€30k	€30k	€30k	€30k	€30k
Total Marketing & Communication Costs	**€250k**	**€150k**	**€100k**	**€250k**	**€150k**	**€100k**	**€250k**	**€150k**	**€100k**
Tax Rate	38%			38%			38%		
WACC	8.12%			8.12%			8.12%		

Note: For confidentiality reasons internal and supplied data by Galp was disguised with dummy values.

Appendix 29: Financial Analysis of the 3 Projects

Projects	**Local Production Recovery**	**LPR + New Production Unit**	**Import**
Local Production	2.4k tonnes*	2.4k tonnes*	-
Production from the new Unit	-	13k tonnes	-
Imported Quantities	-	-	15.4k tonnes
Total Quantity	2.4k tonnes	15.4k tonnes	15.4k tonnes
Auto LPG allocation	90%	~83%	~83%
Bottled LPG allocation – *Pluma*	5%	~12%	~12%
Bulk B2B allocation	5%	5%	5%
Auto LPG incorporation	~15%	87% (2022) – 70% (2038)**	87% (2022) – 70% (2038)**
Bottled LPG incorporation – *Pluma*	~1.9%	30%	30%
Bulk B2B incorporation	100%	100%	100%

Notes:
* 60% recovered from a total of 4k tonnes produced
** The values depend on the year and scenario considered
For confidentiality reasons internal and supplied data by Galp was disguised with dummy values.

Appendix 29: Variation of the key variables of the financial Analysis accordingly to each scenario

	Best Case	Base Case	Worst Case
Midstream Margin	€600	€450	€300
Import Cost	€200	€500	€800
Retention Factor - *Plumas*	75%	50%	25%
Mundo Verde Additional Retention Rate - *Plumas*	0.20%	0.15%	0.10%
New clients Acquisition Rate – *Plumas* & Auto LPG	75%	50%	25%
Mundo Verde Additional Acquisition Rate ▪ *Plumas* ▪ Auto LPG	 0.20% 0.25%	 0.15% 0.20%	 0.10% 0.15%
Incremental Margin Rate	2%	1%	0%

Note: For confidentiality reasons internal and supplied data by Galp was disguised with dummy values.

Appendix 30: External Factors - Carbon Credits Market

Market Prices

- The European Union has **toughened its climate targets**, which has caused prices to increase.[1]
- In April 2021, **EU Carbon Price hit a record high above 45€ per tonne**.[1]
- The latest rally in Carbon prices has concerned the European Union that it **will hurt the competitiveness of the bloc's industries.**[2]

Market Quantity Demanded

- **Demand for Carbon credits** is expected to **increase by a factor of 15 or more by 2030 and by a factor of up to 100 by 2050**.[3]
- The market for carbon credits can be **worth more than $50 billion in 2030**.[3]

Main Market Challenges

- **Limited price data available** makes it harder for buyers to know whether they are paying a fair price and for suppliers to know whether the investment on the project will pay off.[3]
- **Difficulty to attract financing to projects** due to the time spent between the investment and the sale of the credits.[3]

Sources: [1]Reuters; [2]Bloomberg; [3]McKinsey; [4]Eco Sapo

Carbon Credits in the Energy Market

galp Bio LPG Carbon Savings:

2.7 tonnes of CO_2 / tonne of Bio LPG

The production of Bio LPG will allow Galp to save 2.7 tonnes of CO_2 per each tonne of Bio LPG produced.

bp Acquisition of Carbon Credits:

- To compensate the total CO_2 emissions resulting from the consumption of its clients in Portugal, in 2020 **BP purchased Carbon Credits for two million tonnes of CO_2.**[4]
- The purchased Carbon Credits come from projects including one to **buy efficient stoves in Mexico** and another of **forest preservation in Zambia.**[4]

Appendix 30: External Factors - Fiscal Incentives for B2B

EU ETS covers specific sectors and gases, namely:

- **CO_2 from energy-intensive industry sectors,** including:
  - oil refineries;
  - steel works and production of iron, aluminium, metals, cement, lime, glass, ceramics, pulp, paper, cardboard, acids and bulk organic chemicals[1].

Increased the cost of carbon-intensive inputs and processes.

However, the carbon price encourages to:

Switch to lower-carbon production processes and to **invest in carbon-intensity reduction Technologies.**

Comply with additional internal policies that affect the stakeholders of the industry.

Example of a potential B2B client for the Bio LPG…

Leader in Portugal in the production and commercialization of **cement**.

Cimpor's Sustainability Strategy:

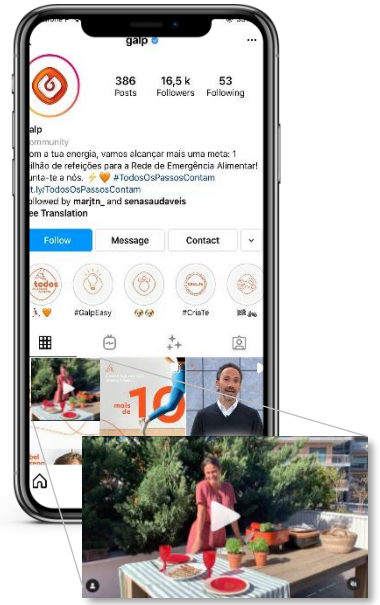
- Reduce the **CO_2 emissions by 37% by 2030;**
- **Achieve Carbon neutrality in 2050[2].**

Sources: [1] EC Europe; [2] Cimpor

Appendix 31: Implementation Plan – Online campaign: Social Media

1 **ONLINE CAMPAIGN**

Social Media



Target | Galp clients / New clients

Goals

- Communicate the new **value proposition**.
- Develop consumers' **knowledge** regarding the product.
- Increase product awareness.
- Promote Galp's **sustainable image**.
- Gain new customers.

Message/Action

Campaign

Launch "*Ser mais verde*" ads on different platforms (Google, Instagram, among others) displaying Bio LPG to Bottled and Auto LPG consumers. The goal is to familiarize consumers with the new product, emphasize its benefits and strongly enhance Galp's image as a sustainable brand. The ads should allow consumers to directly access Galp's website.

Short Videos

In line with the current promotion strategy, Galp should further develop short video ads on YouTube and partner with activist influencers, such as Ana Varela and Catarina Barreiros, on mass media channels (Instagram) to showcase the product.

Appendix 31: Implementation Plan – Online campaign: Website

1 **ONLINE CAMPAIGN**

Website

Target | Galp clients / New clients

Goals

- Communicate the new **value proposition**.
- Develop consumers' **knowledge** regarding the product.
- Promote Galp's **sustainable image**.
- Gain new customers.

Message/Action

Bio LPG Page

Create a page dedicated to Bio LPG, to present the product, featuring videos or other visual aid materials explaining the product's benefits.

The page should display the different Bio LPG products, how to use them and where to buy them.

Videos

Highlight real-life cases, by providing short videos, where Bio LPG users briefly describe their experience.