ISCTE Business School
Instituto Universitário de Lisboa

THE COMPETITIVENESS OF MODERN RETAIL AND THE IMPERATIVE TO RESPOND TO THE CHALLENGES OF THE CIRCULAR ECONOMY

Diogo Filipe Dias Louro

Dissertation submitted as partial requirement for the conferral of

Master in Management

Supervisor:

Prof. Renato Telo de Freitas Barbosa Pereira, Assistant Professor, Department of Marketing, Operations and Management, ISCTE Business School

Co-supervisor:

Prof. Jorge Manuel Vieira Jordão, Associate Professor, ISEG Lisbon School of Economics & Management

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Many times, we have to face different obstacles in our life, being them personal, familiar, professional or academic. For all of them, we need not only our own willpower, but also mental and psychic support to overcome the barriers.

Over the past year I have been confronted with probably the greatest academic challenge I have had to date. All this path would have been practically impossible without the help and support of all members of ISCTE Business School and the Jerónimo Martins Group involved in this project.

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To everyone involved my biggest THANK YOU!

Abstract

The retail business has been changing a lot in recent years. The traditional retail we knew, where people went to the physical stores to do their shopping, is increasingly becoming extinct. The act of buying is no longer just a singular event, but a shopping experience for the client, which starts with the dissemination in social networks and online platforms, to the physical stores and to all complementary activities which involve the consumer during their purchases. In recent years, demand has been increasingly selective, and consumers are evaluating new preferential factors beyond price, such as convenience, diversity and freshness of products at a retail location.

However, the production and supply cycle of the products is a complex process, where companies do not always adopt the best practices to develop their business. In order to reduce production and distribution costs, there are retailers that choose not so environmentally friendly raw materials, such as plastics and fossil fuels, which have a very negative impact in the production, distribution and consequently during their life time.

With this project, the main objectives will be to evaluate the evolution of retail in recent years, and how to adapt to a Circular Economy era, worrying about the sustainability of the environment and the reduction of waste, but keeping competitive and profitable at the same time.

Keywords: Sustainability, Circular Economy, Competitiveness, Modern Retail.

JEL Classification: L81 - Retail and Wholesale Trade, e-Commerce; Q53 - Air Pollution, Water Pollution, Noise, Hazardous Waste, Solid Waste, Recycling.

Resumo

O negócio do retalho vem mudando muito nos últimos anos. O retalho tradicional que conhecíamos, onde as pessoas se deslocavam às lojas físicas para realizar as suas compras, está cada vez mais extinto. O ato de comprar não é apenas um evento singular, mas uma experiência de compra para o cliente, que começa com a disseminação em redes sociais e plataformas online, até às lojas físicas e todas as atividades complementares que envolvem o consumidor durante as suas compras. Nos últimos anos, a procura tem sido cada vez mais seletiva, e os consumidores estão avaliando novos fatores preferenciais além do preço, como conveniência, diversidade e frescura dos produtos num ponto de venda.

No entanto, o ciclo de produção e fornecimento dos produtos é um processo complexo, onde as empresas nem sempre adotam as melhores práticas para desenvolver os seus negócios. A fim de reduzir os custos de produção e distribuição, há retalhistas que optam por matérias-primas pouco amigas do meio ambiente, como os plásticos e os combustíveis fósseis, que têm um impacto muito negativo na produção, distribuição e, consequentemente, durante a sua vida útil.

Com este projeto, os principais objetivos serão avaliar a evolução do retalho nos últimos anos, e como se deverá adaptar à era da Economia Circular, preocupando-se com a sustentabilidade do meio ambiente e com a redução de desperdícios, mas mantendo-se competitivo e rentável ao mesmo tempo.

Palavras-chave: Sustentabilidade, Economia Circular, Competitividade, Retalho Moderno.

Classificação JEL: L81 - Comércio Retalhista e Grossista, Comércio Eletrónico; Q53 - Poluição do Ar, Poluição da Água, Ruído, Resíduos Perigosos, Resíduos Sólidos, Reciclagem.

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Acronyms

ABACO - Asociación de Bancos de Alimentos de Colombia

APCER – Associação Portuguesa de Certificação

APED – Associação Portuguesa de Empresas de Distribuição

ASC - Aquaculture Stewardship Council

B-On – Biblioteca do Conhecimento Online

BRC – British Retail Consortium

EC – European Comission

ETARI – Estação de Tratamento de Águas Residuais Industriais

EU – European Union

FFFB – French Federation of Food Banks

FSC – Forest Stewardship Council

FSSC – Food Safety System Certification

G.A.P. – Good Agricultural Practices

GWP - Global Warming Potential

HACCP - Hazard Analysis and Critical Control Point

ICIS - Independent Chemical Information Service

IFS – International Featured Standards

ISO – International Organization for Standardization

IUCN - International Union for Conservation of Nature

KPI – Key Performance Indicator

LBG – London Benchmarking Group

LED – Light Emitting Diode

LEED – Leadership in Energy & Environmental Design

LNG – Liquified Natural Gas

MSC – Marine Stewardship Council

Non-GMO – Non-genetically Modified Organisms

ONG- Non-governmental Organizations

PEFC – Pan European Forest Certification

PET - Polyethylene Terephthalate

PGCA – Portuguese German Charity Association

PVC - Polyvinyl Chloride

QR Code – Quick Response Code

RFID – Radio-frequency Identification

RSPO - Roundtable on Sustainable Palm Oil

RSU – Restricted Stock Unit

TCF – Total Chlorine Free

TST – The Forest Trust

UEBT – Union for Ethical BioTrade

UNEP – United Nations Environment Programme

USA – United States of America

UTZ – Universal Trade Zone

VAT – Value Added Tax

Executive Summary

In recent years, we have been moving towards a critical situation of overexploitation of resources, and devastation of forest and maritime areas. Ecosystems are increasingly at risk, and many natural habitats have already been destroyed or are fully endangered. Since I am developing my thesis in the Jerónimo Martins Group, I intend to alert not only the retailers operating in Portugal, but also to raise awareness of all agents involved in the extraction of resources, in the conveyors of the materials, as well as consumers who need to adopt new buying and selection habits.

In Europe, between 3 and 4 billion tonnes of waste are generated annually, which eventually drain into the sea or infiltrate the soil, contaminating ecosystems. This means that there is a very significant part of waste that after its life cycle has no treatment.

The Circular Economy offers businesses an opportunity to increase resource productivity, decrease their dependency, increase employability, improve competitiveness and trigger innovation. By reconciling the circular economy with technology, Europe could improve the productivity of its resources by up to 3%. By 2030, this increase will allow not only a cost reduction of 600 billion euros per year but also a GDP increase of up to 7% compared to the current stage of development.

Thus, it is necessary to create strategies and alternatives that allow the collection and treatment of materials at the end of their life cycle, in order to increase the longevity of the products and reduce their impact on the environment. On the other hand, it is important to establish emission limits for polluting gases, to alert industries and impose penalties when these limits are exceeded.

In order to understand how companies are adapting to this new generation that invariably needs to be sustainable and integrate circular economy into their daily processes, a survey was developed to know what kind of measures are already being implemented by the companies in Portugal, and what are their goals for the future. This survey was conducted to the 5 biggest players in the food retail market in Portugal, such as Jerónimo Martins, Sonae, Os Mosqueteiros, Aldi and Auchan. The objective is to analyse how companies are positioning themselves today in a way that reconciles their profitability and competitiveness, while adopting sustainable practices and reducing emissions of toxic gases to the environment. Several parameters have been taken into account, such as the

type of raw materials used, concern with the sustainable methods adopted by suppliers, reduction of waste of water in their processes, ecodesign, among others.

The results show that companies are effectively aware of climate change and the consequences of increasing the ecological footprint, and so, seek to integrate the concept of circular economy into their processes, adopting a set of more sustainable practices and using ecological raw materials that reduce the impact on the environment.

Throughout this thesis, a literary review will be carried out to introduce some themes such as the concept of circular economy, threats to our ecosystem caused by companies, the evolution of retail, and finally, how companies can maintain their competitiveness combining sustainable practices with efficiency.

Subsequently, the results of the company surveys will be demonstrated, and the answers will be analysed in order to understand the techniques that are being used to reduce the impact on the environment.

1. Introduction

We live in a period in which the food and non-food retail are increasingly competitive, and every year new supermarket chains, shopping centres, or even small local commerce appear. Thus, it becomes "mandatory" for managers of these businesses to differentiate and adapt to the changing circumstances of the market in order to survive and "navigate a Blue Ocean."

According to APED data, in 2016 there was a 3% increase in Portuguese retail (food and non-food) compared to 2015, largely due to small improvements in the country's economic situation, and consequent increase in consumer confidence. Furthermore, according to APED data, in the first half of 2017, there was a growth of 3.8% over the same period of the previous year, which conveys a clear notion of increased consumer confidence resulting from the economic recovery that the country is facing. This increase in confidence is proven through a report dated 05-07-2017 by the APED website, where it highlights that consumer confidence reached a record high in June, beating the peaks previously reached in 1997.

All these indicators are very explanatory of the constant development of the retail in Portugal, where companies seek to increasingly meet the expectations of customers, worrying about offering the best possible conditions for them to continue to consume. On the other hand, there is an increasing concern about the relationship between retail and the environment, and APED has even released a new version of the Good Environmental Practices Guide for the retailers to adopt new policies and strategies focused on circular economy and low carbon emissions.

The overuse of some materials, such as plastics, ends up generating an excess of waste that takes many years to decompose, even polluting the oceans. At the same time, the consumption of energy from fossil fuels contributes to the worsening of the carbon footprint and endangers non-renewable sources of energy. Thus, corporate sustainability should increasingly ensure not only the growth of the company with an adequate level of profitability, but also take care of the preservation of the context in which it operates.

As it happened in the last year in Portugal, the country experienced the greatest period of extreme heat and drought of the last 70 years, and some water dams were only at 10% of their maximum capacity. This situation is extremely worrying and frightening, so the government needs to take a stand and create measures to save resources. The circular

economy is the future, and it becomes imperative that companies be the first to set the example and look at their practices to understand that it is crucial to change the paradigms so that resources are not exhausted, nor that the next generations feel the impact of past mistakes.

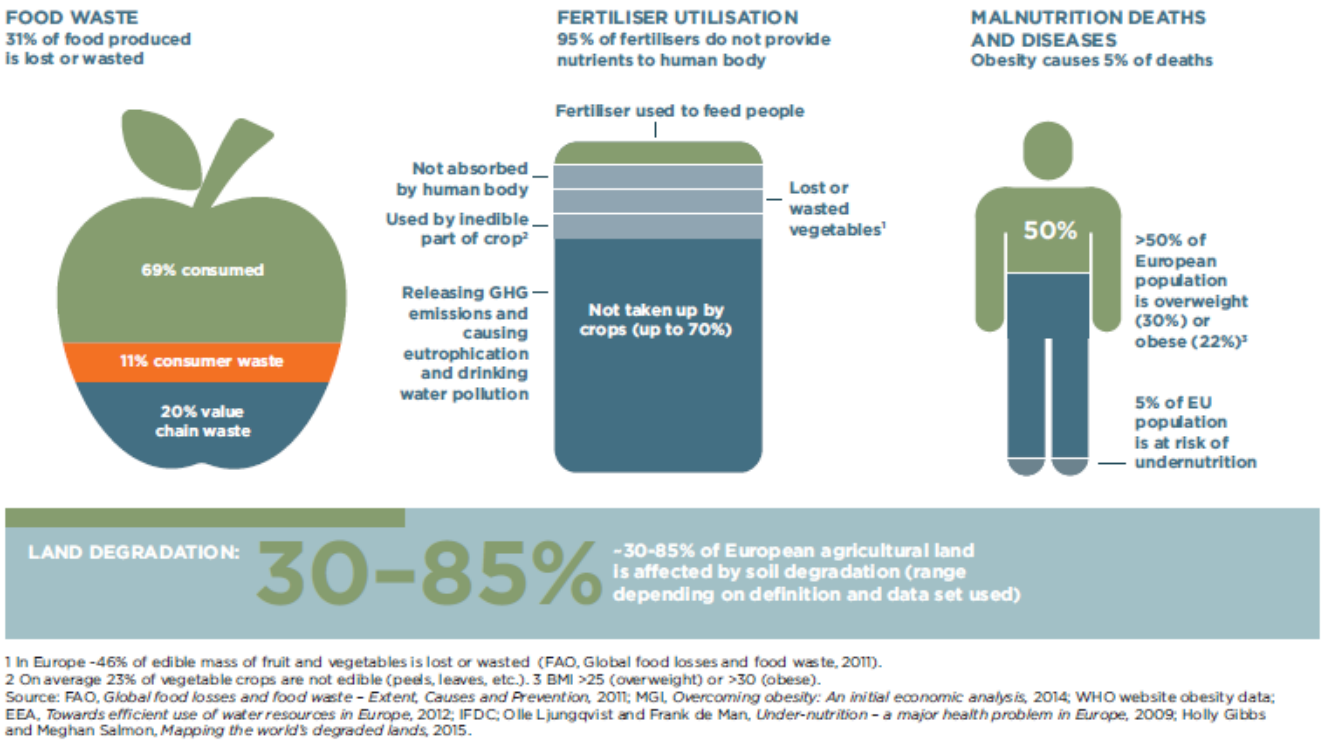
2. Literature Review

2.1. Circular Economy

2.1.1. Introduction to Circular Economy

Research by McKinsey & Company (2017) has highlighted that in 2012, the average of materials used by each European was 16 tonnes. From these, 60% were discarded or deposited in landfills, while only 40% were recycled. Europe has lost 95% of material and energy value after the end of the life cycle, while only 5% is the result of the energy recovery and recycling. Cars are parked 92% of the time; 31% of food is wasted during the cycle; offices are only used 35-50% of the time; the average assets life is only 9 years. In total, all these factors have an annual cost of 7.2 trillion euros for Europe in the 3 sectors (mobility, food and built environment).

Figure 1 - Average Food Waste in Society



Source: McKinsey&Company 2015. Growth Within: A Circular Economy Vision for a Competitive Europe

Europe is the largest importer of resources in the world (€ 760 billion per year), 50% more than the USA. Europe imports 60% of its fossil fuels and metallic resources. This large dependence on resources makes Europe dependent on price volatility and

geopolitical uncertainties. This also creates a competitiveness problem in European industries, since imported materials account for between 40-60% of the total cost of manufacturers, and European firms suffer from competitive disadvantages due to the high cost of resources (McKinsey & Company, 2017).

Only 40% of the water reaches plants, and soil degradation affects 30-85% of European agricultural land. In addition, Europeans consume on average 40% more calories than recommended, and over 50% of the population is overweight or obese. All these numbers represent waste (McKinsey & Company, 2017).

Brundtland (1987), refers that Sustainable Development consists in "development which meets the needs of the present without compromising the ability of the future generations to meet their own needs".

Cooper (1999) asserts that Circular Economy means: "The model of a linear economy, in which it is assumed that there is an unlimited supply of natural resources and that the environment has an unlimited capacity to absorb waste and pollution, is dismissed. Instead, a circular economy is proposed, in which the throughput of energy and raw materials is reduced."

Circular Economy enables products that are at the end of their life cycle to be transformed into new resources, minimizing waste in the ecosystem by reusing products, recycling what cannot be reused, repairing damaged objects, and remanufacturing what cannot be repaired. A study by the European Union identified that the adoption of the circular economy would allow a 70% reduction of greenhouse gas emissions by each nation. The concept of circular economy is also related to Lavoisier's Law of Mass Conservation, according to which "nothing is lost, everything is transformed" (Iustin-Emanuel et al., 2014). The product life cycle begins with the extraction of raw materials, production of materials, use and disposal. However, what often happens is that there is an overexploitation of raw materials, massive production and consequently large amount of waste. This production of waste leads to the deterioration of the environment in two ways: by removing natural capital from the environment, or by reducing the value of natural capital caused by waste pollution. Pollution can also occur at the time of acquisition of resources. In this type of economy there is great loss of resources, erosion of the ecosystem and continued threat of economic prosperity (Murray et al., 2015).

The generation of waste is a direct consequence of material consumption, due to the natural process of production and its obsolescence. During their lifetime, products may dissipate into the environment due to their use, or they may become waste at the end of their lifetimes (Tisserant et al., 2017).

In order to promote and encourage countries to adopt a circular economy policy, the European Commission has decided to set some targets within the Circular Economy Package, which includes a target for recycling municipal solid waste (at least 65% of all waste by 2030), and solid waste landfill (maximum 10% by 2030). This package also includes the promotion of industrial symbiosis and ecodesign (Tisserant et al., 2017). However, recent studies show that only 6.5% of the total material processed in 2005 was recycled (Haas, 2015).

The concept of circular economy is related to the premise of closed-loop economy and "design to redesign thinking", including the idea of low energy consumption, low pollutants emissions and great efficiency. The circular economy also has the function of restoring, since it is not only preventive, but also corrective of the damages caused previously (UNEP, 2006).

Once applied correctly, the circular economy allows new models of production, consumption and added value, impacting the sustainable development of the economy, environment and society. The objective of the circular economy should embrace all the company's activities involving production, distribution and consumption in order to reduce, reuse and recycle the materials involved (Murray, 2015).

According to Hannon (et al. 2016) research, the adoption of the growth-within model will allow economic gains of €1.8 trillion per year until 2030, explained by some measures such as car sharing, automatic driving, electric vehicles and better materials can lower driving costs by 75%.

There are 3 major principles of circular economy:

- Preserve and improve natural capital by controlling finite resources and balancing the flow of renewable resources.

- Optimize resource efficiency by maintaining the circular flow of resources, components and materials in use at all levels.

- Make the system more effective by eliminating negative externalities.

We can consider that the circular economy business is based on two models: one that enhances the reuse and extension of product life through repair, remanufacturing and upgrades; another that transforms spoiled products into new ones through recycling. This whole process of circular economy allows the construction of new infrastructures and more skilled jobs. There is then a change from the concept of consumer to user and creator. In recent years, companies have increasingly sought out young graduates who have the knowledge and skills to transform their business models into more sustainable practices, in order to head the company into the future. On the other hand, government and policy must adopt a new legislation allowing the inclusion of environmental and emissions taxes to promote the circular economy in companies.

According to Stahel (2016), there are 3 types of industrial economy: linear, circular and performance:

- **Linear economy** transforms natural resources into basic materials and products for sale. At the point of sale, the ownership and responsibility of the risks and wastes passes to the buyer. This new owner will be responsible for deciding whether the old products will be recycled or dumped.

- **Circular economy** allows the reprocessing of goods and materials, generating work and saving energy while reducing the consumption of resources and waste.

- **Performance economy**, the manufacturer retains ownership of the product and the resources, being responsible for the risk exposure and waste costs. In addition, performance economy focuses on solutions rather than products, resulting in their waste prevention profits.

However, adopting a circular economy policy involves some costs. Companies need to invest in social, technological and commercial research and innovation. Environmental economists and scientists should assess the ecological impacts, costs and benefits of products involved. It is necessary that ecodesign of products be implemented from the embryonic stage, so products can be recycled and/or reused later (Stahel, 2016). On the other hand, it is essential to raise awareness among manufacturers and consumers of their responsibility and impact on the environment by using certain resources and products. This communication should be made not only by scientific journals and articles, but also by fashion magazines, in order to raise the readers' awareness more personally. According to Stahel (2016), the government must also create laws that reward companies that adopt

environmentally sustainable measures as a way to promote and encourage the reduction of pollutant emissions and waste. On the other hand, charges for the use of non-renewable resources and for polluting emissions should be included. Also, Value Added Tax (VAT) should be applied in activities such as mining, construction and manufacturing, and not in stock management activities such as reuse, repair and remanufacturing.

A business model based on ecological concerns and waste reduction has a significant impact on the economy and society (Iustin-Emanuel et al., 2014):

- Creation of new jobs

- Increasing the competitiveness of companies

- Significant reduction in the volume of resources consumed

- Extending the products life

- Reduction of waste

2.1.2. Threats to the Ecossystem

China has been the country most committed to an environmental policy in accordance with the circular economy, adopting various environmental measures that help reduce the impact of its business activities on the environment. Several laws have been implemented in recent years to promote greener production, pollution prevention and waste control. These measures served to encourage small and large companies to adopt ecodesign and pollutant-free production, with the aim of creating an eco-city and encouraging the population to adopt social practices oriented towards recycling (Yuan et al., 2006 Geng et al., 2008).

However, conflicts can often occur between the sustainability strands. When the social dimension (stakeholders, human rights, and societal well-being) clashes with the environmental and economic dimensions, new barriers may arise that prevent companies from adopting sustainable environmental practices (Gray et al., 1994; Mathews 1995). While there is agreement on the environmental benefits of a circular economy, such as redesign of manufacturing processes and type of raw materials used, there is still no consensus on the benefits it can bring to society, gender, race, religion, financial power or equal social opportunity (Murray et al., 2015).

There are also other negative aspects associated with the circular economy, such as the fact that there is much deforestation with the objective of planting oil palm trees, leading to the destruction of the natural habitat of many animal species (Fitzherbert et al., 2008). In addition, ethanol production requires more fossil fuel than the one that is produced, and over-exploitation of biofuels has a very negative impact on the flora, leading to the destruction of millions of hectares of forest for the planting of soybean fields (Pimentel, 1998). On the other hand, often the idea that products with longer durability are more efficient can mean higher energy consumption and greater impact on the environment. This often happens when factories ponder between using plastic or wooden materials. When these products are destroyed and recycled, plastics can consume much more energy involving higher costs. Windmills and solar panels also contain materials that are quite difficult to recycle (Murray et al., 2015).

According to Newton (2017) research, during the last years, several changes have been observed in the habits of consumption and the impacts that human activities have on the atmosphere, such as:

- Fast urban population growth

- Exponential growth of consumption with great impact on the biosphere

- Increasing CO2 concentrations in the atmosphere, leading to global warming and climate change, such as rising sea levels, storms, floods and extreme drought

- Growth of ecological footprint, which shows that the population's demand for natural resources is 50% higher than what nature can regenerate.

Research by McKinsey & Company (2015) has provided evidence that there are 3 areas where the impact of overexploitation of some resources has been more negative, and where it must be managed more carefully in order to reduce the side effects:

- Preserve and enhance natural capital – controlling finite resources and balancing the flow of renewable resources, such as replacing fossil fuels with renewable energy or returning nutrients to ecosystems.

- Fresh water quality and depletion: 53% of surface water in Europe is not in good ecological condition. Rivers and transitional waters are in worse condition than lakes and coastal waters, and the situation worsens in central and north-western Europe where intensive agriculture prevails and the population is dense. 13% of renewable freshwater is extracted for human activities from surface water and

groundwater. According to data from the European Commission in 2007, water scarcity affected 10% of the territory and 17% of the population, and in the last 30 years droughts in Europe cost 100 billion euros.

- Soil degradation: the growth of agricultural production is impoverishing natural capital, mainly due to climate change, poor use of fertilizers, irrigation and machinery. More than 25% of European soil is eroded by water, with negative effects on soil functioning and water quality.
- Biodiversity loss: 66% of species in Europe and 77% of natural habitats remain in unfavourable conditions and are usually replaced by industries and shoppings malls.
- Marine and Coastal ecosystem quality: threat of ecosystems due to overfishing, seabed damage, marine pollution (litter and underwater noise), introduction of invasive species and acidification of the seas.

- Optimize resource yields – through the circulation of products, components and materials in use; sharing and increasing their life cycle. This implies a new design for remanufacturing, remodelling and recycling to keep components and materials in circulation.

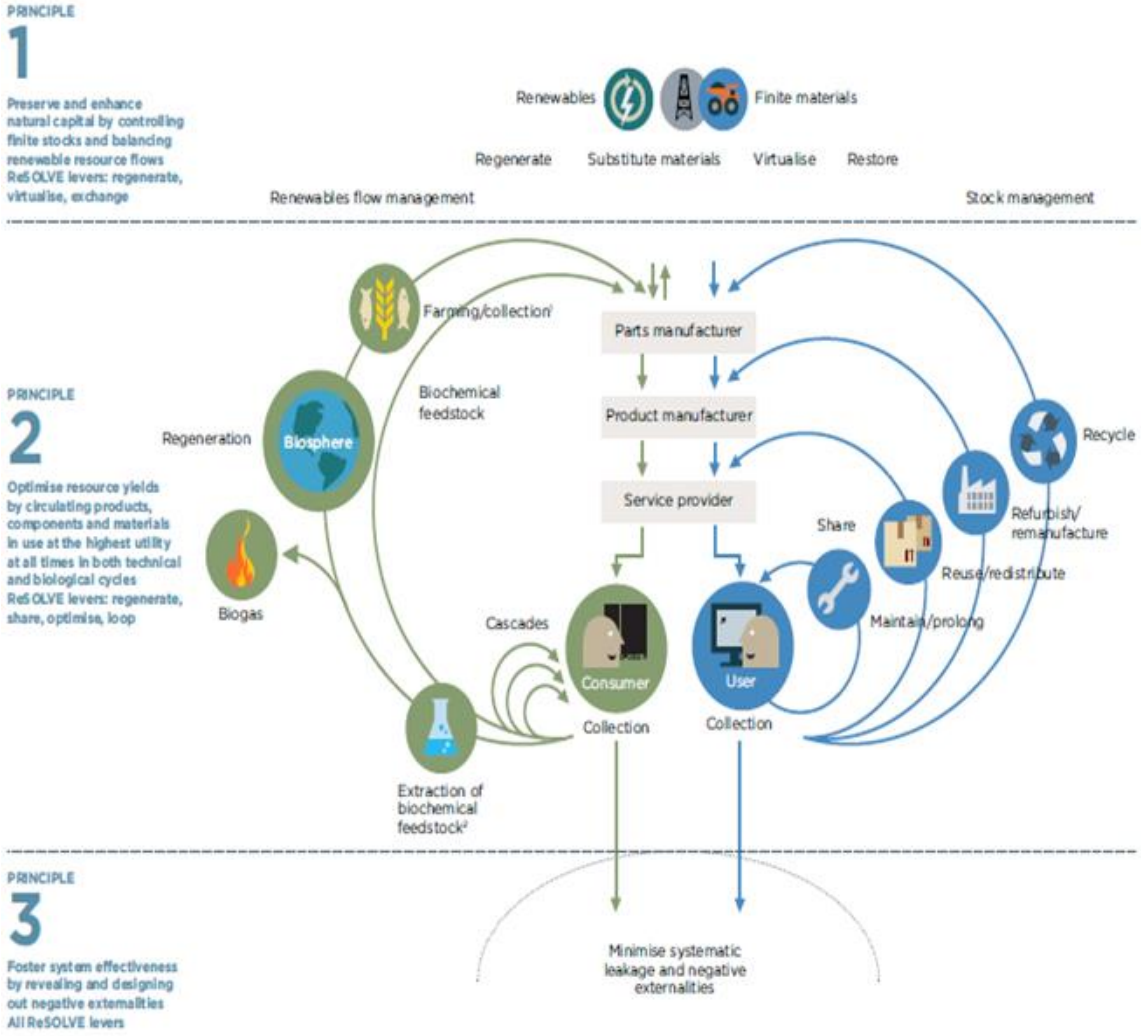
- Material consumption: the consumption of materials has increased significantly in recent years, with Europe being the world's largest importer of resources, having imported 60% of its fossil fuels and metallic resources in 2011.
- Nutrient losses: the average levels of phosphate and nitrate in European rivers have declined significantly in recent years as a result of improved wastewater treatment and lower levels of phosphorus in detergents.
- Waste of products and materials: the largest producers of electrical and electronic waste are in Europe.

- Foster system effectiveness – disclosing the harmful effects of some materials, such as water pollution, soil, air and noise, climate change, toxins, congestion and negative effects on health.

- Urbanisation: the increase in urban areas has triggered congestion and soil contamination rates, contributing to the increase of heat-related diseases. The reduction of green spaces also affects public health, mental and social well-being, urban biodiversity, air pollution and noise, erosion prevention and soil flooding.
- Loss of health and quality of life due to noise pollution: noise pollution has increased the risk of diseases, especially cardiovascular diseases.
- System impact of emissions: in 2000, emissions of nitrous oxide, nitrogen and ammonia in the air and nitrogen in water caused estimated damage in the European Union of Exchange UR 70-320 billion.

- Limited carbon-carrying capacity: CO2 emissions peaked in the 1970s and have not declined since then. Greenhouse gas emissions are 3-4 times greater than they should be to keep climate change below the 2°C threshold.

Figure 2 - Circular Economy Model



Source: Ellen MacArthur Foundation, SUN, and McKinsey Centre for Business and Environment; Drawing from Braungart & McDonough, Cradle to Cradle (C2C).

2.1.3. Techniques to reduce ecological footprint

There are some measures that can be taken to reduce the impact of natural resource exploitation on the environment (Newton, 2017):

- Reduction of the use of natural resources, thus reducing the ecological footprint through dematerialization of industrial processes and construction and promoting the adoption of eco-efficient technological principles.

- Reduction of emissions and waste, especially in the decarbonisation of energy and in the treatment of rainwater and wastewater.

- Replacement for intelligent and regenerative urban systems and processes in order to achieve more effective economic, social and environmental management of cities.

- Improvement of urban environmental quality, such as waterways and green spaces.

- Improvement of living conditions and well-being throughout the metropolitan regions.

Research provided by Newton (2017) has introduced a framework of actions that can help mitigating the ecological footprint and reducing carbon emissions.

Mitigation and Adaptation

Pathways to sustainable development include mitigation (decarbonization) and adaptation (resilience).

Carbon Mitigation Over the Built Environment Asset Life Cycle

All assets have a life cycle ranging from the initial design, performance, and end-of-life phases. However, some policies and practices can be implemented in ways that minimize carbon emissions and the ecological footprint throughout their life cycle. Nowadays, the government has already got instruments and tools to evaluate the eco-efficiency of the product life cycle and its impact on the environment.

Carbon Mitigation Across the Asset/Infrastructure Supply/Value Chain

Another factor directly related to the product life cycle is the way in which its supply is made. In this process, the main objective is to optimize decision making in all stages of the acquisition process, involving the commitment of all agents, from the customer, suppliers, designers, builders, etc.

Sectoral Carbon Mitigation Based on Technology Transitions

Adapting cities to sustainability policies is a key process in reducing the impact of their urban activities on the environment. It is important that society is able to take advantage of innovative technologies, products and processes that can replace current practices. Some of the benefits of implementing these measures are:

- Energy transition: from a fossil fuel-based economy to one based on renewable energy sources.

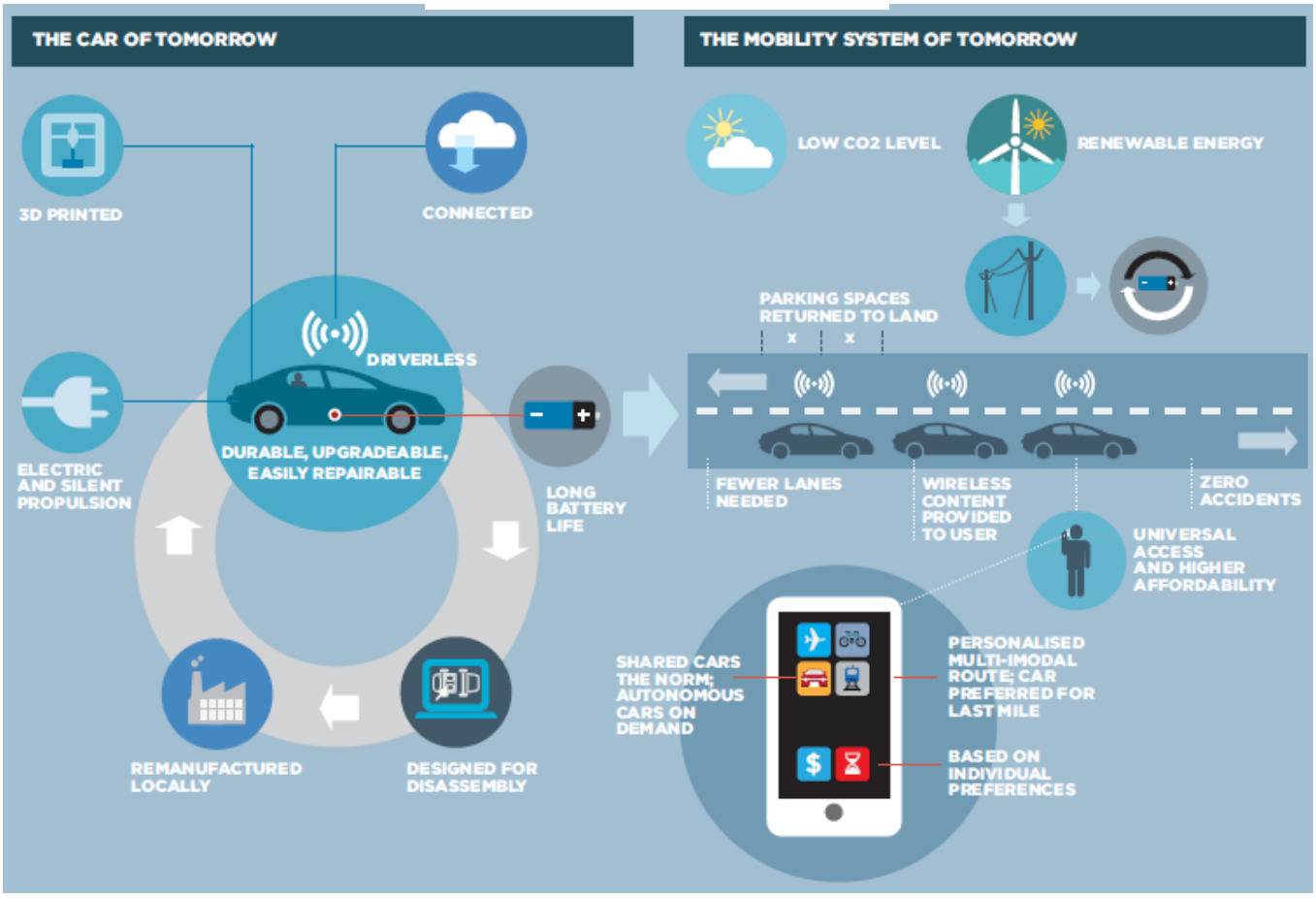
- Water transition: from a centralized use-disposal system to a decentralized hybrid system incorporating recycled rainwater and wastewater as an additional source of supply.

- Transition of waste: from a system based on resource extraction, manufacturing and dumping, to a circular economy based on industrial ecology, cradle-to-cradle manufacture and dematerialization of decarbonization of the economy.

- Communication transition: from an era of low-quality analogue sound systems transmission to a digital wireless age, encompassing "internet of things", which enables the technological world to be connected more ecologically and less emissions.

- Transition of transport: replacement of vehicles powered by oil, by hybrid vehicles, solar-electric or solar-hydrogen; introduce autonomous vehicles in a way that minimizes urban transport; bet on car sharing; increase the use of public transport, cycling and hiking.

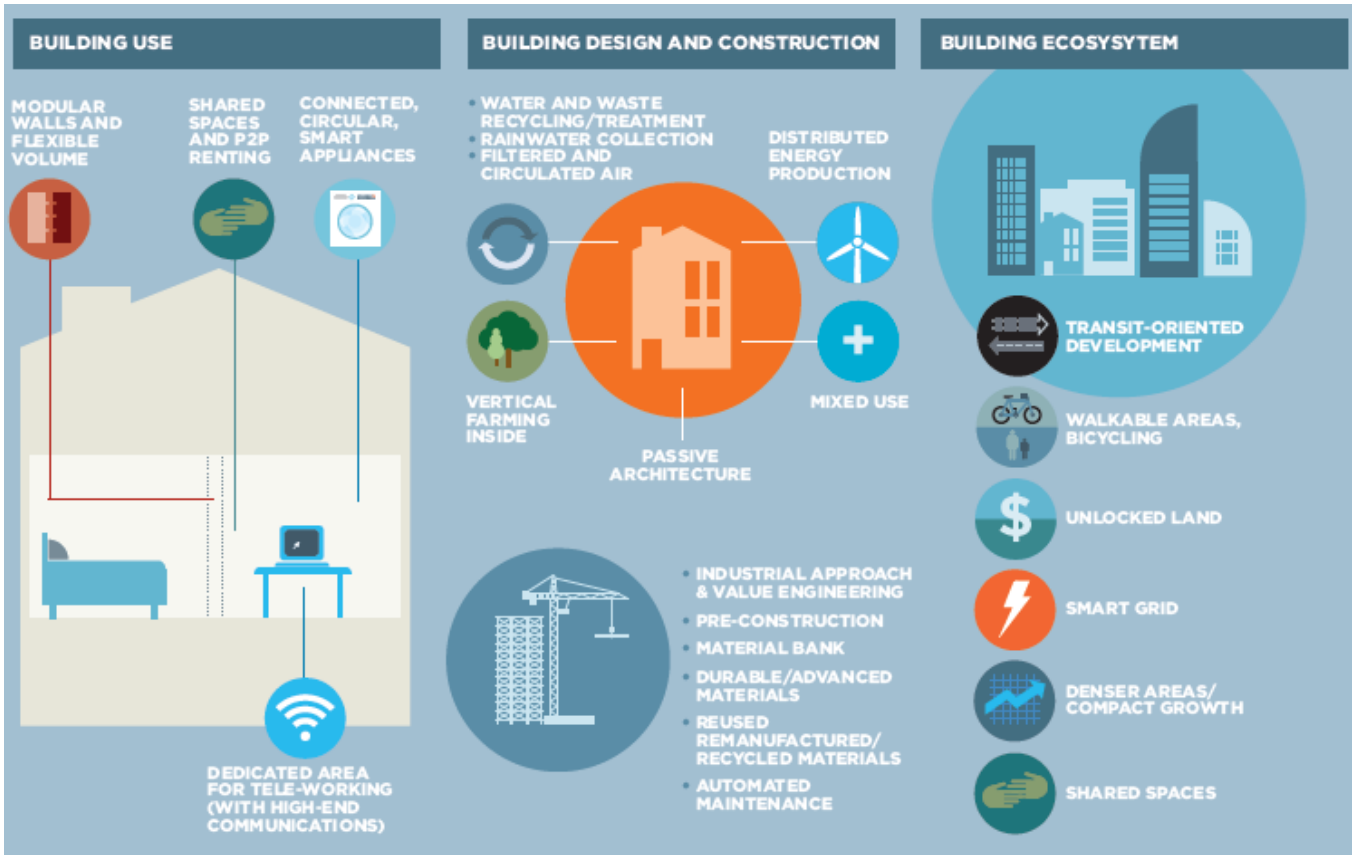
Figure 3 - Future Mobility System



Source: McKinsey&Company 2015. Growth Within: A Circular Economy Vision for a Competitive Europe

- Transition from forms of urban construction: from buildings that meet a limited number of criteria focusing primarily on safety and minimum costs, to eco-efficient buildings whose life cycle performance is evaluated from design, off-site manufacturing and subsequently assembled on site, and where maintenance and dismantling is optimized through information models.

Figure 4 - Circular Build Ecosystem



Source: McKinsey&Company 2015. Growth Within: A Circular Economy Vision for a Competitive Europe

The process of collection and recycling is important to be carried out in the fastest and most economical way. Recycling points should be constructed in a quick and easy way, so the waste is collected, separated and transported from the collection point to the recycling point as quickly as possible, at the lowest cost and with the minimum environment impact (Djuric et al., 2017).

MBO-T is a technological combination of mechanical, biological and thermal waste treatment processes. This process allows the processing of mixed municipal solid waste under controlled conditions of recycling and reuse of raw materials and energy. The objective is to avoid climate change, infectious diseases in the population, create new social values, generate new raw materials for the circular economy and obtain new types of energy for the industry development (Djuric et al., 2017).

Composting is the oldest recycling process used, which consists of the junction of organic waste from different sources, placed in a tank and destroyed by different controlled

aerobiological processes. The final product obtained is rich in nutrients, and later used as fertilizer for soils (Djuric et al., 2017).

One of the methods applied by some companies is based on the deposit system, allowing the consumer who buys plastic products or glass bottles to get back a certain value of the total price of these products when he returns the empty containers in the store. This method already exists in several European countries and ensures that up to 90% of the waste returned to the stores is recycled. However, the packaging industry is the largest opponent of the implementation of this method, since the cost of introducing a deposit system requires increasing the fees that are paid for the disposal of packaging (Djuric et al., 2017).

2.2. Evolution of Modern Retail

2.2.1. Traditional Retail

In the 1990s, the concept of modern retail was based on a small group of multinational retailers such as Auchan, Carrefour, Lidl, Tesco, Walmart among others. The expectations were that in the future would prevail large supermarkets and hypermarkets, convenience stores and discounters (Child et al. 2015).

Hypermarkets have always been in great demand, since they offer a wide variety of products, and at a level of productivity that other types of retail do not allow. Hypermarkets are often able to price low, attracting more consumers than other retail stores (Child et al., 2015). But the countries where the hypermarkets operated had certain characteristics: good roads and motorway connections, a large middle class earning good salaries that allowed them to enjoy the prices practiced in these establishments, and large urban and suburban areas with apartments large enough for people to keep products purchased in large quantities. On the other hand, these markets grew at a time when women did not return to work immediately after having children, and thus were able to go shopping during the day (Child et al. 2015).

According to Petersen (2016) research, there are 7 Reasons why traditional retailers are striving to be profitable:

1 – No record of consumer purchase history

The Point of Sale was created with the purpose of recording which items were sold, and at what price, without relationship between retailers and consumers. Nowadays, the consumer experience through the omnichannel involves several relationships that are established inside and outside the store.

2 – Consumers are the new Points of Sale, not the stores

Consumers now have the power to decide on where they want to make their purchases, when, how to pay and how they want to receive their orders. The smartphone became the point of sale, everything being a click away.

3 – Traditional retailers do not always create relationships with their customers

Nowadays, the most important thing is not to sell a product, but to create a close relationship with the customer to make them feel comfortable going to the store. Amazon, for example, has created a historical record of consumers' wish lists, purchases, and shipping ways. In this way, traditional retailers need to adapt to these new requirements and develop new ways of approaching the customer.

4 – The increase in digital consumption has reduced affluence to stores

Digital platforms have seen significant advances in recent years, with consumers now acquiring music, movies, games and news online. This has caused some physical stores, such as Blockbuster, to simply disappear from the market. Also, CDs and DVDs are practically extinct, resulting from the emergence of streaming platforms such as Spotify and YouTube.

5 – Retailers are looking to increase the volume of products in the store to sell online

Some traditional retailers facing the migration from offline to online, are encouraging their consumers to buy online, in order to increase the sales force on their sites. However, these traditional sites need to face another problem, which is the power that some sites, such as Amazon, currently have. Retailers need to be extremely competitive in their

pricing and need to know that consumers are accustomed to some Amazon features such as free shipping, tracking and return of defective products.

6 – Some retailers cannot balance the way they sell on the offline and online channel

Some retailers have built their stores from the scratch, having adapted all their operations to the offline channel. With the introduction of the online channel, some of these retailers are facing difficulties in adapting their operations, because the processes are too ingrained and difficult to adapt to a new sales method.

7 – Employees are treated as an expense, not as an added value to the company

One of the aspects that is totally different between the offline channel and online is the fact that there is no employee to help us and create a relationship of proximity throughout the purchase process in digital support. Even with all the support and widgets that are on the websites, many consumers continue to consider that the personalized way through which an employee helps in the process of choosing is a differential factor at the time of purchase. However, many retailers consider that employees are no longer an asset, being considered an extra expense, and eventually being withdrawn from the market. The same happens with the training that they initially received to personally assist the customers.

Traditional Retail vs Modern Retail

Over the years, the evolution of retail has been increasing, and there are several processes that have been improved and became more automatic. According to (Rangaswamy, 2012), these differences have become more evident in the following processes:

Order Acquisition

- Traditional: the employee moves to the store, counts the stock, identifies the promotions (if any) and suggests a purchase order to the supplier. The last decision will be taken by the supplier.

- Modern: the number of orders would be automatically identified by the company's IT system, which would then place the order to the supplier via email.

Order Execution

- Traditional: the distributor would deliver the order 1-2 days after receiving the order. In case the distributor is constantly on the road, this distribution can be made almost immediately upon receipt of the order, depending on the proximity to the store.

- Modern: delivery times are set by the manufacturer and must be accomplished. Otherwise, the distribution centre would be penalized, and delivery would only be made after completion of all deliveries on that day. Some modern retailers prefer deliveries on pallets, and in case the company adopts cross-docking, deliveries can be from one pallet per store. Often deliveries must be made by lorries, and in this case, it may be at night when there are no heavy vehicle restrictions. In other cases, deliveries can be scheduled by product categories, so they can be done on different days of the week.

Promotions

- Traditional: companies usually carry out promotions as required.

- Modern: manufacturers are responsible for all promotions, being unique to each retailer.

New Launch

- Traditional: the manufacturer would be responsible for launching the new products with the retailers and would put the necessary quantity in the store according to the number of orders.

- Modern: the launch of the new products would have to be informed in advance, and it may be necessary to pay some fees for placing new products on the market.

In-Store

- Traditional: When the stock of products is received in the store, the retailer organizes them according to the shelves and the frequency of buying. When a customer orders one of the products, the retailer moves to the shelf and delivers the product to the customer.

- Modern: the products are available on the shelves, and the customer has direct access to them, not having to ask the retailer. In case it is not available on the shelf, the customer assumes that the stock is exhausted, or may have been forgotten to replace it on the shelf. Thus, it is important that retailers regularly refill their shelves in order to make the flow of purchases constant.

Payment

- Traditional: payment to the seller or distributor is made at the time of delivery, or on the next visit.

- Modern: modern retailers usually ask for a long period of credit from manufacturers.

Scorecard Measures

- Traditional: traditional retailers typically do not have a scorecard model that allows them to evaluate manufacturers. Usually this evaluation is done according to the regularity of deliveries, time between order and delivery, and the rates of completion of orders.

- Modern: modern retailers often have a scorecard model, where they evaluate the availability of deliveries, stock levels, fill-in rates, and delivery on time.

2.2.2. Trends in Retail

Nowadays, the buying process is increasingly moving from the offline to the online channel. By 2030, 1 in 4 Western Europeans will have reached retirement age, so purchasing power will be reduced. In this way, many companies will have to reduce their costs and sales prices to have profit. With the reduction of the mass market, new consumer segments will be more concerned with healthy food, environmentally friendly products and convenience (Krings et al., 2016). To satisfy these small segments, many companies will have to reinvent themselves and innovate in their supply to keep pace with demand trends. On the other hand, consumers are increasingly making purchases from different retailers, and from different countries. This has given rise to new retailers: Discounters. Also, the online market has grown exponentially in Europe and can reach 15% of the market in selected European countries by 2030. There are 3 trends that will transform the

consumption of goods: vertical integration, digitization and aggressive pursuit of cost leadership by large companies (Krings et al., 2016). In vertical integration, some companies started to import exclusively from some specialized suppliers. In the digitization, more and more companies adopt digital and technological techniques in the interaction with consumers and create loyalty with them. Many companies look for cost leadership, through greater efficiency and lower costs, and bet on aggressive pricing to gain market share. In addition, it is often difficult to predict natural or unforeseen disasters that delay the delivery of products, and it is advisable to set up pre-warning systems to detect delays in deliveries or to determine alternative routes for deliveries. It is also crucial that companies can recruit the best talent through flexible human resource systems, in order to create a competitive advantage over their competitors (Krings et al., 2016).

Omni Channel

The retail world has evolved in recent years, and consumer choice over the shopping channel has changed, and it has become as important as product choice. Nowadays, consumers take into account the shopping experience when choosing a store. Due to the new consumption habits, traditional retailers have felt some problems, especially in the need to transform their sales channel into omnichannel. One of the problems that have made sense is the need to improve the efficiency of supply chain management (Zhang et al., 2017).

In the new retail era, the supply chain must be concerned with improving customer service and operations in order to break down distribution barriers and provide its service to internal and external customers (Zhang et al. 2017).

In traditional retail, the strategy is company-centred, where the goal is to define the products to be sold and the channel. Companies tend to focus on the quality of the product and its cost, and which channel best distributes the product to the customer to cover a niche market and increase sales. Sales channels are managed by different business units, using independent resources, different KPIs and alternative operations teams (Zhang et al., 2017).

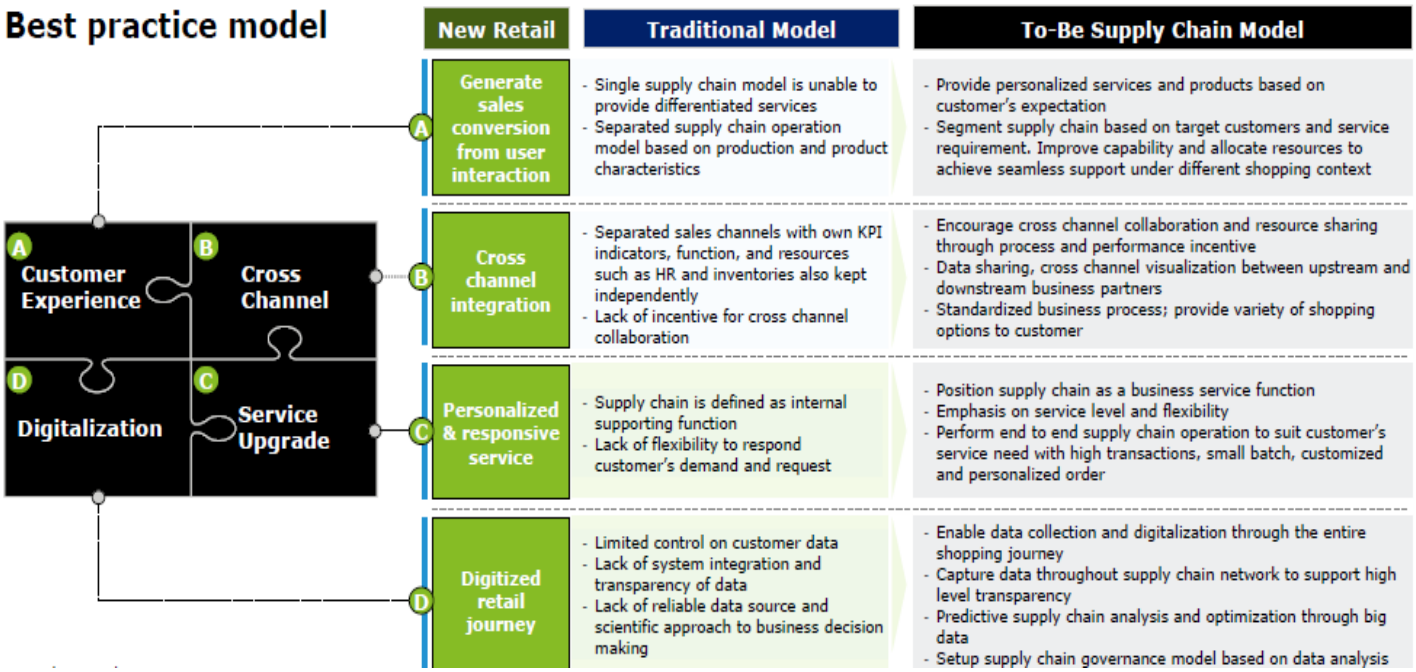
In modern retail, the strategy is customer focused, where the company seeks not only to sell its products but to associate a shopping experience with the customer. The company

must focus on the customers, and seek to interact with them, care about their well-being, and create a close relationship for them to feel comfortable throughout the buying process, and thus establish loyalty with the company. The boundaries between the online and offline channel are more frequent, so it is critical for suppliers to study consumers and storage patterns in order to improve the service offered and anticipate the needs of their customers (Zhang et al., 2017).

Supply Chain Transformation

In the traditional channel, the interaction between suppliers and customers is quite limited, where the objective is only to sell products through the channels. Along the value chain, there are some communication barriers and information gaps, compromising the quality of service. In the new model of the value chain, there is fast and direct communication between suppliers and customers, and channel operations are driven by consumer, product and order digitization (Zhang et al., 2017).

Figure 5 -Transformation of a Traditional Retail Model in a New Retail Model



Source: Gong, G., Liu, H., Zhang, J., Song, J., Jin, S., Yang, S., & Zhang, T. 2017. Transformation of Traditional Retailer in the Era of New Retail.

In an omnichannel strategy, it is necessary for retailers to allocate resources based on demand rather than inventory. The key is to communicate with consumers directly, and where company decisions must be based on customer demand. The focus should be providing the best customer service and be flexible enough to respond quickly to market trends (Zhang et al., 2017).

For retailers to adapt to highly volatile market demand, supply chain planning needs to be based on coordinating functions, forecasting effectiveness and supply chain flexibility. With the evolution of technology, more and more companies apply this knowledge in the planning of strategies and demand forecasts, to anticipate the needs of customers. Logistics can be very important in the flexibility and quick response to demand, by minimizing the size of the bundles provided and by increasing the order fulfillment service, based on the just-in-time system (Zhang et al., 2017).

Given the continuous increase in online retail, Herring (et al. 2014) has created the STORE framework, which allows analyzing the evolution of the retail effectively:

- The incredible shrinking footprint: in recent years, online retail has developed quite a bit, with some companies reinventing themselves in a way to keep up with trends. Amazon, for example, bet on prices 13-20% lower than average, a diversity of products 17 times higher than the average retailer, costs 3-4% lower than competitors, and the highest satisfaction score of its customers.

- A framework for change: shifting the focus from just one store to a multichannel requires shifting paradigms and already rooted work methods. The terms convenience and efficiency have different meanings, and consumers now expect to be able to shop online and receive their orders at home, or move to the nearest pick up point, the possibility of paying for products through different methods, and being able to find discounts and online deals that they would not normally find in physical stores. In some companies, the "Click-and-Collect" method has been a very efficient way to serve the customers with quality, being able to move to a more convenient pick up point and collect their purchases.

- Start by redefining the role of the store: it is important for retailers to understand the role of the physical store, and whether their customers appreciate factors such as convenience and closeness, efficiency, inspiration, instant gratification, information and service demand, entertainment and social interaction, and ultimately the experience of brands and products.

- Tailor categories accordingly: customer priorities should be considered as critical for business in order to ensure that the stock is continually restored in due proportions and that the allocation of space is optimized by taking into account a multichannel service.

- Optimize the portfolio using forward-looking analytics: it is necessary to continually evaluate the multichannel portfolio by correlating sales performance with existing data to identify promising store locations based on population density, income, and competitors.

Industry 4.0 is the future, and more and more companies are investing in the digitization of their business processes. Digital solutions are taking lean operations to a new level. Through a cloud database, the company can access the performance and tracking management system, a set of models for assessing operational capabilities and improvement initiatives, and a platform for sharing best practices and collaboration in real time. In this way, supervisors can access internal company information to detect performance flaws, performance history, and compare metrics by product, site, and region. Staff members can submit suggestions for improvements and best practices in this cloud, making them feel more important and having a greater impact on the company (Fritzen et al., 2016).

According to Bahreini (2016), there are 4 trends in retail that are emerging and will shape the future:

- **Mobile shopping experiences:** mobile applications invite customers to consume products in a quicker and more direct way; the emergence of iBeacon enabled digital messaging to guide consumers to their favourite products and provide them with useful tips. On the other hand, through the mobile applications it is possible to provide a much more personal and faster customer service, by answering to doubts from the customers instantaneously.
- **Digital advertising:** retailers will start to electronically advise their customers about new products, promotions and interested articles based on the consumer history as they visit the store. This method will allow customers to be loyal due to the quality of customer service provided.
- **3D Holograms:** holograms will help consumers visualize the products that are coming to market soon. These holograms can be placed in strategic locations of stores, such as the counter and shop windows, to attract more customers. Also, smart shelves can alternately project various products that have great consumer impact, creating an attractive and impulsive buying effect.

- **Auto-checkout:** The introduction of automatic one-click remote payment methods will allow much faster and convenient consumer experience without the customer having to go to the physical store or personally contact a seller.

Many companies have adopted advanced analytical measures in manufacturing processes that have allowed them to create a competitive advantage over competitors: development in quality control, predictive maintenance and supply chain optimization. There are some digital tools that will allow continuous refining of company processes (Fritzen et al., 2016):

- Augmented reality tools: will provide data on the environment of users in real time and facilitate the sharing of information. This method allows the increase of speed of the operations, improvement of the communication and reduction of paper circulation.

- 3D printing: companies can use this technique to facilitate product design and sample production by reducing the number of hours needed to produce prototypes and consequently their costs.

- Connected sensors and controls: many companies have recognized the importance of the internet of things and invested in connected sensors, such as those that detect unusual machine vibrations and transmit the results to the monitors in a remote area, and the employees can solve the problem from a remote location.

Some companies have sought to adapt to these new trends, having opted for recent technology, or created innovation labs in areas rich in talent. On the other hand, the governments should promote digital production. In addition, large companies should seek partnerships with smaller companies or start-ups to gain the essential digital capabilities they miss (Fritzen et al., 2016).

2.3. Competitiveness of Modern Retail

2.3.1. How can retail companies keep up competitive adopting the Circular Economy approach?

Building a circular economy involves a lot of effort. Thus, it is important to develop 6 actions (Rossé et al., 2016):

- **Regenerate:** move to energy and renewable materials, regenerate the health of ecosystems and recover natural resources to the biosphere.

- **Share:** maximize the use of products through product sharing; reused throughout its useful life; prolong product life cycle through maintenance, repair and design.

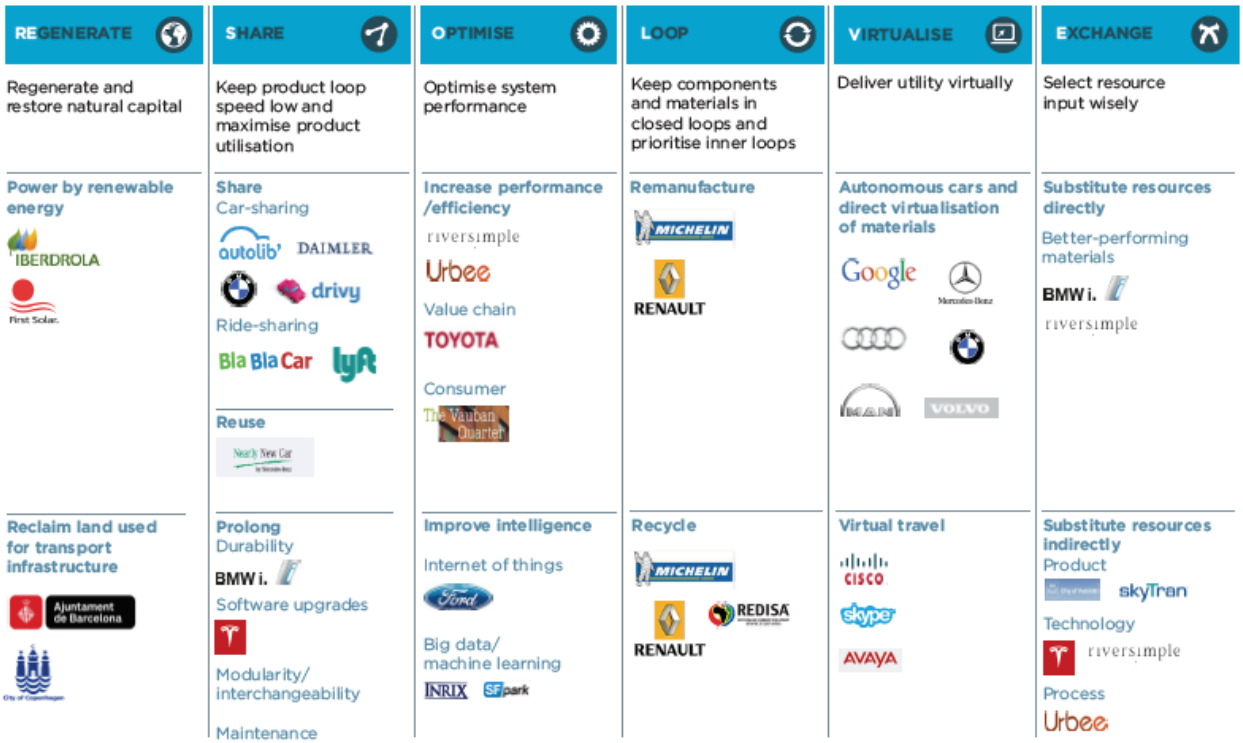
- **Optimise:** increase product performance and efficiency; remove waste from the supply chain and leverage automation and remote sensing.

- **Loop:** keep components and materials in closed loops and prioritize those already existing within the loop. In the case of finite materials, focus on remanufacturing and material recycling, as in Michelin, Rolls-Royce and Renault. In the case of renewable materials, it involves the anaerobic digestion and the extraction of biochemical products from organic waste.

- **Virtualize:** delivery of virtual products such as books, music and online shopping.

- **Exchange:** replace old materials with more advanced and renewable ones; apply new technologies like 3D printing and electric motors.

Figure 6 - The Six Actions to Build a Circular Economy



Source: McKinsey&Company 2015. Growth Within: A Circular Economy Vision for a Competitive Europe

According to Engel (et al., 2016), it is important to combine the following factors to be successful in the organization:

- **Economic Viability:** thriving recovery of resources. Recycling companies should have sufficient funds to invest in recycling and waste treatment techniques, so they can absorb as much material as possible. Companies also need to have access to quality raw materials in sufficient quantity.

- **Transparency:** key to building credibility with suppliers, partners, and facilitating government monitoring of environmental, health and social outcomes. This also allows producers to increase their efficiency and seek continuous improvement. Internally, it allows the company to adjust its treatment and management methods and allows its results to be reported frequently to the authorities.

- **Strong Management:** particularly in developed countries, stronger performance management, better waste treatment methods supported by analytical data have been observed, which help in strategic and operational decision making.

Plastics are the most used raw material in the world, since they are cheap, versatile and with apparent hardness, being therefore widely used in the packaging industry, health care, technology and transportation. According to ICIS studies, the use of plastics will increase worldwide at the rate of 4% per year between 2010 and 2025 (Stuchtey et al., 2016). However, the economy of plastics also has its drawbacks, since its production depends on non-renewable raw materials. On the other hand, about 95% of the value of plastic packaging - 80 billion to 120 billion dollars - is lost after being used only once. To make the plastics economy more circular, it is necessary to improve its reuse and recycling, and find other ways of making plastic products that do not require virgin materials, such as fossil fuels (Stuchtey et al., 2016):

- **Reuse:** reuse makes plastic products much more productive and useful. Although reused packages contain more material, the required material turns out to be much smaller than what is required on average over the life cycle of products. In the business-to-business segment, RFID-enabled plastic containers can make products easier to handle, better protected, and simplify inventory management. This could improve the logistics sector, helping to allocate the merchandise more cheaply on trucks, making multiple deliveries to different customers on a single trip. Some companies sell refill systems that allow consumers to mix tap water with ingredients concentrated in small packages, creating liquid soap and soft drinks that can be used multiple times. Some municipalities may also install some water sources that allow people to refuel.

- **Recycling:** the recycling of plastics sometimes is limited and inefficient, causing losses of about 60% of the raw materials value. Recycled plastics are intended for low value products, such as garbage bags. The problem is centred on the lack of global standards, and many types of packaging are produced in very small quantities, so recyclers can profit from this process. With a standardization of plastic and format materials, it would give more confidence to recyclers to invest in the recycling of these products. On the other hand, there are types of packaging such as plastic bottles, which are recycled on a large scale, and where recyclers are often willing to invest in the production of high quality recycled materials at competitive prices and in large volumes. By introducing new technologies for sorting and processing plastic waste, such as chemical and mechanical methods, could increase the variety of materials and improve the quality of recycled plastic.

Oil and gas make up more than 90% of the plastics industry's raw materials, including fossil fuel and aviation industry. Some solutions have emerged in recent years, such as

Nano printing, which allows to produce objects on a micron scale, and can be used to transform single and easily recycled materials into packaging that can be made through multiple materials. Also, some digital methods of manufacturing and distribution, such as the 3D printer for small batches, could change the companies' needs for plastic packaging. Shifting oil and gas raw materials to renewable resources, such as biomass from sustainable sources and captured greenhouse gases, are good alternatives to reduce fossil fuel consumption in industries (Stuchtey et al., 2016).

To transform the plastics economy, it is essential to establish a partnership between companies, government and non-governmental organizations that invest in innovation and exploration of new production methods. Thus, it is important to follow some suggestions (Stuchtey et al., 2016):

- Establish global standards: it is necessary to establish design, labelling, infrastructures and secondary markets standards. This would allow recyclers to produce uniform batches of products and would give confidence to plastic manufacturers to buy recycled plastics with properties that meet their needs.

- Develop economic and scientific knowledge: to study the socioeconomic impact of plastics in the oceans, how energy can be recovered from plastics that cannot be fully recycled, among other issues for the management of plastics in the long run.

- Collaborate on innovation: establish a partnership between companies and R&D, to seek for new technologies such as the inclusion of biologically benign plastics and multi material packaging that can be easily reprocessed.

- Engage policy makers: it is important to provide the government with updated tools and data to benefit from methodologies to assess barriers and opportunities in the transition to a new plastics economy.

Design thinking seeks to provide value to consumers with as little material as possible. The idea is often to provide services instead of products: think of a way for consumers to store their digital files in the cloud instead of a physical device. In the case of a physical device, the design leads companies to develop more durable devices with better material or allowing parts to be easily replaced in case of damage (Hannon et al., 2016).

In the clothing business, fashion is currently mass production and under precarious conditions. The textile industry usually requires the use of lots of water and chemicals emitting large amounts of greenhouse gases. On the other hand, today there is still great exploitation of children and workers in these industries, being poorly paid and exposed to precarious working conditions. Also, the raw materials used are often obtained in hazardous and impactful ways in the environment, as in the case of cotton, which is usually grown using a lot of water, pesticides and fertilizers. Industries rely primarily on fossil fuels for production, with an average production of 1 kilogram of tissue generating an average of 23 kilograms of greenhouse gases. In addition, consumers also play an important role when purchasing these products. Washing and drying 1 kg of clothing over its life cycle generates an average of 11 kilos of greenhouse gases. These consequences can be reduced by changing the way clothing is produced (Remy et al., 2016).

Some companies have begun forming partnerships to help mitigate and reduce the impact of their industries on the environment. 22 apparel companies formed a partnership called *Zero Discharge of Hazardous Chemicals* to improve and expand the use of sustainable non-toxic chemicals in textiles and footwear. H&M and Levis have partnered with I:CO to collect clothing and footwear for reuse and recycling. I:CO provides collection safes, sorts the products that are in good condition to sell, and the rest is recycled. In addition to collecting used clothes, Patagonia also offers repair services for both clothes to increase the life of the products. Knowing the environmental impact of cotton farming, C&A intends to only buy organic cotton by 2020 (Remy, 2016).

According to Remy (et al., 2016), there are a few other measures companies can take to reduce the impact on the environment:

- Develop standards and practices to identify garments that can be reused and recycled, and what impact their life cycle has on the environment.

- Invest in R&D for the development of new fibers for the manufacture of clothing and footwear that reduce the harmful effects on the environment.

- Encourage consumers to adopt practices that are less polluting while wearing their clothing, such as not washing clothes with very hot water, not drying too hard or too long.

- Support the development of chemical and mechanical recycling technologies.

- Establish higher environmental and labour standards for suppliers and make supply chains more transparent. Some companies are providing a tracking system to their consumers, so they can access the process of manufacturing their products from the raw material extraction till home.

- Provide suppliers with guidance and resources to meet new labour and environmental standards and hold them accountable for disabilities in performance. Walmart, for example, has made a commitment until 2017, 70% or more of the products it markets, will come from sellers who have energy management planning. The company offers its suppliers software tools to help them find opportunities to use energy and resources more efficiently.

Becdach (et al. 2016) also considered that there are other strategies that can be implemented for success:

1 - Focus on the "core" of the organization: in order to reduce the costs of companies, many managers end up focusing on non-essential company activities, while the core of the company is forgotten and does not progress. Companies must prioritize their essential functions.

2 - Play favourites: not all parts of the business should have the same cost reduction targets. The best technique is to determine different targets for cost reduction and investment levels based on unit growth and potential efficiency. Leaders must also define capabilities that are critical to growth and invest in them while leave other areas that are not so profitable.

3 - Ask for bad ideas: cost-cutting initiatives are more likely to be successful if employees are free to be creative and think "out of the box" and can make suggestions that sometimes seem ridiculous. When leaders are the first to have the freedom to come up with different ideas, they encourage their employees to do the same.

4 - Move beyond benchmarks: benchmarking may be important for firms to have a sense of, for example, the number of workers their competitors have in each department, or to know in which areas their competitors are mostly investing, in order to increase the companies' operations efficiency.

5 – Skip meetings and stop writing reports: leaders must take an important position in determining which activities to stop, which ones to change, and which ones to continue. Some studies have found that companies spent much of their time preparing long-lasting meetings, involving many people and large costs, and often ending up with no clear idea of what to do. In this way, some companies began to reduce the number of meetings and the frequency with which they were carried out, and to approve certain measures by email or telephone call.

In emerging markets retailers have found another reality. Consumers were not so busy buying and living in urban areas, many did not own their own car, nor could afford to travel to a relatively distant hypermarket, and some did not have enough room at home to store large quantities. In these markets, consumers are accustomed to cooking their own meals, and shopping in open malls such as the markets, or in smaller and more familiar neighbourhood retailers. On the retail side, the main feature is the informality of the business: many of these deals belong to family and friends, and therefore the pay is sometimes low; sometimes they do not pay space rent and may do pay taxes. This becomes a major point of disagreement for modern retailers because they do not consider fair competition (Child, 2015).

According to McKinsey & Company (2015) research, seven strategic actions for retail success can be considered:

1 - Priority proximity: urban consumers who have low incomes and small houses, usually prefer to shop frequently and in small quantities, and for immediate consumption or to save for a short time.

2 - Keep pricing lows: Discounter retailers that are characterized by low prices, limited product range, low cost modernization of stores and simple operations, are often more successful than supermarkets. When Discounters are the first to open in an urban area, they may be the first to determine price expectations.

3 - Obsess over productivity: In markets where labour costs are low, it is difficult to maintain high levels of productivity.

4 - Make the business case to manufacturers: an obstacle to the expansion of the emerging markets business, is the fact that producers that are already established do not

have many incentives to negotiate with modern retailers. To bring both parties closer, it is important that modern retailers try to approach their suppliers through creative, collaborative and mutually beneficial strategies. An advantage to these retailers is that suppliers prefer to supply retailers in emerging markets such as Discounters, since in the markets where they dominate consumers can switch to private label products.

5 - Educate policy makers on the benefits of modern trade: Governments can play an important role in how modern commerce develops. This support may arise in the form of construction of new infrastructures, such as new highways, urban planning for traffic management, and new parking areas.

6 - Considering partnering with the traditional trade: a growth strategy for modern retail, it is about creating partnerships with traditional commerce. These partnerships would allow the modern retailer to leverage the customer network and customize the traditional commerce service while minimizing investment capital.

7 - Adopt a city-based strategy: When a market is at an early stage of development, national borders can be very useful in developing the business network. In this way, these flaps should focus on their development in certain cities, or in certain groups within cities.

Some stores, such as C&A, are developing their business based on their production of organic cotton clothing, and without the use of synthetic chemicals or genetically modified seeds. In the case of Puma, some waste reduction policies have been adopted, having already reduced water and energy consumption and carbon emissions by 25% since 2010 (Berg et al., 2015).

Companies must follow 4 principles for success: selecting some areas of focus, determining measurable goals, conducting cost-benefit analyses, and creating incentives for employees and suppliers. Companies should identify the number of areas they focus on, usually between 3 and 5 to avoid dispersion of efforts. The objectives should also be clear and realistic and should be transmitted internally and externally (Berg et al., 2015). Determining quantitative goals motivates the team and forces leaders to allocate resources. In the case of incentives, one of the examples that Nike is giving is that it directs its business primarily to suppliers who receive the highest score in the *Sustainable Production and Supply Index*. This is a tool that Nike uses to evaluate the sustainability,

cost, quality and delivery time of its suppliers. If retailers knew timely the number of employees and skills required for each store, customers would have a much better service, shelves would be replenished in good time, employees would not overwork, and employee costs would decrease (Berg et al., 2015).

3. Methodology

3.1. Research Context

As already mentioned, this dissertation intends to analyse the evolution of retail, and how companies can keep competitive by adopting good environmental and ecological practices. The objective is to analyse and assess the current or short-term methods practiced by companies operating in Portugal regarding the reduction of the ecological footprint and the impact of their processes on the environment and to understand if it is possible to remain economically competitive using other types of raw materials and commercial techniques.

For a research development, qualitative, quantitative or mixed data can be used. Qualitative data are mainly exploratory, allowing a deeper understanding of theory, opinions or ideas. The methods used to obtain qualitative information can be through group discussions, individual or observation interviews, and the sample size is usually small and segmented. In the case of quantitative data, it is obtained through the generation of numerical data, and is subsequently converted into statistics that inform the trend of the study to be performed. To collect this data, it can be conducted by personal or online interviews, surveys on various platforms and through observation. Mixed data is a combination of these two sources of information.

This research had a qualitative methodological approach, through the collection of information based on bibliographic reviews and an empirical study using business interviews. A qualitative study allows a deeper understanding of the subject through more elaborate and sustained analyses.

Thus, this dissertation is based on an exploratory, descriptive and content analysis research.

3.2. Data Collection

For the collection of information in this dissertation, Primary and Secondary Data were used. In the case of Primary Data, interviews were carried out in the Jerónimo Martins group, Sonae, Os Mosqueteiros, Aldi and Auchan.

Regarding Secondary Data, research was carried out on some online platforms such as B-ON, Google Academic, SCOPUS and through the "Guia das Boas Práticas Ambientais" published by APED, which shows all the actions and measures practiced by some companies, nowadays, for a healthier environment free of chemical compounds.

The following passwords were used to obtain the survey's results: Circular Economy, Polluting Raw Materials, Natural Resources, Sustainable Development, Techniques to Reduce Ecological Footprint, Traditional Retail vs. Modern Retail, Trends in Retail, How Companies Keep Competitive Through a Circular Economy Approach.

This research was developed between October 2017 and August 2018.

3.3. Research Design

In this research, the main retail brands such as Pingo Doce (Jerónimo Martins), Modelo Continente (Sonae), Intermarché (Os Mosqueteiros), Auchan and Aldi were selected as targets for this dissertation (Lidl and Dia Minipreço were also contacted but declined the invitation). Then, a company interview guide was developed, which included 10 questions aimed to understand the techniques implemented in the companies to reduce toxic gas emissions and environmental contamination, as well as the concerns raised by stakeholders who are involved daily in the business. The objective is to understand how the biggest players in the retail market in Portugal are currently positioning themselves in accordance with the sustainable needs and obligations that companies must have today, in order to adapt their business processes and methodologies to a circular economy, free of chemical compounds and polluting surpluses.

3.4. Data Analysis

Once all the necessary information has been gathered, a content analysis will be carried out to understand the methods already implemented by the companies to reduce the ecological footprint and their adoption of circular economy, and how they remain competitive in the market. Each question will be compared with each company's responses, trying to assess levels of commitment to the environment and the circular economy, and if they are in accordance with the trends that some countries already adopt internally.

4. Results Analysis and Discussion

For the results analysis, a survey was carried out to 5 companies: Jerónimo Martins, Sonae, Os Mosqueteiros, Aldi and Auchan. The survey is composed by 10 questions, which assess the commitment degree of companies with the sustainability of the environment, the raw materials used, and the processes adopted in the marketing of their products. The script is composed of the following questions:

1 - What types of environmental concerns are reflected in your company's processes?

2 - Do you care about involving stakeholders in sustainable decision-making?

3 – Do you seek for suppliers who adopt sustainable policies in their extraction processes and production methods even if it involves higher costs?

4 - Given the period of extreme drought that has plagued our country in recent months, what measures have been implemented to save water?

5 - Is it possible for consumers to return purchased and end-of-life products to your stores? What treatment do they have?

6 - What measures do you take to avoid waste and to reuse surpluses?

7 - Is there concern in the materials used for the packaging of the products? Is ecodesign present in your routines?

8 - How is the cargo stored in the transport vehicles?

9 - Since we are walking in the Digital Era, how has your communication with the client been adapted in this area?

10 - What sustainable measures do you intend to implement in the near future?

After conducting the interviews, and consequently collecting information, the answers given by the companies for each question were grouped.

1 - What types of environmental concerns are reflected in your company's processes?

Jerónimo Martins: Some measures have been taken in recent years to reduce the ecological footprint in the various processes of the company:

- Replacement of gases with a lower GWP (Global Warming Potential) and less impact on the greenhouse effect.
- Commercialization of seafood and fish under the Marine Stewardship Council (68.8% of frozen hake marketed by Pingo Doce was caught in South African waters by vessels that meet MSC certification standards).
- Canned tuna with Dolphin Safe label, ensuring there is no accidental catch of dolphins
- Fruit and vegetables certified by an independent external body (Ecocert) bearing the European Union logo, and ensuring compliance with the Community Regulation on Organic Farming
- Launch of 5 references with UTZ certified cocoa, which proves the use of raw materials obtained according to a sustainable agriculture model.
- Launch of ecological detergents and cleaning products Ultra Pro, and subsequently added another 3 references with the EU Ecolabel certificate.
- Technical Standard of Environmental Management, which allows guiding in the continuous improvement of the intended environmental performance for the suppliers
- The company exceeded the target of reducing the carbon footprint by 5% between 2012 and 2014.

The Environmental Management System implemented at the Jerónimo Martins Distribution Centers is based on the international standard ISO 14001:2012, with the centres of Azambuja, Vila do Conde, Algoz and Alfena being certified, out of a total of seven. In Poland, 15 of the 17 Distribution Centres have the same certification, ensuring that more than 70% of the Group's centres are certified by this standard. Over the next three years, the goal is to increase the number of establishments with this certification to 25. In 2017, all Polish Distribution Centres renewed their certification for the handling of organic products, in accordance with Regulation EC 834/2007. In addition, the Group carried out internal audits in stores, warehouses and Distribution Centres to ensure compliance with legal requirements and internal Environmental Management procedures. In 2017, 299 audits were carried out, both in Portugal and Poland.

The Group assesses the risks associated with different ecosystem services based on the Ecosystem Services Review methodology proposed by the World Research Institute,

defining actions to guide management projects and practices, including: (i) information management; (ii) training; (iii) partnerships with suppliers; and (iv) research and development. This analysis made it possible to assess the level of exploitation of stocks, impacts on ecosystems and surrounding communities, traceability and working conditions, and concluded that none of the species traded were at high risk. In 2017, the Group assessed the degree of vulnerability of all fish species traded in Portugal and Poland. This analysis was based on the IUCN Red List of Threatened Species and resulted in the discontinuation of commercialization of the species classified as "Critically Endangered", for which it was not possible to ensure the production, throughout the entire life cycle, of aquaculture. In agriculture, and after conducting a study on the practices of fruit and vegetable suppliers in Portugal, a manual was developed to promote the use of production methods that promote the protection of biodiversity. In 2017, the methodology of the manual was applied to 40 farms from 25 suppliers of the Group, and the overall sustainability index was determined for each one. It is intended that this project will be extended to suppliers in Poland and Colombia in the coming years.

In 2017, the carbon footprint was 1.208.592 tonnes of carbon dioxide equivalent, a decrease of 4,6% compared to 2016, which is mainly due to the significant reduction of market-based emission factors associated with the consumption of electricity. For the same reason, the specific value decreased from 0,0867 to 0,0743 tonnes of carbon equivalent per thousand euros of sales.

Table 1 - Carbon Footprint Indicators

Carbon Footprint - Indicators	**2017**	**2016**	**Δ 2017/2016**
Global Value (scopes 1 and 2) - t CO2 e (1)	1.208.592	1.267.496	-4,60%
Specific value (scopes 1 and 2) - t CO2 e/000 €	0,0743	0,0867	-14,30%
Carbon Footprint - Indicators	**2017 (t Co2 e)**	**2016 (t CO2 e)**	**Δ 2017/2016**
Global Carbon Footprint (scopes 1 and 2)			
Portugal Distribution	263.207	339.515	-22,50%
Agrifood	2.465	2.697	-8,60%
Poland Distribution	911.490	912.332	-0,10%
Colombian Distribution	31.430	12.952	142,70%
Carbon Footprint - (scope 1: direct impacts)			
Leakage of refrigerant gases	146.482	157.794	-7,20%
CO2 utilization	18.904	18.007	5%
Fuel consumption	56.074	59.053	-5%
Fleet of light vehicles	16.451	15.074	9,10%
Carbon Footprint - (scope 2: indirect impacts)			
Electricity consumption (location-based)	825.710	779.842	5,90%
Electricity consumption (market-based)	950.687	995.050	-4,50%
Warming (location-based)	19.994	22.518	-11,20%
Carbon Footprint - (scope 3: other indirect impacts)			
Transport of goods to stores (distribution)	164.532	155.867	5,60%
Landfill	36.912	19.980	84,70%
Waste incineration	221	-	N/A
Composting of organic waste	120	432	-72,20%
Energy consumption in franchise stores	15.685	16.697	-6,10%
Airline airplane trip	1.804	1.970	-8,40%

Source: Adapted from Jerónimo Martins Relatório & Contas 2017

(1) Scope 2 emissions are based on location-based (heating) and market-based emission factors, as shown in the table "Carbon Footprint - Indicators".

Note: The calculation of the carbon footprint of the different activities follows the methodology proposed in the Greenhouse Gases Protocol of the World Business Council for Sustainable Development (WBCSD), at its three levels: direct, indirect and third-party impacts. The figures presented took into account emission factors defined by the Intergovernmental Panel on Climate Change (IPCC) for refrigerant gases, by the Directorate General of Energy and Geology in Portugal, by the Unidad de Planeación Minero Energetica (Planning Unit (The Polish Center for Balance and Emission Management for Fuels and Warming), the International Energy Agency, suppliers (electricity), the Greenhouse Gases Protocol (fuels used in the fleet transport and air travel) and UK Government GHG Conversion Factors for Company Reporting (waste).

Sonae: Modelo Continente carries out its activity in compliance with Sonae's Environmental Policy, first published in 1998 and revised in 2004 and 2009 (http://sonae.pt/en/sustentabilidade/principios/better-planet/).

In addition, Sonae's Retail Area has Environmental Certification in accordance with the International Standard ISO 14001, granted by Lloyd's Register in 2007, which involves annual audits of 55 facilities: 26 Continentes, 8 Continentes Modelo, 2 Continentes Bom Dia, 12 Worten (3 in Spain), 6 warehouses and 1 Meat Processing Centre.

Subsequently, Sonae bet on the development of the Environmental Management System, in order to comply with the 17 requirements imposed by ISO 14001 standard. This system was later audited and certified by APCER in the Cascais hypermarket and the Entreposto da Azambuja.

In order to become a reference of environmental concerns transversal to all areas of the company, Sonae implemented the LEED Reference Framework - Leadership in Energy and Environment Design, with the objective of build a building that is considered an example of ecoefficiency. This reference focuses on 5 points:

- Energy & Atmosphere - use of energy supplied by the cogeneration plant and the appropriate design to the climate; efficient energy systems.
- Water Efficiency - use of low consumption equipment; reuse of "grey" water resulting from lavatories / showers to be discharged into urinals and toilets; recovery of rainwater for irrigation and washes of zones and technical equipment.
- Materials & Resources - reuse of building materials; recycling of materials generated during the construction phase, but not used in the construction; use of wood from sustainable production; use of paints, varnishes and carpets with low content of Volatile Organic Compounds; use of sand, brittle and cement of regional origin; use of glass, steel and gypsum boards incorporating recycled material.
- Sustainable Sites - implementation of erosion and sedimentation control plan; implementation of a shuttle system for employees between Maia Business Park and the public transport network; implementation of a space dedicated to eco-efficient vehicles in the car park of Maia Business Park.
- Indoor Environmental Quality - natural light and exterior view; implementation of an Inner Air Quality Plan.

Os Mosqueteiros: Publication of the "Guia de Desenvolvimento Sustentável" in order to control energy consumption and establish a sustainable development policy at points of sale.

Subsequently, "Programa Origens" was launched, establishing a specification for each producer / product, which includes all the criteria that must be met (rational management of natural resources, respect for good agricultural practices, use of regulatory mechanisms in substitution of production factors).

The group has been committed to progress in the field of energy efficiency from 2013 onwards. The Energy Efficiency Plan aims to reduce overall energy consumption by 30% by 2020 compared to 2014 and increase the renewable energy use by 10% (reducing their dependence on fossil fuels).

In 2016, the 44 logistic bases and 14 production units of the Agromousquetaires group were certified under the ISO 50001 standard. This energy management standard certifies the quality of the organization applied by these entities to effectively manage energy and respond to global warming.

At Alcanena's base, the installation of new cold storage units has reduced electricity consumption by about 25%, although the refrigerated surface has increased by almost 2500 m². The lighting equipment has made it possible to increase this energy saving thanks to an automatic needs management system and LED lighting installation. An identical policy was implemented in Paços de Ferreira, with the partial replacement of the indoor lighting by LED lighting and the R22 gas by the R422D in the case of the plant for the storage of deep-frozen products.

Aldi: Establishment of several sustainable policies and standards in recent years, aimed at improving the processes of acquisition of raw materials and production of materials:

- Fish Purchase Policy for the sustainable acquisition of fish and shellfish
- International Cocoa Purchase Policy, to develop sustainable cultivation and improvement of working conditions for farmers
- International Palm Oil Purchase Policy, to promote a sustainable cultivation of palm trees
- International Coffee Purchase Policy for the supply of certified sustainable coffee products

- International Animal Welfare Policy, through audits, control, transparency and traceability.
- International Wood Purchase Policy for all national and international own-brand articles ALDI Nord, articles of own consumption, as well as publicity materials composed of the following materials:
  - Wood
  - Paper
  - Viscose fibres;
  - Bamboo.
- Environmental Textile and Footwear Production Standards, supporting the Greenpeace Detox campaign which aims to reduce the impacts on people and the environment of production processes using chemicals in the textile and footwear industry
- Establishment of the Agreement on Fire Protection and Building Security in Bangladesh to ensure the improvement of workplace safety

Aldi has developed other measures to improve civic behaviour daily:

- Placing of ecopoints for the separation of waste in stores, offices and logistics warehouse.
- Use of returnable cartons for fruits and vegetables
- Installation of photovoltaic panels

The Group has also established partnerships to ensure compliance with safety and human rights standards at work and to enable organic and sustainable raw materials to be obtained:

- Member since 2008 of the AMFORI association, which corresponds to a code of conduct on working conditions and human rights. This association frequently audits ALDI in order to assess whether the company meets the established criteria. The ALDI Factory Advancement project was also created to improve working conditions in textile factories.
- Support for Fair Trade through incentives to producers in Asia, Africa and South America so the production costs are always covered, and support is also provided for the construction of infrastructure and investments in population health.
- PRO PLANTEURS project, which provides access to cocoa-growing land in Côte d'Ivoire
- Marketing of bed linen and textiles according to the Fairtrade Standards, confirming that the cotton used provides 100% of farms that meet the requirements of the organization in the ecological, economic and social spheres.
- Extension of the certification of cotton bed linen and undergarments in accordance with the Global Organic Textile Standard, guaranteeing the biological cultivation

of fibres, sustainable production in environmental and social terms, as well as the uniform identification of the products.

- Partnership with Organic Content Standard 100 (OCS 100) and Organic Content Standard blended (OCS blended), allowing companies to accurately record the percentage of organic raw material used. The standard is defined by the Textile Exchange (TE) organization and is based on the TE Content Claim Standard (CCS) chain of custody requirements.

Auchan: Creation of the project “Zero Waste" which includes:

- Training of employees.
- Awareness of customers - through campaigns that aim to take advantage of leftovers.
- Donation of end-of-life products, within the validity period, to “Dar e Acordar” and “Re-Food” partnerships.
- Bet on loose products to adapt supply to consumer demand, and reduce the price of products close to the expiration date
- Rigorous Operational Management, through the implementation of procedures and rules to minimize waste.
- Launch of a website dedicated to sustainability issues (www.responsavel.jumbo.pt)

Auchan Sustainable Fish Trade Policy:

- Selection of the best purchase options
- Ensure that suppliers comply with the sustainability rules established by Auchan
- Training of employees
- Monitoring of supply and purchase indicators
- Establishment of a cooperation protocol with the Leiria Polytechnic Institute, School of Tourism and Technologies of the Sea (research unit), for technical support to evaluate the sustainability of fish
- Sensitization of the client, with campaigns of positive discrimination of the fish, i.e., valorize the most sustainable resource, and with valorization of the national fish.

Auchan has been investing in promoting a healthy eating style through several biological launches:

- Vida Auchan Qualidade Sustentável are products fully framed with the concept of Sustainable Agriculture, with respect for the environment, animal welfare, social development and traceability. They are controlled from the producer to the consumer, with a process of total partnership with the producers.

- Lavera range of organic cosmetics, with face cream (care and cleaning); body and hand creams; deodorant; shower gel; and by 2017 the Hair segment. This is a 100% natural and biological certified range, free of GMO ingredients and exemption of synthetic mineral and vegetable oils.
- New range of Björnsted chocolates, with exclusive raw materials originating from ecologically sustainable plantations in Ecuador, Panama and the Dominican Republic, and without the use of emulsifiers or other additives.
- Enlargement of poultry products, such as soybeans, flax seeds and bird flakes, with an alternative to plant extraction.
- New range of organic bread with new references from Miolo Bakery. Among these articles are the varieties of Carob, Sweet and Corn, Whole Oats, Spelled Rye, Integral Rye and Low Carb.

Auchan has an effective interaction with responsible energy consumption. All refurbishments and new stores are covered by the Consumption Reduction Project, which all measures implemented are sustainable in the lighting area, refrigeration, air conditioning and renewable energies.

The group is the unique company in Portugal certified in Social Responsibility SA8000, contributing to the improvement of professionalism, well-being and internal satisfaction.

2 - Do you care about involving stakeholders in sustainable decision-making?

Jerónimo Martins: The Group considers that stakeholder engagement is a relevant step in the identification and management of environmental, social and economic aspects and should therefore be included in its strategy of action and communication. In order to ensure continuous improvement, the Group uses different communication channels to promote a better alignment with the needs and expectations of its stakeholders, such as the corporate website, reports of accounts, semi-annual corporate magazine, financial announcements, conferences, emails and direct contacts.

Jerónimo Martins bases its form of communication with stakeholders as follows:

- Provide business partners, shareholders, analysts, employees and the media with all necessary, transparent and rigorous information.
- Equitable treatment of shareholders.
- Ensure that the Group's website contains all relevant public information for its shareholders and other stakeholders.

Sonae: Concern to periodically listen to the main Stakeholders on the Environment aspects (Employees, Clients, Suppliers, NGO's, Associations representative of civil society sectors) whose results are considered in the orientation and development of our work. The last major auscultation was performed at the end of 2016.

Os Mosqueteiros: Establishment of a partnership with Trace One to optimize procurement, accelerate the development of private label products and facilitate relationships between suppliers and quality service. In 2016, 117 suppliers (53%) joined this platform.

Implementation of the logo "Programa Origens" in 1999, promoting the national fresh products commercialized, supporting the national production. The 170 producers that make up the program produce more than 200 references, totalling in 2016, 50.000 tons of merchandise. These products represent 16.5% of sales in its category. In this way, the group seeks to involve national suppliers in the production and supply of products, guaranteeing customer satisfaction.

Aldi: In order to keep trust and transparency among all stakeholders, Aldi has committed itself with its clients, partners and business partners to act responsibly and sustainably and to enable a transparent view of the modus operandi of the company's processes. Thus, the group decided to share with its stakeholders all relevant production sites for garments, home textiles and footwear from private labels. In addition, there is a constant concern that the parties involved know all the processes of acquisition, transformation and commercialization of their products, enabling a healthier and more genuine relationship among all stakeholders.

The most significant stakeholders for the group are the clients, employees, non-governmental organizations (NGOs), initiatives and associations, suppliers and business partners, as well as committees of workers and trade unions. There are also other important stakeholders such as the media, politicians and local residents. Aldi seeks dialogue with the following stakeholders on a regular basis:

- Customers have their own media available such as "ALDI Actual" and the web pages.
- Employees of the business group are informed through different means, such as circulars.

- Dialogue with NGOs and other organizations, especially through sectoral and multilateral initiatives. Representatives of the ALDI Nord are actively involved.
- Dialogue with suppliers, also to make the supply chain more sustainable.
- To prepare the report, information is exchanged with employees, suppliers and a workers' committee. In addition, more than 800 requests for information from clients, media and NGOs are evaluated.

Auchan: The group recognizes the importance of all its stakeholders as key elements for the continuation of its activities and for the definition of the sustainability strategy. The identification of Auchan's main stakeholders was based on criteria of responsibility, influence and dependence, in accordance with the AA1000 Stakeholder Engagement Standard. The company seeks to involve stakeholders to understand their needs, aspirations and build together the most appropriate actions.

In the commitment made by the company to establish a transparent, fair and winning relationship with all its stakeholders, the Ethics Committee is also responsible for complaints or whistle blowing from these interested parties. Thus, it is responsible for guaranteeing the confidentiality of the data and the protection of the people involved, responding to the messages addressed to them and triggering the defined procedures.

3 – Do you seek for suppliers who adopt sustainable policies in their extraction processes and production methods even if it involves higher costs?

Jerónimo Martins: The Group favours the development of long-term relationships and cooperation with its producers and suppliers, which involve technical follow-up, support in process optimization and/or guarantee of product disposal, thus stimulating local economies. In Portugal, the following initiatives are highlighted:

- In 2017, Pingo Doce developed a partnership with a local supplier to make available in its stores the product "Maçã das Beiras", of Portuguese origin, having commercialized more than 1000 tons;
- The Group maintained its partnership with a fishermen's cooperative in the Sesimbra area for the fishing of black scabbardfish, ensuring quality and price competitiveness, as well as the practice of traditional fishing gear, sustained regeneration of the species;

- A 100% national pig promotion campaign was launched in July in about 40% of Pingo Doce stores in order to promote local production.
- In 2017, Pingo Doce maintained the support for Portuguese producers of Perishable products with whom it works, and which are members of the Confederação de Agricultores Portugueses (CAP). This measure consists of the anticipation for an average of 10 days (instead of the 30 days imposed by law) of the payment period practiced by Pingo Doce, without financial costs for the producer. Since its creation in 2012, about 500 producers have benefited from this initiative in the categories of Fruit, Vegetables, Meat, Fish, and Wine.

The Group regularly audits its Perishable and Private Brand suppliers in order to assess and monitor the management and control of processes, the quality system implemented, the formulation of products and the labour and environmental aspects. The supplier assessment also includes environmental requirements, such as the criteria associated with water management, liquid effluents, waste, air emissions, noise and hazardous substances. The Group also assesses occupational health and safety conditions and training. These requirements include criteria such as the existence and use of appropriate clothing, handwashing equipment, rules of conduct and personal hygiene, existence and conditions of social areas, changing rooms and sanitary facilities for employees.

It was also established a Code of Conduct, which provides for the termination of business relations with suppliers whenever there are practices of abuse of human rights / workers and do not incorporate ethical and environmental concerns in the performance of their duties.

Table 2 - Audits to Perishable and Private Label Suppliers

	2017	**2016**	**Δ 2017/2016**
Portugal			
Perishable	921	847	9%
Own Brand (Food and Non-food)	259	244	6%
Poland			
Perishable	357	376	-5%
Own Brand (Food and Non-food)	446	451	-1%
Colombia			
Perishable	57	56	2%
Own Brand (Food and Non-food)	150	165	-9%

Source: Adapted from Jerónimo Martins Relatório & Contas 2017

In the case of foreign suppliers not covered by the internal auditing system, the Group requires a Food Safety certification recognized by the Global Food Safety Initiative, namely the British Retail Consortium (BRC), Global Good Agricultural Practices (GAP), HACCP / Codex Alimentarius or ISO. All new suppliers of Private Label and Perishables products must be audited in accordance with the internal criteria of the Group (common to the three geographies in which operations are carried out). In the case of suppliers not located in these countries, they must be certified according to the BRC, International Featured Standards (IFS) or Food Safety System Certification (FSSC) 22000 standards.

Sonae: Its mission is to be able to provide customers with the best products at the best prices, considering the application of acceptable production methods from all points of view (from Human Rights, Labor Conditions, compliance with legislation to which they are subject, including environmental).

They assume Suppliers as business partners. Therefore, the way of acting in relation to Suppliers is mainly inclusive, giving them knowledge about consumers' preferences, encouraging them to produce better products through acceptable methods.

Thus, when they detect fewer positive situations in the audit and control processes carried out - as long as they are not totally unacceptable (such as child labor, non-compliance with applicable legislation) - the action is to clarify and encourage the correction of these situations before suspending the relationship.

Their role in the "Clube de Produtores Continente" is a good example of this position, making the national producers develop and having conditions not only to supply the domestic market, but also to compete in demanding international brands such as in the European area.

The Fishery Sustainability Policy (http://sonae.pt/pt/sustentabilidade/principios/better-purpose/) is also an example of how they operate.

Finally, the supply contracts include as an attachment the Environmental Policy, with a clause that clearly specifies that the performance of the Supplier cannot jeopardize compliance with the Environmental Policy.

Os Mosqueteiros: Establishment of a partnership with suppliers based on 3 tools:

- Signature of a quality protocol and "Responsible Supplier" for 3 years
- Platform for evaluation and monitoring of suppliers in their sustainable policy
- Training actions for employees on social and environmental issues

Subsequently, they developed the Responsible Procurement Protocol for Suppliers based on the recommendations of the ISO 26000 standard on corporate social responsibility. After signing this protocol, suppliers adopt 15 commitments on:

- The environment (management of water, waste, biodiversity, CO2 emissions ...);
- Governance (fair practices and business ethics);
- Territorial presence;
- Social practices (health and safety at work, commitments to diversity ...).

They commit to combat deforestation by ensuring that suppliers of palm oil, exotic wood, cocoa, coffee and charcoal follow a sustainable and concerted production logic. They also work with the NGO “The Forest Trust” (TFT) to track the production of palm oil to ensure that 100% is cleared of deforestation through traceability to the first importer by 2020. Currently 70% of the palm oil used in the group's own brand products is tracked and sustainable.

Aldi: Partnership with certified suppliers with internationally recognized industry standards, where products have a quality seal and guarantee of independent verification entities.

Auchan: Audits are performed annually to suppliers to safeguard compliance with the Code of Ethics and Conduct by Suppliers, Subcontractors and Partners.

Support to local production and Responsible ranks (Vida Auchan Qualidade Sustentável products), simplifying the process of contracting local / national suppliers; realization of commercial actions in store. By 2025, the group wants 100% of national branded suppliers to be audited in the context of social responsibility.

Regarding supplier follow-up, they have 86% of the product suppliers with the Code of Ethics and Conduct signed and integrated the social audits, in the monitoring already carried out by quality management, to their own brand suppliers. Thus, these suppliers, such as direct importers, are audited upon entry into the company and every 3 years thereafter. They currently have 44% of their own brand suppliers with social audits

already carried out. They also audit suppliers in case of complaints or for risk management reasons. In 2016, we audited a total of 39 suppliers.

4 - Given the period of extreme drought that has plagued our country in recent months, what measures have been implemented to save water?

Jerónimo Martins: Biedronka, Pingo Doce, Recheio and Ara have been implementing efficient control systems for cold storage, more efficient technologies in terms of lighting (LED, skylights and photoelectric cells), refrigerated furniture and freezers with doors and covers and, also, systems of independent energy management. Other measures, such as the installation of flow reducers, taps with timers and regulation sensors for ice machines, have also been implemented. Over 65 million euros were invested in these measures in the last four years, having prevented the emission of more than 65.000 tonnes of carbon and has a return period of less than 5 years. The "Teams for Water and Energy Consumption Management", a project started in 2011 in Portugal stores, achieved a reduction in consumption of 357.700 m3 and 36.565.800 kWh in seven years. This project generated accumulated savings of more than 4,4 million euros.

Regarding office buildings, the Let's Go Green project, which covers six locations in Portugal, allowed a reduction in electricity consumption of 344.900 kWh between 2015 and 2017. Regarding water consumption, there was an increase of 209 m3, justified by the 28% increase in the number of employees present in these locations. When converted to water consumption per employee, there is a reduction of around 2 m3 per employee in the same period. It is the Group's objective to progressively extend these projects to other countries.

Table 3 - Energy Consumption

Total Consumption	**2017**	**2016**	**Δ 2017/2016**
Energy Consumption			
Absolut Value - Gj	6.634.950	6.488.383	2,30%
Specific Value - Gj/000 €	0,408	0,444	-8,10%
Energy Consumption by Business Unit			
Portugal Distribution - Gj	1.997.887	1.943.772	2,80%
Poland Distribution - Gj	4.184.639	4.327.971	-3,30%
Colombia Distribution - Gj	419.569	184.296	127,70%
Agrifood - Gj	32.855	32.344	1,60%

Source: Adapted from Jerónimo Martins Relatório & Contas 2017

Table 4 - Water Consumption

Total Consumption	2017	2016	Δ 2017/2016
Water Consumption			
Absolut Value - m3	2.780.958	2.513.756	10,60%
Specific Value - m3/000	0,171	0,172	-0,60%
Water Consumption by Business Unit			
Portugal Distribution - m3	1.767.613	1.630.890	8,40%
Poland Distribution - m3	813.818	735.383	10,70%
Colombia Distribution - m3	105.994	66.454	59,50%
Agrifood - m3	93.533	81.029	15,40%

Source: Adapted from Jerónimo Martins Relatório & Contas 2017

Increases in water and energy consumption are due to the expansion of operations (increase in the number of stores and other infrastructure) and, in Poland, to investments in Perishables.

Table 5 - Water Extraction by Source

Total Consumption (m3)	2017	2016	Δ 2017/2016
Total Water Consumption (m3)	2.780.958	2.513.756	10,60%
Municipal Network	2.598.057	-	-
Subterranean Water	181.787	-	-
Other Sources	1.114	-	-
Water Consumption by Business Unit			
Portugal Distribution	1.767.613	1.630.890	8,40%
Municipal Network	1.590.621	-	-
Subterranean Water	175.878	-	-
Other Sources	1.114	-	-
Poland Distribution	813.818	735.383	10,70%
Municipal Network	813.818	-	-
Subterranean Water	0	-	-
Other Sources	0	-	-
Colombia Distribution	105.994	66.454	59,50%
Municipal Network	105.994	-	-
Subterranean Water	0	-	-
Other Sources	0	-	-
Agrifood	93.533	81.029	15,40%
Municipal Network	87.624	-	-
Subterranean Water	5.909	-	-
Other Sources	0	-	-

Source: Adapted from Jerónimo Martins Relatório & Contas 2017

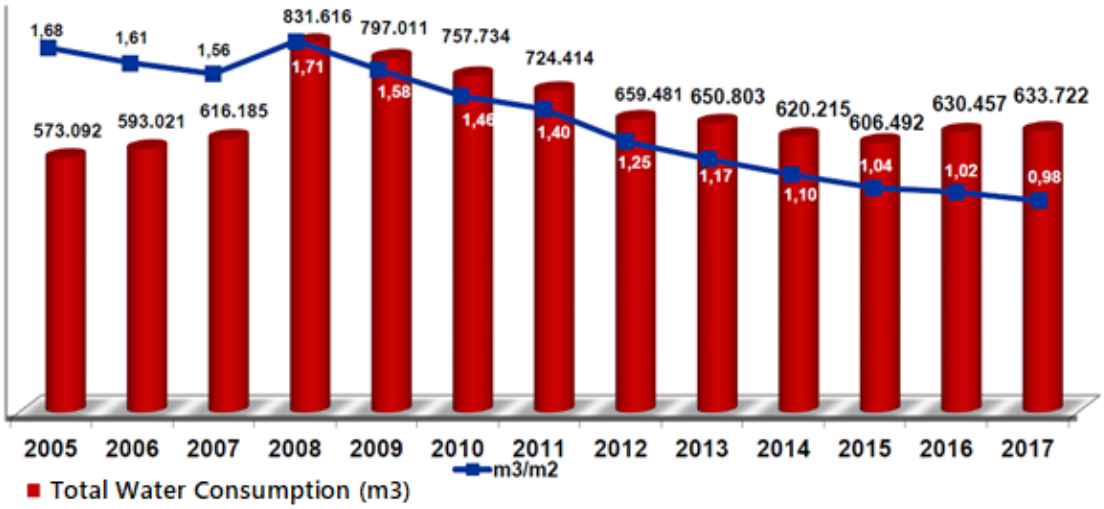
About 93% of the total water consumed by the Group comes from the municipal network. For less demanding operations in terms of water quality (e.g. irrigation and cooling systems), the Group holds the necessary licenses. In 2017, wastewater discharges into the natural environment (Companies of Portugal only) accounted for about 3% of the total volume of wastewater generated by the Group, which are properly treated before its rejection. Regarding the reuse of water, Alfena's Distribution Centres collected more than 1100 m3 of rainwater for use in refrigeration, irrigation and outdoor washing of trucks.

Sonae: The efforts to reduce water consumption have been a theme that the company has been facing for many years, and this is not a recent issue, which has been triggered by the most recent periods of drought in Portugal.

The chart below is very clear from the above, about the specific consumption indicator (m3 / m2).

Even in the case of total consumption, only in the last two years, where there has been a very significant organic growth (opening about 20 new stores per year), the reductions achieved were able to overcome the organic growth registered. Note: the growth registered in 2008 reflects the acquisition of the Carrefour operation (acquisition of Carrefour hypermarkets).

Chart 1 - Total Water Consumption



Source: Sonae interview

The measures they have been implementing are of a different nature and can be subdivided into 3 major areas:

Equipment: (i) Use of faucets and other more efficient equipment; (ii) Water pressure control; (iii) Replacement of cold production systems with high water consumption.

Internal awareness: (i) Training of employees; (ii) Daily consumption information to employees.

Monitoring: (i) Daily consumption control; (ii) Rapid detection and performance in case of leakage.

Sonae also carried out the remodelling of the ETARI, to cover the increase of flow and to improve the quality level of the effluent. This wastewater treatment allowed the use of water in cooling towers, in irrigation, in external washes and in the supply of fire service tanks. Thus, about 18.180 m3 of water is reused annually, of which 15.480 m3 are destined for the two cooling towers and about 2700 m3 are used for irrigation, external cleaning and supply of the fire service tanks.

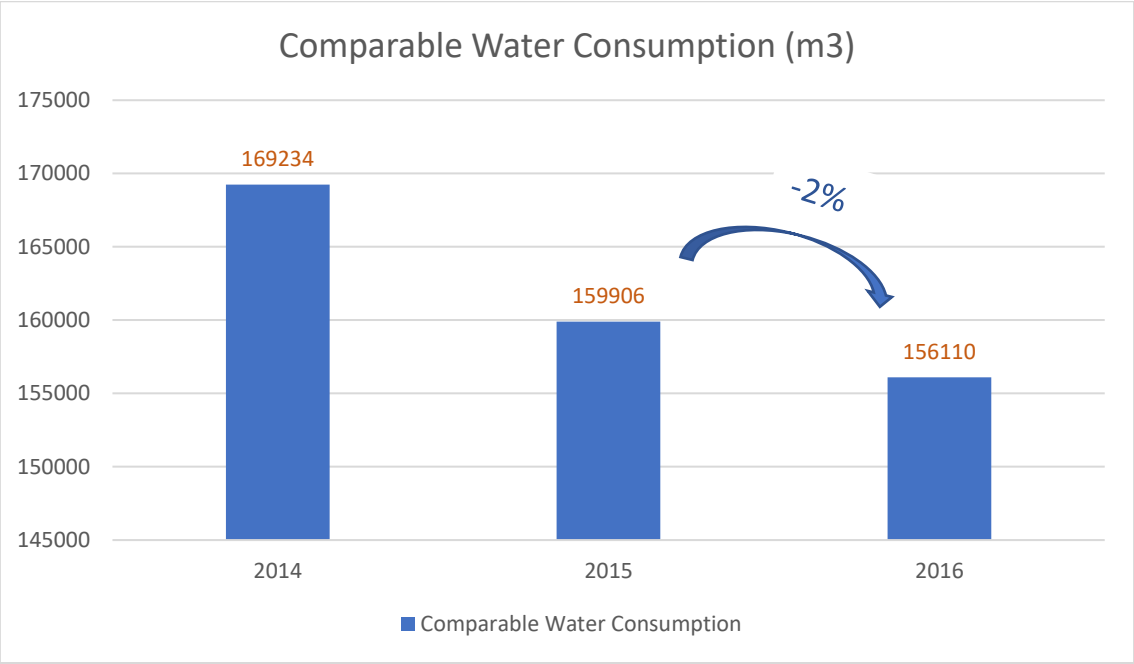
Os Mosqueteiros: Monitoring the consumption of water, electricity and gas in real time and as close to the ground as possible, can reduce the invoice by 10%. The Group therefore proposed the "télé-relève" (remote reading) solution for all points of sale.

Aldi: They consumed around 548.300 m3 of water in 2015, of which approximately 432.000 m3 in their stores. To save water, they rely on efficient technology: for example, in most countries, ovens that use self-cleaning without water are used. In addition, they use economical industrial washing machines with efficient dosing technique and biodegradable detergents to reduce waste water pollution. In Spain, when plants are chosen for outdoor spaces, they have in mind that there are plants adapted to the climate and with little need of water.

Auchan: Measures to reduce water consumption, in 2016, led to a reduction of consumption of 2% in comparable stores. In the total consumption of the company there

was no evolution, consumption remained and in the comparable area by sales the reduction was 6% (0.694 m3 / m2).

Chart 2 - Water Consumption



Source: Adapted from Auchan Relatório de Sustentabilidade 2016

5 - Is it possible for consumers to return purchased and end-of-life products to your stores? What treatment do they have?

Jerónimo Martins: Since the main activity of the Group companies is in the food distribution, this question does not apply to most of the products that they commercialize. In any case, they collect some types of waste from clients in the 3 countries where they operate.

In order to promote the recovery of waste from customers, the Group seeks to ensure the necessary infrastructures and sensitize employees, customers and surrounding communities. In 2017, the following projects stand out:

- Pingo Doce ecopoint network comprised 372 stores, accounting for 88% of the store park;
- The valuation of coffee capsules and caps / corks / capsules resulted in more than 3500 euros, which revert to social solidarity institutions;

- 97% of the Biedronka store park has ecopoints for the collection of small appliances, fluorescent lamps and batteries;
- With the revision of the Colombian legal framework, the project to collect batteries used by customers in Colombia was reactivated, with new ecopoints being placed in 186 stores (47% of the total store park in 2017).

Table 6 - Waste Deposited by Customers in Retail Ecopoints

Residue (values in tonnes)	**2017**	**2016**	**Δ 2017/2016**
Portugal			
Batteries	12,01	12,49	-3,80%
Waste Electrical and Electronic Equipment	78,7	82,04	-4,10%
Used food oils	100,35	109,26	-8,20%
Ink cartridges	2,16	3,17	-31,90%
Capsules	94,68	108,99	-13,10%
Corks, caps and bottle tops	8,51	10,24	-16,10%
Poland			
Batteries	133,54	145,82	-8,40%
Waste Electrical and Electronic Equipment	176,16	224,56	-21,60%
Colombia			
Batteries	0,18	0	N/A

Source: Adapted from Jerónimo Martins Relatório & Contas 2017

In Portugal and Poland, the reduction of 13% in the total amount of customer waste collected is mainly due to the continuous increase in proximity collection points offered by municipalities and other entities.

Sonae: Continente supermarkets collect from their Customers a wide range of waste, being responsible for sending them to appropriate treatment / recovery in operators duly licensed for this purpose.

In 2017, the following were collected: (i) 27 tonnes of Used Batteries; (ii) 23 tons of used Cork Stoppers; (iii) 43 tons of Used Food Oils; (iv) 300 tons of Textile Waste.

In addition, whenever possible, they provide ecopoints in the parking areas of supermarkets under the management of Modelo Continente.

Os Mosqueteiros: Partnership with SILVE, an internal company to sell waste of the company. It uses freight transport to collect and revalue certain types of point-of-sale waste by providing them with an eco-friendly and cost-effective recycling solution. Currently 21 platforms are dedicated to the collection.

The waste is recycled by French paper producers and plastic stoves with which SILVE has established partnerships. In this way, 126.000 tons of carton and 5200 tons of plastic were collected in 1518 points of sale, which were sold to the ten SILVE partner valuation companies. The computerized management system implemented in 2010 allows the tracking of all the lots collected and remunerates the members according to the valued volumes. Thus, the circuit becomes a model of circular economy. In parallel, the sales outlets are ready to value their bio waste. Since January 2016, French companies producing more than 10 tonnes of bio waste per year must be able to exploit them in the form of biogas or compound.

Intermarché implemented at all points of sale collection terminals for lamps, batteries and small appliances.

Aldi: The group's commitment to product quality does not end with the sale. If customers are not satisfied with the quality of the products, they can be returned to the store. With the "ALDI Guarantee", an uncomplicated exchange and guarantee system is offered. Complaints can draw important conclusions about the quality of the product. In the case of anomaly, in any category of products, independent and accredited laboratories are requested to carry out a sample analysis. If an anomaly is found to exist, suppliers are required to give their opinion and provide an action plan to avoid future nonconformities. If, despite the checks, quality anomalies are detected after the start of commercialization, products are immediately collected. If there are doubts about the safety or health control of the products, collection actions are initiated.

Auchan: "We give new life to waste to give everyone a better life", is the motto for the Customer's awareness in the delivery of their waste for recycling. In addition to their internal waste management program, they are committed to assisting the customer by offering solutions for the collection of different types of waste (used electrical and

electronic equipment, used oils, lamps, portable batteries and regular batteries, ink cartridges, cork stoppers, automobile batteries). In 2016, they have provided new ecopoints for the Customer's refurbished waste collection at store entrances.

6 - What measures do you take to avoid waste and to reuse surpluses?

Jerónimo Martins: The Group have been investing in Distribution Centres that are more efficient and have a location that allows the efficiency of their operations. This development model allows reducing the distances travelled for product delivery, thus reducing the time needed to reach the customer, contributing to a higher product quality and freshness of the articles, and consequent reduction of carbon emissions. The training of employees is also essential for maintaining the Group's high quality and food safety standards. Jerónimo Martins invests continuously in the certification and monitoring of its processes, facilities and equipment to guarantee quality and safe products. Thus, in the implementation of adequate procedures and evaluation of the respective performance indicators, it counts not only with its Quality and Food Safety technicians, but also with external auditors.

Table 7 - Audits Carried Out at Pingo Doce and Recheio

	Pingo Doce			Recheio			Distribution Centres		
Stores and Distribution Centres	**2017**	**2016**	**Δ 2017/2016**	**2017**	**2016**	**Δ 2017/2016**	**2017**	**2016**	**Δ 2017/2016**
Internal Audits	836	1.004	-17%	85	106	-24%	39	25	56%
Tracking Audits	1.376	785	75%	139	107	30%	76	19	300%
External Audits	19	16	19%	55	32	72%	10	3	233%
HACCP Performance	88%	86%	2 p.p.	87%	82%	5 p.p.	90%	91%	-1 p.p.

Source: Adapted from Jerónimo Martins Relatório & Contas 2017

The Group adopted the Resolution of the Consumer Goods Forum to reduce food waste by half by 2025, with 2016 as the reference year. Thus, based on the recommendations of the Food Loss and Waste protocol, an annual value for food waste was determined for the Group's Food Distribution companies. In 2018, they will continue with the practices and projects that have been developed, such as the establishment of partnerships with suppliers and food donations to solidarity institutions. Food surpluses that meet

established food safety requirements but are not fit for sale are sent to social solidarity institutions. With the arrival of refugees to Portugal from several countries in the Middle East, notably Syria, a partnership was established with “Pão a Pão” - the Association for the Integration of Middle East Refugees, with the mission of responding to the inclusion and employability of Syrian refugees, through the launch of the Mezze restaurant (Meal).

Regarding the relationship with suppliers, Jerónimo Martins promoted the acquisition of uncalibrated foods, which previously had little or no value. In this way, it has contributed to the reduction of waste upstream of its operations, while ensuring that these products, whose nutritional profile is the same as the economic calibrated products, are integrated into the value chain, reaching the consumers table.

In total, in 2017, more than 13.600 tonnes of these products, also known as "ugly" fruit and vegetables, were put on the market, allowing an increase of over 2% comparing to 2016.

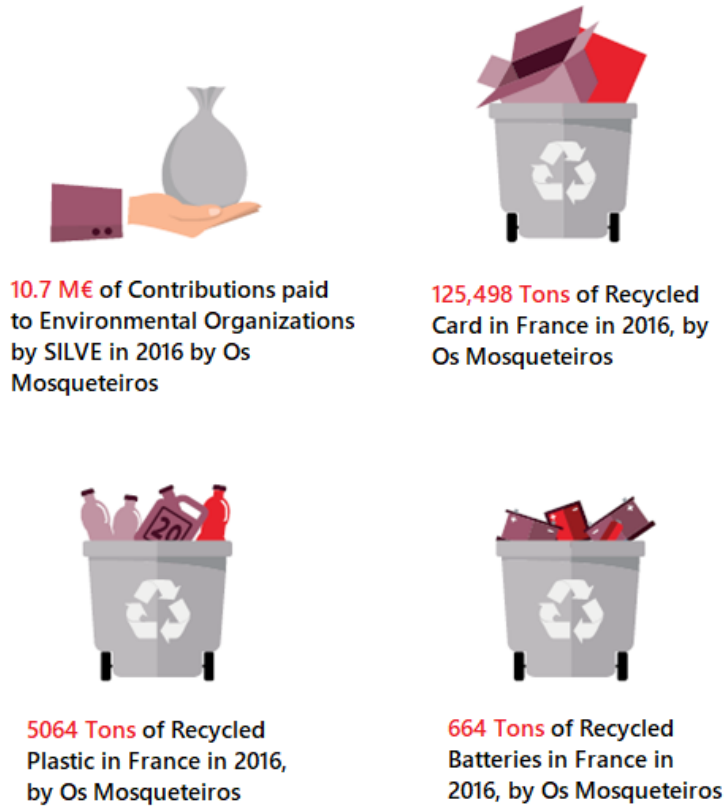
Sonae: Continente acts primarily in prevention. They have a team dedicated to work on waste prevention, through the processes of quality management, operational processes, validity management, procurement algorithms and the level of packaging, for example.

However, in the retail business some surpluses are inevitable. When it happens, they privilege its reuse for human consumption, through donations, working with about 1000 institutions throughout the country. Other forms of reuse, depending on the conditions of the products, are transformed into new products or their donation for animal feed.

Os Mosqueteiros: With a loss rate of 3.3%, large supermarkets waste about 10 million tonnes of food each year. They have identified several ways to fight against food waste: better monitoring of consumption cut-off dates and integration of product lifecycle criteria into tenders. One quarter of the stock of food banks comes from donations made by distributors. In June 2013, they signed a partnership agreement with the French Federation of Food Banks (FFFB), which allows several associations to benefit from products that are taken from linear ones, either because they no longer meet quality standards but are consumable (e.g. the packaging is damaged), or because the shelf life is short (compliance with the rules on consumption cut-off dates). At the same time,

Intermarché sensitizes consumers to food waste with a very popular campaign on ugly fruit and vegetables, with the development of good practices at their points of sale: donation of meat and bread trimmings from the day before to breeders and animal owners, the composition of "special soup baskets" with visually imperfect vegetables, the development of bulk sales, the sale of products with a short shelf life, etc.

Figure 7 - Recovery of Waste Deposited in Ecopoints



Source: Mosqueteiros, Os. 2017. Relatório de Desenvolvimento Sustentável

Aldi: To avoid waste, they plan their supplies conscientiously. In Germany, France and Poland, meat and fresh fish products are marketed at lower prices shortly before the end of their shelf-life. Despite these measures and careful planning, they are not always able to sell all their articles. They must withdraw the products suitable for consumption that no longer meet their quality and freshness requirements. Throughout the business group are donated many food goods that are no longer sellable but can still be consumed as well as other non-food items. Many ALDI Nord companies cooperate with non-profit organizations and food banks. In the period under review, about 62% of our stores

donated food that was no longer sellable but could still be consumed. In some countries, non-open items from daily product tastings, as well as other product samples, are also donated. ALDI Portugal participates since 2013 in the Montijo Food Support Network. Food items that are not delivered to stores are donated to social and charitable institutions that are part of this network. In 2015, the commitment was extended to four Portuguese stores. They began cooperating with the Portuguese-German Charity Association (PGCA) and the non-profit association Re-Food Portugal, which distributes food surpluses to those most in need. In Germany, they work mostly in cooperation with regional food bank organizations. ALDI Belgium regularly donates, in all stores, Christmas and Easter items that are no longer saleable. In Denmark, they cooperate with a non-profit restaurant in Copenhagen, which uses donated food; with the proceeds, humanitarian projects are supported. Since 2011, ALDI Spain regularly donates food: Spanish shops cooperate with several local organizations of the national food bank. In the locality of Chorzów, Poland, non-sellable food but still fit for consumption, as well as samples of products, are donated to Caritas Poland. ALDI Netherlands has been working with the Dutch food bank since 2016 and has initiated pilot projects in two regional societies.

Auchan: The group is based on a waste management policy with the following hierarchy: 1st Prevention; 2nd Minimization / Reuse; 3rd Recycling; 4th Energy Valuation; 5th Landfill.

The first mission of Auchan is to prevent the production of surpluses with a negative impact on the environment by obtaining ecological raw materials. At the end of life of products, customers can return them to stores, where they will be later evaluated according to their state. In the case of materials that have slight defects and can be easily repaired, they will be analysed and forwarded again to the customer. In the case of waste that cannot be used through composting and recycling processes, they will be sent to an energy recovery centre where they can be transformed into biogas.

In 2016, the group was able to value 91.6% of its waste.

7 - Is there concern in the materials used for the packaging of the products? Is ecodesign present in your routines?

Jerónimo Martins: The Group works in collaboration with suppliers to improve the eco-efficiency of Private Label packaging according to design strategies aimed at reducing the environmental impact associated with the packaging of marketed products and optimizing the costs of production, transportation and packaging waste management. For the period 2018-2020, it aims to implement, annually, at least 20 projects of this nature.

Table 8 - Packaging Ecodesign Savings

References Covered	Portugal	Poland	Unity
Number of References	265	12	SKU*
Saving of packaging materials	2.495	979	t of materials/year
Avoided transport	475	-	t CO2/year
FSC certified packaging	42	-	SKU*

*SKU – Stock Keeping Unit

Source: Adapted from Jerónimo Martins Relatório & Contas 2017

In Poland, all cartons of Polish suppliers for fruit and vegetable packaging are made from recycled and FSC-certified carton. In 2017, the project was replicated for Private Label products (500 references).

In Portugal, the use of reusable plastic boxes in the Perishable and Dairy areas remained in 17% of the total of boxes moved. In Poland, the use of reusable plastic boxes for the packaging and transport of small electronic equipment (more than 77 thousand units) was continued and in Colombia, reusable transport boxes for bottled water and for fruit and vegetables were also maintained (about 596 thousand units).

Table 9 - Cash Bags and Reusable Solutions

Input	2017 ton. | uni.	2016 ton. | uni.	Δ 2017/2016 ton. | uni.	Δ 2017/2016 ton. | uni./000 €
Plastic carton bags - tons	5.531	5.339	3,60%	-7%
Paper Box Bags - tons	117	173	-32,40%	-39%
Reusable plastic bags - tons	2.050	1.875	9,30%	-2%
Reusable raffia bags - tons	976	978	-0,20%	-10%
Trolleys - units	26.954	11.718	130%	107%

Source: Adapted from Jerónimo Martins Relatório & Contas 2017

In the Jerónimo Martins Group, the plastic bags are not distributed free of charge in the payment boxes of any of the Companies. This initiative has been progressively adopted since 2007.

Sonae: For many years they have looked at the environmental problems associated with the use of plastics.

Reduction of plastic material in various uses, such as the thickness of the packaging / transport bags, bottles of water or yoghurt packages have been examples felt by consumers.

Raising awareness about recycling is another theme they have been working on for a long time. The most important example of the consumers was the light bags distributed between 2004 and 2007 with the recycling colours (blue, yellow and green) containing simple phrases encouraging their reuse to place other packages in their respective ecopoints.

Another measure also felt by consumers was in 2015, when they stopped making "Light Plastic Bags" available for the transport of goods. Since that date, Continente supermarkets have only made reusable bags available.

Lastly, as far as ecodesign is concerned, they would like to point out that, as retailers, all the efforts made in this area are totally dependent on the most sustainable and credible solutions that can be presented at any moment by the product suppliers (packaging included).

It is therefore in the mentioned interaction (point 3) that they maintain with their suppliers, or in the search for new suppliers that present more sustainable and credible solutions

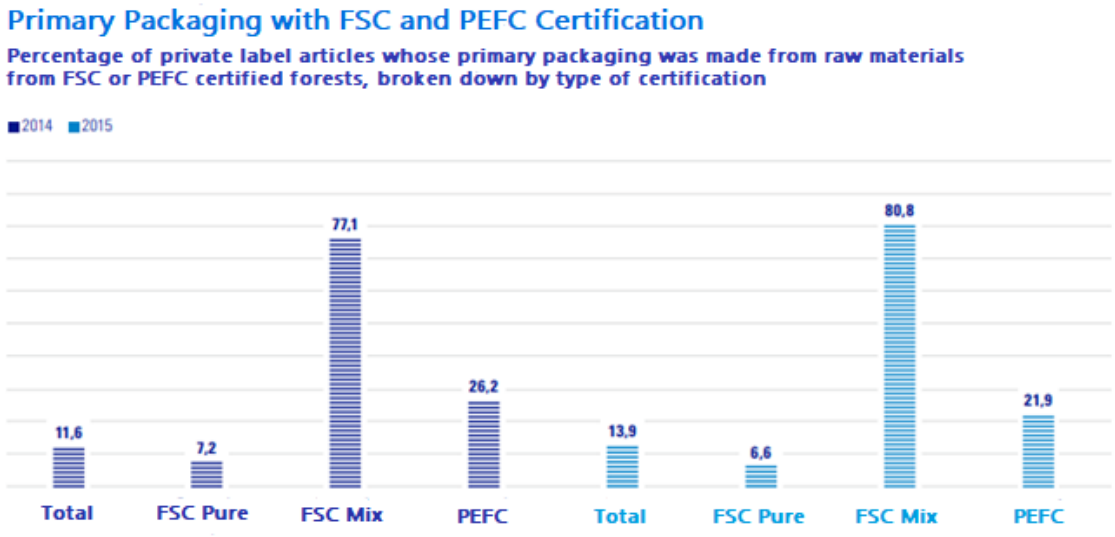
based on the performance, always bearing in mind their mission to make available to the clients the best products at the best prices, under the best conditions of hygiene and safety, and environmentally responsible.

Os Mosqueteiros: The group relies on all its processes in recyclable products, demonstrating their concern in reducing the impact on the environment. Thus, the bags used in stores and available to the customer are made of recyclable materials and can be reused as often as necessary.

Aldi: The reusable transport bags have been implemented in stores since 2014, being used for frozen products, bakery, fruits and vegetables. In 2015 more than 6 million copies of reusable bags were sold. This bag is made mostly of used PET bottles and can be reused up to 200 times. It has capacity for more than 20 empty 1.5 liter PET bottles, which can be transported to the nearest ecopoint. This bag has been certified for over 15 years in Germany with the environmental certificate Blauer Engel (Blue Angel).

The group values the ecological design not only of transport packaging, but also of packaging of products. Therefore, it was defined that in the procurement process suppliers should use sustainable materials and renounce the use of PVC and composite materials. For wood and paper, the focus is on recycled materials and raw materials from sustainable forest management. By 2015, 14% of the product packaging and approximately 21% of the outer packaging with paper components were certified with a sustainability label.

Chart 3 - Primary Packaging with FSC and PEFC Certification



Source: Adapted from Aldi Relatório de Sustentabilidade 2015

Auchan: Since 2011, Auchan has been engaged in the eco-design of products for packaging optimization in their own brand. The aim is to reduce cost and environmental impact, by reducing the raw material used, using mono material to simplify end-of-life recycling of the packaging; proper packaging of the products to transport, to reduce the number of journeys required. Market Loose, where the customer buys the product in weight in the quantity he needs without waste also in the packaging (http://responsavel.jumbo.pt/social/disponibilizamos-productos-avulso/). The Self-Discount, with products with simpler packaging and where in the purchase of the Fruits and Vegetables for this market is opted for a smaller calibre offer, admitting product with epidermal defects (natural defects of fruits and vegetables that do not call into question the quality, but are usually wasted for consumption).

8 - How is the cargo stored in the transport vehicles?

Jerónimo Martins: Within the scope of the Group's commitment to reduce the environmental impacts associated with logistics processes, the following actions are highlighted:

- In Portugal, at the end of 2017, 83% of freight vehicles met Euro 5 (169 vehicles) and Euro 6 (107 vehicles). In Poland, 93% of freight vehicles met Euro 5 (620 vehicles) and Euro 6 (267 vehicles). In Colombia, 12% of trucks met Euro 5 requirements (14 vehicles);
- In Portugal, conventional diesel was changed to "top diesel" in the fleet vehicles, affecting the Distribution Centres, with a saving of 0.2l / 100 km, which led to a diesel consumption reduction in 2017 of about 50.000 liters;
- The backhaul operation in Poland corresponded to a volume of 361.592 pallets collected, 18% more than in 2016, resulting in a saving of 1.321.940 km and avoiding the emission of 3.436 tonnes of CO2. In Portugal, this operation represented a volume of 192.400 pallets, 2% more than in 2016, resulting in a saving of 6.732.404 km, equivalent to the non-emission of 5.981 tonnes of CO2 into the atmosphere.

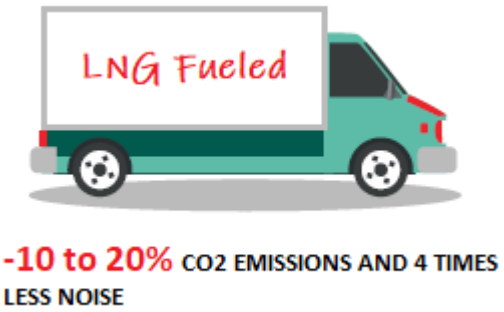
Sonae: The packaging of the goods in the supplier vehicles of their stores is done, mainly in pallets. Meat and fish products are mainly transported in their own dedicated and reusable boxes. Also, the pallets are, in their overwhelming majority, reusable.

Sonae has implemented the Pool Service, which allows reuse of pallets and boxes, reduction of kilometres travelled by vehicles and reduction of fuel consumption and CO2 emissions. The vehicles used collect the pool equipment, and then deliver to service centres created for this purpose in the warehouses of Sonae. Upon receipt of the equipment, sorting and preparation for supply to the various users (producers / suppliers) are carried out, and the pallets and boxes are immediately available for reintroduction into the logistics circuits. In this way, Sonae suppliers avoid costs and increased travel time for the purchase of pallets and boxes.

Os Mosqueteiros: The management of the Group's logistical challenges also has an impact on its objective: reduce greenhouse gas emissions by 30% by 2030 compared to the values of 2012. In fact, the 44 logistics bases have a fleet of about 1500 semi-trailers, which carry out 150 million kilometres per year.

Such as the Béziers base, inaugurated in 2014, all the new logistic bases built by the group respect the principles of construction of the Alta Qualidade Ambiental (AQUA) and have a liquefied natural gas (LNG) tank. An LNG engine generates four times less noise than a diesel engine, while greatly reducing pollutant emissions: -95% particulate matter, -80% nitrogen oxide, -15 to 20% CO2. The Group is the first distributor to use natural gas at such a significant scale. When they opened their first points of sale, they invested in a fleet of trucks specially adapted to the deliveries in the centre of the city. In operation with biogas, they are equipped with electric refrigerators and meet the highest standards of sound pollution regulations both when they are in operation and when they stop (floor, rear door, electric curtain and silent forklift).

Figure 8 - LNG Fueled Vehicles



Source: Mosqueteiros, Os. 2017. Relatório de Desenvolvimento Sustentável.

In logistics, the reduction of greenhouse gas emissions is primarily due to the optimization of routes. The Miribel and Reyrieux bases in the department of Ain have a new route management tool that allows them to reduce distances by 3 to 5%. This route optimization tool will be implemented on all bases.

Aldi: In order to ensure that customers find fresh products and full shelves daily, it is necessary to adopt efficient freight logistics. In this way, the best routes are used, and the merchandise flows are grouped, whenever it is justified. This reduces transport fuel consumption and saves greenhouse gas emissions. In addition, fuel consumption is reduced either by roof spoiler assembly, which reduces the air resistance of transport vehicles or the use of low rolling resistance tires. In addition, alternative engines have been tested in Germany for vehicles transport. Throughout the business group were transported in 2015 goods with a volume of approximately 29 million-euro pallets among

the 74 logistics centres and more than 4800 stores. These transports are mostly carried out by the group. The company has a fleet of 1620 heavy vehicles. The self-supply share of the ALDI Nord business group is 89%, ensuring a direct influence on logistics processes. They just do not have their own fleet in Spain, Poland and Portugal. Logistics fuel consumption in 2015 accounted for 19% of energy needs and caused approximately 13% of CO2 emissions. At 99%, diesel accounted for most of the fuel consumption. To reduce the fuel consumption of the fleet, it is sought to continuously optimize the supply of the stores: ALDI Nord heavy vehicles should only leave the logistics centres with full load. With efficient route planning, the number of trips required is reduced.

Auchan: In food safety, their self-monitoring systems work day-by-day to control and avoid changing products, avoiding the waste caused by poor handling or poor storage conditions. The group seeks to maximize the load on each vehicle to reduce the number of trips and save on fuel.

The company's logistics process has a significant impact on the environment, and so, in recent years some efficiency measures have been implemented to reduce this impact. Regarding the logistics platforms, in 2016, cross docking platforms were implemented, allowing to reduce the unnecessary distance travelled, and consequently associated emissions. The occupancy rate of vehicles on return journeys increased through the continuous development of Backhauling partnerships. In online deliveries, in 2016, the fleet was renewed with the replacement of the most polluting vehicles and training actions were carried out for drivers.

9 - Since we are walking in the Digital Era, how has your communication with the client been adapted in this area?

Jerónimo Martins: The rapid development and adoption of digital communication technology solutions has made them a central part of how brands communicate and interact with their audiences. This is also what has happened in the Jerónimo Martins Group.

Regarding Sustainability information, the Group uses different channels to communicate digitally with its audiences, always trying to adapt the messages and contents to optimize

them and make them as relevant as possible to them. Some of the channels used for this purpose are:

- Institutional websites of the Group and its Companies - where the Group shares its sustainability strategy, its policies and operating methods, as well as initiatives developed in this area and the respective results. The Group's corporate website and the Digital Reports & Accounts are examples of the communication in these channels.
- Official social media pages - where the Group and its companies share sustainability initiatives to broad audiences, such as the official LinkedIn Group pages, YouTube or the official Pingo Doce Facebook page.

The Group also shares its sustainability messages in other digital publications, such as Feed magazine, Pingo Doce's "Sabe Bem" magazine or "Notícias Recheio" magazine, which is aimed at the Horeca channel professionals.

In addition, the Pingo Doce website features two catalogues, regularly reviewed, that are intended for consumers with special dietary needs / preferences. The "Lactose and No Milk" and "Gluten Free" catalogs are available for download. Also, the Pingo Doce app lets you create shopping lists, making it easier to identify customer needs and make more informed purchasing decisions.

These forms of communication are complemented with the information on the product packaging, informing about any sustainability certifications, or on the nutritional profile - in the last case, the QR Code for Pingo Doce charcuterie products allows consumers to be informed of the origins of the product.

Sonae: They have already used several digital media today, which significantly reduces the impact on the environment of their communication. Examples of this practice are:

- All the Continente's leaflets have a digital version, distributed by email and made available on the website weekly to hundreds of thousands of customers. The printed version and its door-to-door distribution has been substantially reduced.

-The discount coupons are now distributed to hundreds of thousands of customers via email and mobile phone application, replacing the traditional distribution of printed coupon or physical mail.

Os Mosqueteiros: The economy of sharing has also developed in other sectors: people who occasionally do bricolage jobs do not always need to buy a drill. Thus, Bricomarché and Brico Cash prefer to encourage them to rent work tools, so they have partnered with Loxam, a specialist in material rental.

To encourage consumers to adopt LED light bulbs, Netto and Intermarché have launched a "free bulbs" operation. After registering on the dedicated website, customers could receive a set of 10 LED bulbs, worth 102 euros.

In this way, the group has increasingly bet on the communication with the customer via web, to be up-to-date on campaigns, discounts and other types of sustainability actions by Intermarché.

Aldi: Development of the ALDI Transparency Code, which allows consumers to enter the code of their products on the website, and thus trace it to its origin. This method has increased consumer confidence in products purchased from ALDI. All products have on the back of the package a QR code that can be digitized with the smartphone, allowing the customer to get all the information regarding the product.

Auchan: Launch of a new website focused on sustainability: www.responsavel.jumbo.pt. This digital platform reinforces the responsible trade policies of the brand in areas such as preservation of the environment, incentive to saving, non-waste, national production and support to local communities. The website presents a weekly selection of organic, ecological and / or national products; highlights the Producers of Portugal, who respect good environmental practices to offer fresh food daily, and share testimonies of collaborators and prominent figures who, through simple and practical tips, inspire the adoption of more sustainable behaviors in everyday life.

Creation of the Rik & Rok Schools Project: with 20 years of existence and around 30.000 members, Rik & Rok Club is the only children's club in the distribution sector in Portugal. Aimed at children from 4 to 10 years old, it is based on a communication platform dedicated to the themes of sustainability, environment and healthy food and life. Its main objective is the promotion and sharing of playful and pedagogical contents that stimulate the creativity, free initiative and the literacy of the kids. One of the initiatives that

materializes the axis dedicated to the environment and sustainable ecosystems is Projeto Escolas.

10 - What sustainable measures do you intend to implement in the near future?

Jerónimo Martins: The Group continues to consider environmental concerns and the reduction of the ecological footprint as important issues for the company, and so, they present a number of proposals and objectives by 2020:

Promote Health through Food

- Continue to improve the nutritional profile of Private Label products, through innovation and reformulation of products, and Meal Solutions.
- Continue to develop programs to promote the Mediterranean Diet and healthy nutritional habits based on recommendations from local experts and to raise consumer awareness of food labels.
- Increase by 5% per year, compared to 2017, the number of lactose-free and gluten-free products in Portugal and Poland.
- In Portugal and Poland, develop animal-free food solutions for consumers with specific dietary needs / preferences.
- In Portugal and Poland, ensure that products intended for children have a nutritional profile higher than the market benchmark.
- In all geographies, keep the analysis of Private Label products for their raw materials in external laboratories, ensuring their authenticity and combating food fraud.
- In all countries, ensure the use of voluntary non-GMO labelling for all references potentially containing genetically modified ingredients.
- In all countries, facilitate responsible consumption through voluntary labelling on nutritional dimensions and alcoholic information.
- In all countries, provide consumers with the management of the expiration dates of food products and combat food waste by adopting only an expiration date on product labels.

Respect the Environment:

- Reduce the Group's carbon footprint by 5% in the 2018-2020 triennium (per € 1,000 sales) compared to 2017.
- Reduce water consumption annually by 2% (per € 1,000 sales).
- Reduce electricity consumption annually by 2% (per € 1,000 sales).
- Reduce the amount of waste sent to landfill by 5 pp in 2018-2020 compared to 2017.

- Implement annually at least 20 ecodesign packaging projects in Private Label items.
- Reduce the Group's food waste by 10% in 2018-2020 compared to 2016.
- Increase the number of sites with environmental certification (25 minimum).

Buy with Responsibility

- Ensure that 80% of Jerónimo Martins Group's purchases of food products are made to local suppliers.
- Continue to introduce sustainability certificates (e.g. UTZ, Fairtrade, MSC, ASC, RSPO, EU Ecolabel, EU Organic Label, etc.) for at least 10 Private Label and Perishable Products.
- Contribute to achieving the Zero Net Deforestation objective by 2020 as defined by The Consumer Goods Forum, namely through the active management of palm oil, soybeans, beef, wood and paper.
- Conduct annually at least 50 environmental audits to private and perishable suppliers.
- Conduct at least 40 environmental audits annually to service providers.

Supporting Surrounding Communities

- Monitoring and dissemination of the social impacts resulting from the support offered, according to the London Benchmarking Group (LBG).
- In Portugal, start at least one community investment project per year, aimed at children, young people and the elderly from vulnerable backgrounds.
- In Poland, reinforce involvement in social projects focused on children, young people and the elderly from vulnerable backgrounds.
- In Poland, expand the food donation program directly from the stores to local non-governmental organizations. By 2020, it will cover 1,500 stores.
- Launch together with Caritas Polska a program to support vulnerable seniors, with an expected impact of at least 4,000 people every year.
- In Colombia, maintain involvement in social projects such as SOS Children's Villages Colombia, and ABACO - Association of Food Banks of Colombia for the donation of foodstuffs.

Be a Reference Employer

- Continuous improvement of employees' quality of life through internal social responsibility programs in all countries where we are present.
- Continuous reinforcement of training and information programs related to the Code of Conduct aimed at all employees of the Organization, regardless of their place of work or function, promoting their compliance.

- Promote diversity in attracting talent.

Sonae: At Modelo Continente, they are always available to adopt measures that are positive from the point of view of eco-efficiency.

Irrespective of this position, which may lead to the implementation of non-programmed measures, they can say that during 2018:

- Pursuing with the commitment of installing electricity production plants from renewable sources, namely photovoltaic power plants. Note: the plants already installed contributed in 2017 to the production of around 9 Gwh;

- Achieving 100% of the lighting of all our stores using LED equipment;

- Continuing efforts to reduce water consumption by improving the monitoring process (telemetry);

- Continuing the search (with installation of pilot projects) of local treatment solutions (in the own stores) of the organic fraction of the RSUs generated;

- Continuing to stimulate solutions that contribute to the reduction of food waste;

Os Mosqueteiros: By 2020, waste treatment will respect the 3R rule - Reduce, Reuse and Recycle - so the group's waste bins no longer contain waste to be incinerated. The linear model of production and consumption should move towards a more circular economy, based on increasing the duration of the use of the products, on using them instead of physical possession of the goods and, finally, on the reutilization or recycling of the materials.

Intermarché intends, until 2025, to ensure that all its own branded products will come from a transparent and responsible line. Thus, eight interim commitments have been set for 2020:

- Support national producers in the conversion to organic farming for three years
- Control the use of pesticides in crops of fresh fruit and vegetables
- 100% of the fish traced and a progress plan for responsible fisheries
- 100% of eggs produced through alternative breeding modes (codes 0, 1 and 2)
- 100% traceable and sustainable palm oil

- 100% coffee from responsible rows
- Implement a surveillance plan in all ranks presenting risks
- 90% of French suppliers in own food brands

Short-term goals: reduce energy expenditure by 30% and use 20% of renewable energy throughout the group by 2025. Use 100% responsible brands at all points of sale.

The group invested 50 million euros in the "Sustainable Sea Line 2025" plan, which covers the whole range: fishing, filleting, preparation, processing and sale in the fishery section. The commitment is to stop fishing for deep-sea species by 2025. The share of deep-sea species has thus gone from 41% of catches in 2005 to 18% in 2015. Scapêche ceased fishing in deep waters on 1 January 2015, before the European regulations of 2016.

Aldi: To convert the articles and packaging of wood / cellulose to sustainable materials, the following objectives were defined:

- By the end of 2020: 100% conversion of wood and / or wood-based products to sustainable certified qualities. For this purpose, the standards of FSC (FSC N002738), PEFC and the EU Ecolabel are accepted;
- Conversion of all tropical and / or tropical wood products produced in BSCI risk countries, negotiated as of 01/01/2018, for FSC certified qualities;
- By 2020, 100% conversion of all wood and / or wood-based packaging (for sale, groupings and transport) to sustainable certified qualities and / or recyclable materials;
- Renunciation of printing inks composed of mineral oils;
- Use of totally chlorine free (TCF) bleach as a bleaching process with less environmental impact;
- Verifications of the type of wood and the origin of the products, carried out by independent laboratories.
- Creation of ALDI SUD, supporting the Detox Campaign together with Greenpeace, aiming to eliminate by 2020 some chemicals present in drinking waters

The ALDI Nord group is represented in nine European countries with more than 70 regional societies. Through the International Tea Procurement Policy, it is intended to support the cultivation of tea and tea-comparable products and to improve the working and living conditions of tea farmers and their families. Thus, the following objectives were established:

- By the end of 2018: convert 80% of the quantities of black and green tea used in tea branded products with a sustainability certification in all ALDI Nord countries.
- By 2018 to convert from 40% of the quantities of herbal and fruit tea to certified sustainable raw materials by Rainforest Alliance, Fairtrade, UTZ, UEBT / UTZ or by the end of 2020 Bio.

Establishment of international requirements for flowers and plants through the International Flower and Plant Purchase Policy, supporting the sustainable cultivation of flowers and plants and improving the working and living conditions of farm owners, their families and workers. In order to comply with these requirements, the following objectives were defined:

- By the end of 2019: conversion of all flowers and plants to sustainable and certified merchandise, if it is available at the place of origin and with its quality;
- By the end of 2019: application of the GLOBAL G.A.P label in all flower and plant articles for better transparency and traceability;
- To contribute to the protection of bees, the use of toxic substances for bees in cultivated fruits and vegetables was waived in Germany.

Auchan: Objectives to 2020:

- Regulate resource extraction, end overfishing and illegal fishing and implement scientifically based management plans
- Have the full range of fresh, frozen, salted, smoked, preserved and other processed fish evaluated.
- Objective: by 2025, double the number of partnerships with local producers (compared to existing ones in 2016).

Objectives until 2030:

- Duplicate agricultural productivity and income of small food producers
- Ensure sustainable food production systems and implement resilient agricultural practices that help maintain ecosystems
- By 2030, ensure that all students have acquired the knowledge and skills necessary to promote sustainable development
- By 2030, double the overall rate of energy efficiency improvement.
- By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse.
- By 2030, halving food waste per capita worldwide, retail and consumer.
- By 2030, send to landfill 0% of the waste produced.

5. Conclusions

5.1. Main Conclusions

After analysing all the responses of the different companies to the survey presented, the first conclusion that can be drawn (and perhaps the most important) is that sustainability and the need to readapt corporate processes to a circular economy is nowadays, a very present topic, and already based on methods developed and implemented transversally at all levels of the companies. We are striving towards the unsustainability of the planet and the extinction of natural resources, and so, it is important to emphasize the awareness of the companies, which are intended to give the motto for a change of mentalities and for a healthier and free retail market of chemical compounds. Regarding the measures already adopted by the companies, it is noted that energy efficiency, reduction of water consumption and the sustainable policies of maritime and forestry exploitation to obtain raw materials are the 3 most important key assumptions and with the greatest impact on companies in the present study.

Starting with Jerónimo Martins, the Group is one of the companies that shows greater concern about sustainability and the need to adopt a Circular Economy in Portugal. The fact that 4 of the 7 Distribution Centres have environmental certifications represents the group's commitment to regulate the facilities in order to comply with all environmental standards. This regulation is also extended to the stores that the group has both in Poland and in Colombia. There is also a great concern about the overfishing of some endangered marine species, as well as the over-exploitation of palm oil and cocoa, with the group ensured certification of these activities by national entities and independent international groups. All of Jerónimo Martins' activities are in the interest of its stakeholders, and so, there is a concern and commitment to disseminate all actions through various communication channels, such as the company website, media, accounts reports, corporate magazine and social networks, following the trends of an increasingly technological society. In the same way that the activities of Jerónimo Martins are in the interest of its stakeholders, namely the suppliers, the activities and concerns of the suppliers are of the utmost importance for Jerónimo Martins. The group gives importance and priority to national producers, supporting agriculture and fishing, and seeking to boost the Portuguese economy. A Code of Conduct with its suppliers was also established,

which permitted the cancellation of institutional relations whenever human rights/labour abuse practices were registered, or if they did not demonstrate environmental concerns in their activities. In this way, Jerónimo Martins regularly performs audits to its suppliers in order to ensure that all these commitments are respected. Due to the extensive periods of drought that our country is experiencing each year, the group has concerns about reducing water consumption and implementing efficient control systems for cold centrals, flow reducers, timer taps and regulation sensors for ice machines. All these measures, coupled with strategies to reduce energy consumption, saved 4,4 million euros by 2017. Recycling is a key process for sustainability, and so, the group has increased the network of ecopoints in all the group's stores (including in Poland and Colombia), allowing its customers to return to the stores the products that are at the end of life. For food products, partnerships were established with charitable institutions in order to reduce waste and distribute food to people in need. Jerónimo Martins has also sought to locate its Distribution Centres strategically close to the areas with the highest population rate, in order to reduce distance and reduce fuel consumption and carbon emissions. All transport vehicles meet the requirements of Euro 5 and Euro 6, ensuring that the particles and gases emitted to the atmosphere are in small quantities, and follow a backhauling strategy ensuring the cargo is packed to its maximum capacity. Ecodesign is also a very present strategy in the group's stores, and boxes made of recycled plastic are a norm in the transportation of perishables and dairy products, while the boxes of suppliers are made of recycled cardboard and certified by regulators. On the other hand, plastic bags for customers are not distributed free of charge, seeking responsible consumption. By 2020, Jerónimo Martins is committed to continuing the good path that has been taken so far, through the promotion of a healthy diet free of chemical compounds and the commercialization of foods resulting from overexploitation and dangerous hunting. Environmental concerns will continue to be a constant in the group, aiming to reduce 5% of the carbon footprint by 2020, and reduce water and electricity consumption by 2% each. National production is the image of the group, and the support to domestic producers will be maintained or even improved.

In the case of Sonae, the implementation of the LEED Framework allowed the construction of a building that is considered an example of ecoefficiency, by reconciling 5 sustainable strands that allow in the long term the reduction of the impact of their processes on the environment. All the materials used in the construction are obtained in

a sustainable way and with the purpose of being recycled, to reduce waste. Also, the energy used is efficiently obtained through cogeneration facilities, by taking advantage of waste heat for energy production. In addition, the company has adopted water-saving equipment, and reuses water from washbasins and showers to be flushed in urinals and toilets. The daily control of water consumption and the training of employees are some crucial measures to solve the excess of wasted water. On the other hand, the remodelling of the ETARI was responsible for the reuse of 18.180 m3 of water per year. The company concern to involve all stakeholders in decision making, to listen to the different ideas presented, allowing a healthier relationship and in convergence with the satisfaction of all parties. Concerns about the working conditions of employees, producers and suppliers are constant, while the company seeks to deal only with suppliers who have in their philosophy of work sustainable and ecological methods. The implementation of the "Clube dos Produtores Continente" allows to support and stimulate the national production and the supply of the Portuguese and international market with quality products. Sonae commits itself to its customers in making available ecopoints and collection points within their establishments, so they can collect products and waste for later recycling. On the other hand, the group works in partnership with various charities organizations throughout the country, allowing the donation of surplus textiles, footwear, or food. The problem of plastic has long been identified by the group, which stopped making light plastic bags available to make reusable bags made from recycled products. In order to package the correctly transported goods, Sonae has adopted the Pool Service, which allows reusing the pallets and boxes, reducing the kilometres travelled by vehicles and reducing fuel consumption and transportation costs. Sonae's concerns are not simply focused on their internal processes, but also on how they communicate with the customer. Once we are walking in the digital age, the group seeks to make their information available through the website and social networks, following the social trends. In addition, discount coupons are also distributed via email or through the *Continent app*. Sonae already presents very concrete and innovative ideas, but always with the eyes set on the future. The objectives are to keep focus on LED lighting in all stores, to continue efforts to reduce water consumption and to reduce waste as much as possible.

In the case of Os Mosqueteiros, the implementation of the “Guia das Boas Práticas Ambientais” has enabled not only the employees of the group but also all clients and partners to be educated. There is a clear bet on domestic producers and suppliers,

transmitted through the "Programa Origens", which supports and promotes national production, representing 16.5% of the group's sales. This commitment to suppliers is also reflected in training actions to educate employees on environmental and social issues, as well as the establishment of a platform for evaluation and monitoring of suppliers. The selection of suppliers is based on their concern with the environment, governance, territorial presence and social practices. In this way, the group intends to ensure that its producers of palm oil, exotic wood, cocoa, coffee and charcoal follow a sustainable production logic. In addition, to reduce greenhouse gas emissions, the group invested in a fleet of biogas trucks equipped with electric refrigeration, as well as a route management tool that reduces the distance travelled. Energy efficiency is a goal of Os Mosqueteiros, which aims to reduce global consumption by 30% by 2020 and to increase renewable energy by 10%. All the company's logistical bases and production units are certified by ISO 50001, which is an energy management standard that aims to certify effective management by companies. In this way, the group also shows concern about reducing electricity consumption by implementing LED lighting in its facilities. This concern is also extended to the consumption of water, since the company started to monitor water consumption at all points of sale. Through the partnership with the company SILVE, the group started to have an identity of collection of products and waste for recycling, so the plastics and paper are recovered and reused. In addition, the group has implemented terminals for collecting bulbs, batteries and small appliances at all points of sale. In the case of food, the group have partnered with the French Federation of Food Banks, allowing donation of several products that are at the end of the shelf life (and therefore of immediate consumption), or which do not comply with the standards of quality but are consumable. The group mainly bets on its web page to divulge all the information, campaigns or news, trying to keep its clients informed and permanently updated. Circular Economy is the future, and the group has this concept very present in its routines, with ambitious objectives in the short term. The focus on national producers, reduction of chemical compounds in food, traceability of raw materials and energy reduction are some of the main measures that the group plans to implement by 2025.

Aldi is the group that presents the greatest diversity of environmental policies to obtain raw materials, being them animals or forestry. The German group is the one with the greatest diversity of sustainable policies, seeking to obtain their raw materials in a balanced way, protecting the species and committing themselves to the working

conditions of the employees involved. The reduction of water consumption is also a very present issue within the group and has adopted several measures to conserve consumption through alternative techniques for self-cleaning of equipment, biodegradable detergents and the acquisition of plants that are adapted to the climate of each country, so they do not need too much water for their survival. The partnerships established by Aldi perfectly represent all the concerns the group has in supporting producers and suppliers to obtain the most qualified raw materials, while rewarding and supporting the members involved in its extraction, since most of them live and works in very precarious conditions. Accompanying the digital trends of today's world, the group developed the Aldi Transparency Code platform, where the customer can enter the code of their products and follow the route from the origin to the store. The sincerity with the client, makes processes much more transparent, cultivating a sense of trust and quality. In addition, the group decides to share all the production sites for clothing, home textiles and footwear of the own brands. There is also concern that all parties involved are aware of the processes of acquisition, processing and marketing of their products. The group is committed to enabling its customers to return to their stores products that are not in the best conditions. This measure is a very efficient loyalty strategy of the client, since it transmits some security to the consumer to return the products that are not in good condition, without any harm to the customer. In the case of food, Aldi has established partnerships with various charities organizations, such as the Luso-German Charitable Association, Re-Food Portugal, Montijo Food Support Network and Caritas Poland, to donate products that are no longer saleable, but which can still be consumed. In addition, the group has decided to sell end-of-life meat and fish products at lower prices to reduce waste. Such as in Jerónimo Martins and Sonae, the group started to provide reusable transport bags to reduce the excessive production of plastic. On the other hand, the group has committed to purchase products from its suppliers that are made of sustainable materials and free of PVC or other chemical compounds. In order to optimize routes and reduce fuel consumption on journeys, the group is concerned with studying the best transport routes and optimizing vehicles to be more efficient in freight transport. Through efficient route planning, the group only allowed their vehicles to leave the logistics centres with full cargo, reducing the number of trips required. By 2020, the group presents several proposals of value and sustainability, with the objective of obtaining international certifications that allow regularization of the extraction of raw materials according to certain environmental standards, such as wood, flowers, plants and black / green tea.

Auchan has also invested in the last years in several measures of sustainability and minimization of the environmental impact. The creation of the "Zero Waste" project effectively materializes all the group's ambitions to involve its employees and customers in reducing the environmental impact. Partnerships with charities such as Re-Food and Dar e Acordar are a good example of the group's concern to donate excesses and reduce waste, helping those who need it most. In addition, the group provides several ecopoints for in-store waste collection, allowing the customer to deposit different equipment, such as electronic appliances, cooking oils, lamps, batteries, among others. The implementation of the Sustainable Fish Trade Policy aims at obtaining in a rational and sustained manner all the marine raw material, looking for the suppliers that best comply with the sustainability standards established by Auchan, training employees and monitoring the collection and transport processes of the company, from the supplier to the retailer. All these concerns with stakeholders are due to the recognition of their importance and influence in the business, and so, they are identified according to the agreement with the AA1000 Stakeholder Engagement Standard. Audits are carried out annually to its suppliers, to safeguard compliance with the Code of Ethics and Conduct. Auchan's environmental concerns have enabled the creation of a web page dedicated specifically to customer communication of all the sustainable processes the group takes on, encourages savings and reduction of waste, and highlights the full range of organic products and eco-friendly products that are available in-store. Concern over the reduction of excesses allowed the group in 2016 to reduce by 2% in-store water consumption. The group allows its customers to return to the store products at the end of their life cycle, so they are evaluated according to their status. In the case of materials that have solution, these are repaired and returned to the consumer. If they are not repaired, they are sent to composting and recycling centres. Also, ecodesign is a very present topic within the group, which reduced the amount of raw materials used, and started to use only one material in its production, facilitating the recycling process. To optimize the logistic process, the group adopted cross docking, allowing the reduction of unnecessary distances travelled and consequent emissions, and reducing the excess of merchandise in the warehouse, since the merchandise flow was greater. On the other hand, in each transport vehicle the maximum possible load was conditioned, to reduce the number of trips. Auchan has made efforts to follow environmental concerns and introducing a circular economy model in its processes, by presenting ambitious proposals in this regard until 2030. Regulation of the extraction of natural resources, such as fish and agricultural

products, are essential factors for the reduction of the ecological footprint and the destruction of natural habitats. In addition, the group aims to reduce waste generation by increasing recycling, reducing waste and reusing materials. The group also intends to continue providing support and working conditions to producers and suppliers to encourage national production and improve the quality of products sold. All these measures are part of a training plan that Auchan intends to implement, with the aim of educating and sensitizing citizens from a very early age, so they begin to internalize the need to adopt sustainable and ecological methods in their daily routines.

5.2. Limitations

During the development of this thesis, I concluded that Circular Economy and environmental concerns are still taboo for some companies. In the planning of my master's thesis, I had the objective of developing a survey covering the largest number of retail companies in Portugal, to analyse how companies behave nowadays regarding these subjects, and what measures are already adopted concerning a Circular Economy model. However, during the contact with some companies, I realized that not all of them were available to participate in this survey, while they did not publicly disclose information about these subjects. Although Circular Economy and environmental concerns are a recurring theme today, not all companies are willing to engage in efforts to circumvent the environmental impact and prevent future damage that our actions may have. For many solutions and proposals that have been presented throughout this thesis, many of them involve some investment and high costs in its implementation. Obtaining alternative raw materials may be more difficult to extract, while mobilizing human resources, investing in R & D and equipment capable of recycling or filtering chemical compounds may be a barrier to some companies. The Circular Economy is a concept that involves a lot of study and improvement of techniques, that only with practice and continuous improvement can be correctly applied in the companies. In addition, many companies continue to show no concern for the working conditions of their workers, from producers, suppliers and even internal employees. The fact that some countries are a source of cheap manpower seduces many companies that see in these cases opportunities to obtain the necessary raw materials at very low costs and having incredibly higher sales returns. On the other hand, the fact that many fish do not have legislation prohibiting overfishing of certain marine

species means that some suppliers are free to not only destroy endangered habitats and endanger several protected species, but also to contaminate the oceans with chemicals and waste disposal.

5.3. Recommendations

After developing this theme, which is so current but at the same time so despised by society, I conclude that some companies already see Circular Economy as a mandatory model and solution for the future, while for other companies there is still a long way to go. It is important to recognize the importance that some companies give to protecting the environment, knowing that there are alternative ways to remain competitive in the market, while reducing the ecological footprint and environmental impact. However, in-company training becomes the top priority for CEOs of each retail group. It is essential that the example be given vertically, starting with the highest entity of each company, until it reaches the operational base. The Circular Economy cannot be just a model adopted by some departments, but must encompass the whole dynamics of the company, so each employee can apply this knowledge not only in work, but also in his life. Stakeholder involvement is also a key strategy, so all parties involved in the business can be an important asset in the development of the circular economy model.

Although some companies already adopt several internal sustainable measures, it is necessary to apply some of this knowledge in store. The application of 3D technology in the promotion of products in store is something quite present in some foreign countries, but in Portugal it is still not a reality. 3D technology would increase store space, while reducing the need to occupy space with displays or benches, creating a more appealing and dynamic effect on the promotion of articles. Also, the inclusion of mobile applications that can advertise campaigns and information about articles while customers are in-store would be a very interactive and engaging way to entice customers to easily find the articles they want while they are suggesting companion articles. Social networks and mobile applications are the future, allowing to reduce the amount of paper leaflets or advertising sustained in plastic.

Another important measure, currently used by some mail distribution companies, would be to implement the “Click-and-Collect” model so the consumers could carry out their purchases through the website or mobile applications, and then could move to the nearest

picking point to collect the items. This service would be much more convenient and faster, allowing to reduce the displacements of transport and subsequent consumption of fuel and emissions of gaseous pollutants.

One of the pillars for the success of any retail company is its supply chain, integrating its producers and suppliers. The greater the support given and the better the working conditions, the greater their productivity will be. The motivation of the suppliers is a fundamental part of the business, since they will be delineating the quality of the products, contributing to an image of trust, prestige and identity in the eyes of the customer. Thus, it is necessary that companies pay their employees properly, and create safety conditions in their work, since many of the activities of raw material extraction involve high life risks.

Just as the marketing, financial or logistics department is important within a company, setting up an R & D department is key to studying new trends and technologies in the struggle for reducing toxic waste and polluting emissions. It is important for the company to highlight this service in its processes, to commit to a more sustainable business model, free of chemical compounds, and considered as an example to follow within the business. Positive pioneering is an important basis for other companies to recognize the need to change their business model and increasing competitiveness within the ecological framework, and will help more companies to view Circular Economy as the key to the success.

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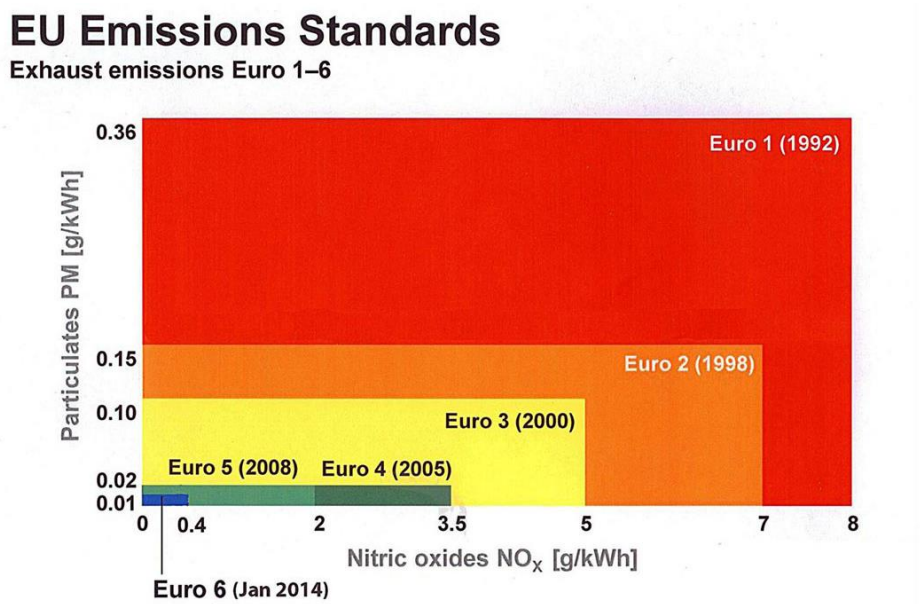
7. Annexes

Annex 1 – European Union Emissions Standards



Source: Doug Jack's Digital Repository; Available at: http://www.dougjack.co.uk/bus-industry-euro-6-emissions-limits.html; Accessed at 25 Aug. 2018

Annex 2 – Energy Efficiency in Jerónimo Martins

Technology	Number of Buildings	Energy Savings / Year	CO2 savings / year
Lighting posts powered from photovoltaic panels	1	72.000 kWh	28 t
Tubular solar light transport system	21	120.291 kWh	46 t
Solar collectors to produce hot water used for the heating of sanitary waters and / or in the air conditioning system	17	482.685 kWh	184 t
Geothermal heat pumps	13	1.523.014 kWh	519 t

Source: Adapted from Jerónimo Martins Relatório & Contas 2017

Annex 3 – Importance of Stakeholders for Jerónimo Martins

Subtitle:

1. Quality and Food Safety
2. Selection of Suppliers Based on Quality Criteria
3. Supply of Sustainable Products (fish, paper, wood, coffee, cocoa)
4. Working Conditions
5. Preference for Local Suppliers
6. Involvement and Support to Employees, Families and Local Communities
7. Healthy Products Offer
8. Waste Management
9. Reduction of Water Consumption
10. Supplier Relationship Management
11. Customer Service
12. Innovation in Products and Services
13. Packaging Material Reduction
14. Attraction, Retention of Talents, Training and Professional Development
15. Communication of Good Environmental and Social Practices
16. Mitigation of the Impacts of Biodiversity Operations
17. Nutrition Information Labeling
18. Reduction of Gases Emissions
19. Mission, Vision and Strategy
20. Waste Management
21. Composition of the Governance Model
22. Risk Management and Internal Control
23. Audit and Supervision (existence and independence of the Audit Committee)
24. Diversity and Gender Equality Practices
25. Remuneration Policies and Remuneration Committee

Source: Adapted from Jerónimo Martins website; Available at www.jeronimomartins.com/pt/responsabilidade/nossa-estrategia-de-responsabilidade/definindo-as-nossas-prioridades/; Accessed at 2 Sep. 2018