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M.A. Global Business Development

Term Paper

Implementation of circular business models as a solution to expand the local economy on the Canary Island of Tenerife while achieving sustainability goals



Course: International Relations

Submitted to
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Submitted by: Global Business Development Master Students (winter term 2021/22)

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Declaration of authorship of an academic paper

We hereby declare that we have written this paper ourselves and used no other sources or resources than those indicated, have clearly marked verbatim quotations as such, and clearly indicated the source of all paraphrased references.

Neither this paper nor any part of this paper is a part of any other material presented for examination at this or any other institution.

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1 Introduction

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1.1 Task description

“Throughout history, the Canary Islands have been described as “The Fortunate Islands,” “The Islands of Eternal Spring” or “The California of Europe.” This is not at all surprising when we consider that their average year-round temperature is 22°C (71.6°F). In fact, UNESCO declared the islands “the best place in the world to live.”” (Intech Tenerife 2021).

About six million tourists make the island to Europe’s leading destination. For doing business Tenerife has several advantages such as the advantage of the island’s strategic location between three continents. But a good location is nothing without connections, therefore Tenerife offers two international airports with flights to over 160 direct destinations serving over 12 million passengers per year. Another important point to mention is that the island is an international hub offering major cost and time savings. Moreover, the international ports connect to the rest of the world. Also, the location offers the possibility of accessing the Free Trade Zone (Whytenerife 2014).

Tenerife is dependent on the tourism business, but tourism causes negative impacts on the environment by for example using non-renewable energy and water resources extensively (González-Morales et. al. 2021: 11428-11429). For that reason, new ways of doing business in Tenerife should be considered.

As the take-use dispose system is failing, we need to move from our current economic model to a circular economy model, where resources are retained in the economy for as long as possible and waste is reduced by changing the way we produce and consume. Sustainability is becoming more and more important and everyone can benefit from this attitude. It is not just positive for the environment, but also for our economy as it minimizes dependency by making the supply chain shorter (Liu/ Ramakrishna 2021: Foreword).

To provide different perspectives for Tenerife on the Canary Island, excluding the tourism business, in the following various sustainable business ideas, based on the Circular Business Model, will be presented. In addition, theoretic models and methods have been applied.

1.2 Research Question

As all groups worked on a similar topic, namely one of the UNESCO Sustainability Goals, a unified research question can be formulated:

How can circular business model ideas (of German master students) be used to achieve the UN Sustainable Development Goals in Tenerife?

The different approaches of the various groups will be presented in the further course of this scientific paper. Initially, however, this paper is devoted to the goal and its description.

1.3 Goal description of this paper

The goal of this paper is to give an insight into the business ideas developed on Tenerife based on the circular economy concept and the Sustainable Development Goals of the United Nations. Therefore, a PESTEL-Analysis is conducted to research the suitability of the island Tenerife for circular economy projects. The intention is to show sustainable business possibilities on the island. The circular Business models from the Green Lizards, Waterlution, From Coffee to Cups and OceanSavers are explained in detail and with regard to their specific sustainability goal. The ideas were developed by applying business models and the circular economy approach. They are researched but could not be tested under real conditions. The business ideas are to be seen as basis for further research, idea creation and development under the circular economy model.

1.4 Structure of the paper

One aim of this paper is to identify the background of the Circular Economy, which is the basis of the projects. The starting point is the Sustainable Development Goals of the United Nations, on which the business ideas are based. Subsequently, a Pestel Analysis will be conducted to assess the environment for the development of the ideas more precisely and to identify external impacts. Furthermore, each group will describe its project in more detail. This includes the situation analysis, the development of the idea, the description of the products, a circular business model canvas, a SWOT-Analysis and an outlook for the future. Finally, the paper ends with a conclusion, which summarizes the content and answers the research question.

2 Fundamentals of circular economy

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Current circumstances in the context of climate change as well as a change in the consciousness of human production and consumption behaviour demand a rethink. The

transition between social and ecological-economic change is fluid. To ensure a responsible use of the earth's resources, a transformation from the linear economy to a circular economy is ultimately necessary. It is one of the cornerstones of the European Union's Green Deal and an important approach to resource efficiency and combating climate change. (Deloitte, BDI 2021: 6)

Lacy et al. define, that “in a circular economy, growth is decoupled from the consumption of scarce resources. Products and materials are kept within productive use for as long as possible, and when they reach the end of use, they are effectively cycled (or looped) back into the system. Arriving in a true circularity means rethinking and transforming full value chains to create a system in which waste is avoided entirely, and the goal is net positivity through restorative models.” (Lacy et al. 2020: 5f) Ideally, circular business models would evolve the conventional “take, make, dispose” in production and consumption into models that minimize or prevent waste, pollution, and inefficiencies (Lacy et al. 2020: 18) by sharing, leasing, reusing, repairing, refurbishing, and recycling existing materials and products, short: extending the life cycle of products. (European Commission 2020: 3)

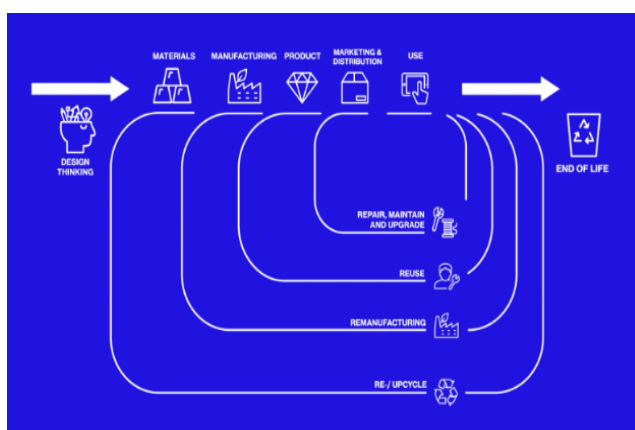


Figure 1: Circular Loops
Source: Fraunhofer IZM, 2018

A study by Deloitte and BDI examined the long-term effects of the circular economy: First, it is estimated that there will be an increase in value added and employment figures as well as a decrease in dependence on the import of resources. In addition, the environmental effects are greatly reduced through the saving of raw materials - however, a reduction of greenhouse gases is not to be expected, as the processing of secondary resources generates similar Co2 emissions as the saved supply chains. The realization of a circular economy requires both technological innovations and new developments in entrepreneurial business models. (Deloitte; BDI 2021: 9)

As shown in Figure 1, the linear supply chain is to be circularized by loops to retain value: Repair, Reuse, Remanufacture, Recycle. (Fraunhofer IZM: 2018) The value of the product is preserved to the greatest extent when it is repaired and maintained to its full use.

When it comes to extensions that are not recommended for maintenance, the components are reused or remanufactured. This approach retains greater value instead of recycling materials. (Sreedevi 2021: 45)

Possible models to include such "loops" in the value process can be: Circular Inputs, Sharing Platforms, Product Use Extension, Product as a Service and Resource Recovery.

To implement **Circular Input**, organizations must replace the "linear" type of resources in their supply chain with "circular" alternatives. These can be renewable resources, such as energy from sunlight, bio-based materials, for example clothing fibre, or man-made materials, which are recyclable without a great value loss. (Lacy et al. 2020: 24)

Sharing platforms are moving away from the idea of production, purchase, ownership. Regularly, certain goods are only needed for one-time or infrequent use. By building a community that can share goods with each other by renting out products at a compelling and affordable price, such platforms make maximum use of existing resources and assets. (Lacy et al. 2020: 22)

Based on a similar concept, the model **Product as a Service** also takes a step back from the idea of ownership: Instead, the companies retain the ownership of the product and sell its benefits based on service, while still being responsible for the maintenance and disposal of the product at the end of its use. With this approach, products are used by more clients through a pay-for-us or lease arrangement. (Lacy et al. 2020: 23)

The model **Product Use Extension** aims at optimizing and extending a used or obsolete object to prolong its use or to be able to offer it on the second-hand market. In this way, the product life cycle is extended, and the careless replacement of used equipment or products is counteracted. (Lacy et al. 2020: 24)

Resource Recovery, or Recycling, focuses on the end stage of the value chain, that is, at the end of use, recovering materials and resources from products that no longer work in the current application. (Lacy et al. 2020: 25)

In summary, circular economies aim at extending the product life cycle and transforming from a linear to a circular economy to ensure a responsible and sustainable use of existing resources, which will allow the Earth to remain a pleasant place to live with sufficient resources in the future. The implementation of such an economic model requires innovative and well-thought-out business models, as well as the will and motivation to elaborate and implement them.

3 Sustainability goals

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The 17 sustainable development goals of the United Nations are the outcome of almost 30 years of cooperation of several countries and the United Nations in order to improve human lives and protect the environment. Different contracts and agreements have covered numerous aspects of the same problems: poverty, hunger, and the destruction of the environment. In 2015 several major agreements to reach goals under this umbrella were signed, which made the year an outstanding one in terms of multilateralism and international policy shaping (United Nations 2021a).

In this year also the 2030 Agenda for Sustainable Development was adopted by all United Nations members as a specific action plan. It covers the five divisions of people, planet, prosperity, peace and partnership. It is aiming to end poverty and hunger and to establish good living conditions for everyone. Also, the agenda includes the protection of the environment regarding natural resources and climate change as well as ensuring that economic, social and technological progress comes in harmony with nature. In terms of peace the member states want to foster peaceful, just and inclusive societies under the absence of fear and violence. They agreed on working even closer together in a revitalised global partnership and to mobilize the means that are necessary to enforce and realize the 2030 Agenda for Sustainable Development (United Nations 2021b). Today the Division for Sustainable Development Goals (DSDG) within the United Nations Department of Economic and Social Affairs (UNDESA) provides support and capacity-building for the goals of the agenda (United Nations 2021a).

This agenda can be seen as a great break-through in the history of human, as almost all states worldwide are committed on tackling global problems. They have commonly acknowledged that every country is doing better and all people are better off, when every single person is having a better live in safety and prosperity – not only some single fortunate ones. It was realized that global challenges, like the climate change, are threatening the living conditions of everyone and that finding solutions to them can only be done in close partnership and cooperation.

The 17 specific goals can be seen in the picture below, which is the official one of the United Nations.



Figure 2: The 17 Sustainable Development Goals
Source: United Nations 2021a

4 PESTEL Analysis

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The PESTEL analysis is suitable as a method to analyze a certain environment. It examines and shows the opportunities and risks of a market in which a company is supposed to enter. This method considers six dimensions: political, economic, socio-cultural, technological and legal. In the following, the Canary Island of Tenerife is analyzed with the help of these six dimensions (Kaufmann 2021: 19).

4.1 Political influencing factors

It must be noted here that many political aspects do not directly concern Tenerife, but Spain and the Canary Islands. The Canary Islands are one of the 17 Autonomous Communities and belong politically to Spain, the European Union and the Eurozone. Geographically, the group of islands is located in the Atlantic Ocean, about 100 km from the African coast. Features such as investment promotion and the most favorable tax conditions in Europe make the Canary Islands a business location with great potential (AHK Spanien 2018). In 2018, a new Statute of Autonomy of the Canary Islands was approved. This is the first time that the sea is recognized as part of an Autonomous Community (European Institute Public Administration 2020). This change opens up many new opportunities for communities, as they have a greater voice in the use of the sea (Infos GranCanaria 2018). This concerns, for example, oil and gas drilling, the extraction of raw materials as well as questions of fishing in coastal waters (Umweltbundesamt 2013). Administratively, the Canary Islands are divided into two provinces: The province of Santa Cruz de Tenerife is formed by the western Canary Islands of Tenerife, La Palma, La Gomera and El Hierro, while the province of Las Palmas consists of Gran Canaria, Fuerteventura and Lanzarote. All of these seven main islands are governed by an Island Council (Cabildo Insular). The union of all the Cabildos forms the Mancomunidad de Cabildos (Goruma 2021).

Tenerife and the Canary Islands belong to Spain. Since the autonomous status in 1982, the Canary Islands belong to the EU, so that in addition to Spanish law, the European legal basis also comes into play (Tenerife Meercharmeur 2021). Nevertheless, the volcanic island has its own tax and economic system, which offers certain advantages to the resident companies and businesses (Goruma 2021). The capital of the autonomous region of Tenerife is Santa Cruz de Tenerife, which also serves as the administrative seat of the Spanish province of Santa Cruz de Tenerife (Tenerife Meercharmeur 2021). With the help of its own articulated system of government, many of the decisions that directly affect the Canarian population are made by local deputies (Spain Tenerife 2021).

In the Canary Islands Parliament, Tenerife is represented by 15 members (Webtenerife, 2021), who play a role in legislation, control of budgets and the appointment of deputies who present certain matters to the mainland. The island administration (Cabildo Insular) is empowered to some extent to govern itself and is responsible for the day-to-day operations of the local government (Spain Tenerife 2021). Each region (including the Canary Islands) has its own president, parliament and Supreme Court. In addition, each individual island has its own council, headed by a different president. As of July 2019, Pedro Manuel Martín Domínguez is the president of the Cabildo de Tenerife in Santa Cruz. The Plenum or "Chamber", composed of the President and 28 other island directors, is the main organ of the island government that politically represents the opinion of the citizens of Tenerife. Its functions include the control and supervision of all aspects of the island government (Tenerife Information Centre 2021).

The Operational Program for Community Structural Interventions, with the participation of the European Regional Development Fund (ERDF), aims to improve regional competitiveness and employment in the Autonomous Community of the Canary Islands. Support in catching up in the field of research and development and addressing structural obstacles to development are the focus (European Commission 2021a). The European Green Deals concept, introduced in 2019, means the transition to a modern, resource-efficient and competitive economy by 2050. The EU Commission wants to support this venture with a huge investment program of 1,000 billion euros (European Commission 2021b). In this context, Spain's new government declared a climate emergency. With the declaration, the cabinet took the first formal step to implement measures in the fight against global warming and to be in line with the European Union's plans (Zeit Online 2020).

4.2 Economic influencing factors

For a long time, the primary sector of the agricultural economy was the main pillar of the Canarian economy. Until 1853, wine from vines that grew on unirrigated slopes was the main product. But due to phylloxera soon the viticulture was replaced by cochineal production (iTenerife 2021). Towards the end of the 19th century, the cochineal industry declined due to

competition from synthetic dyes and was replaced by the cultivation of bananas, tomatoes, potatoes and other vegetables and fruits. Bananas, still the most important crop, are protected from foreign competition in the Spanish market. Exports in the field of tropical fruits like avocados or mangos are aimed towards trade with the EU mainland and national markets. The cultivation of flowers and plants is a new industry (Cabildo de Tenerife 2021).

However, for several decades now, the island's economy is no longer purely agricultural. Nowadays, the economic panorama of the island is strongly dominated by the tertiary sector. Representing 74.6% of the economy, the tourism sector has a very strong impact on Tenerife (Cabildo de Tenerife 2021). Typically, Tenerife welcomes around five million visitors per year. That number drastically declined in 2020 due to the impact of the coronavirus (Expact 2021). The industry sector is sparse and represents around 7 or 8% of the national GDP, largely in the agri-food transformation, tobacco, and oil refining sectors (iTenerife 2021).

Tenerife has a very strategic location between Africa, Europe and America that offers competitive operating costs, investment opportunities, an innovative infrastructure as well as a high quality of life (WhyTenerife? 2021). The good standard of living can be seen in the high Human development index (HDI) of 0.871, just under the average of 0.904 in Spain (GlobalDataLab 2019). The HDI is calculated using indicators like education, the gross national income as well as the life expectancy in years and shows how socially developed a country is (BBC 2021). Any country with a score between 0.8 and 1.0 is considered a country with very high human development, including the Canary Islands. Germany in comparison has a HDI of 0.948 (Worldpopulationreview 2021/ GlobalDataLab 2019).

Nevertheless, the biggest economic advantage of Tenerife lies in the Canary Island Economic and Tax Regime that guarantees outstanding conditions for investment and trade. Together with the other Canary Islands, Tenerife is part of the Canary Islands Zone (Zona Especial Canarias), short ZEC, a low tax zone approved by the EU to promote economic and social development on the Islands (Canarias ZEC 2019). ZEC entity companies benefit from a reduced corporate income tax of only 4% and Value Added Tax (VAT) of 7%, compared to the EU average of 20% and 19% VAT of Spain mainland (WhyTenerife? 2021). To benefit from the advantages of a ZEC entity companies must fulfill certain requirements that are specified by the government.

The labour market of the Canary Islands is dominated by small and micro-sized businesses (EURES 2021). Roughly 58% of all companies on the Islands employ no people at all and around 38% have only one to nine employees. The average salary per year is around 24.500€, 9,26% less than mainland Spain, which is lower than most of the other European countries. However, the cost of living is also lower compared to its neighbor countries (Average Salary Survey 2021 and Janicke 2021). Following Corona related layoffs, the labour market will be

challenging in the future due to higher competition. Nevertheless, people will find opportunities in the tourist, teaching, agriculture and construction sector. The jobs that will be hard to fill are mainly in the healthcare and manufacturing sector (Expat 2021).

With the service sector being the main pillar of the economy, Tenerife was hit hard by the COVID-19 pandemic. The present economic situation is mainly caused by its severe impact. Compared to 2019, tourist visits were down 63% in 2020 (EURES 2021). This resulted in many businesses closing and the unemployment rate rising over 24% in all business sectors to 22.6% at the end of 2020 (EXPAT 2021).

Even though the economic situation has already improved with the relaxation of travel restrictions in Europe, the uncertainty about the further development of the pandemic and how it will further affect the economy and employment is a big challenge for Tenerife (Canarian Weekly 2021). Especially tourism and consumption but also investments can help push the economy through 2021 (BBVA Research 2021).

4.3 Social influencing factors

In the following section, some important factors of the social conditions on Tenerife and the canary islands are presented.

Tenerife is the most populated island in the Canary Islands with over 928.000 inhabitants. During the last five years, the island just gained over 40.000 new inhabitants. The main cause of the growth is more immigration, less natural growth. This increase is concentrated mainly in the cities of Santa Cruz and La Laguna (Canarian Weekly 2021).

The current population of the Canary Islands is composed of Europeans, North Africans, and Sub-Saharan Africans, with a small amount of Amerindian input (Fregel/Ordóñez/Serrano 2021). The inhabitant's average age is about 42 years and the proportion of men and women is almost equal (UrbiStat 2021).

In 2019, the average gross income was around 21.000 euros. This makes the level of income on the Canary Islands the second lowest in Spain (Canarian Weekly 2020).

Tenerife's official language is Spanish. Typical Spanish in Tenerife is spoken with a dialect similar to Cuban and Puerto Rican (Ramm 2021).

Health care in Tenerife is part of the overall European Unified System. The administration is the exclusive responsibility of the Servicio Canario de Salud, which is subordinate to the Government of the Canary Islands. Every European citizen is entitled to free medical care in the Canary Islands, regardless of the cost or length of treatment (The Tenerife Information Centre 2021).

Religion is also part of the social framework. There is no official religion in Tenerife, but the majority of the population belongs to Roman Catholicism. A small percentage of the population professes to be Protestant Christians or Muslims (Ramm 2021). Spanish life has changed rapidly in recent years and many of the strict religious customs have been replaced by more modern living, especially in the cities and among women. Nevertheless, traditions such as hospitality, chivalry, and courtesy remain strong (World Travel Guide 2019).

Tenerife society can be described as warm, friendly, and relaxed. The inhabitants are used to many different nationalities visiting the country. Society is composed of a good ethical mix of people (SpainTenerife 2021).

The island is also known for its celebrations. The locals enjoy dressing up in their traditional costumes for festivities and singing and dancing together (SpainTenerife 2021).

4.4 Technological influencing factors

When considering a business idea, it is important to examine the technological resources of the target destination. This includes the physical and digital infrastructure, as well as the research and development institutions (Business Wissen 2021).

Considering the physical infrastructure, Tenerife relies heavily on transportation by air or sea, as it is an island without bridges connecting it to another continent. Due to that, the expansion of physical infrastructure is significant for the connectivity of the island. Tenerife has two international airports with flights to 160 destinations and five ports (WhyTenerife 2020). The container terminals of the cargo ports stand out for their modernity and operate to the highest European quality, safety and security standards. Tenerife has excellent maritime connectivity and is Europe's second-largest power in container port movement and eleventh in a worldwide comparison (Port Authority of Santa Cruz de Tenerife 2021).

The transport on the island depends heavily on buses. At the moment there is no rail network except for a 12 km tram system, which currently includes two tram lines. However, this is to be further expanded in the future (Gequo 2021).

The existent digital infrastructure of the target destination is highly relevant for anybody considering investing, especially the availability of high-speed internet. Despite its isolated location as an island, Tenerife has high-speed fiber optic internet, which provides the residents with a broadband speed of 55.21 Mbps which is 5% above the Spain national average (FairInternetReport 2021). The high-speed internet is provided by a transatlantic fiber optic cable to Africa, mainland Spain, North- and South America, with the target to transform Tenerife into a communication hub (bnamericas 2021).

Concerning the research and development institutions, the island developed an attractive market, to test new technologies. It offers an environment that enables research, development and deployment of solutions and services worldwide. This is due to its excellent communication infrastructure and modern data connectivity. Moreover, the Canary Islands have their own network of Science and Technology Parks. One that stands out among them is INtech in Tenerife, which provides a high-quality environment with 600,000 m² of space for innovative and technology-driven companies. The island features state-of-the-art scientific facilities and cutting-edge research centers in areas such as renewable energies and environmental management. Another aspect that encourages the research in renewable energies is the fact that Tenerife has the most hours of daylight in Europe, which makes it an excellent place for photovoltaic plants (WhyTenerife 2021). The Tenerife-based ITER Institute (Center for Information, Technology and Renewable Energies) also promotes research in the field of renewable energies. ITER has three wind farms, a wind tunnel, and numerous photovoltaic plants. In addition, ITER operates a supercomputer that is the second most powerful computer in Spain and has the computing power of 10,000 commercial computers (SPET, Turismo de Tenerife, S.A. 2021). To further advance and modernize the state of technology and digitization in Tenerife, the government will invest 23 million euros in this field (Tenerife Inside 2020).

Although Tenerife is not yet known as an attractive business location due to its isolated location, the island has a very good digital infrastructure, research capacity and expertise, especially in the field of renewable energy. Furthermore, Tenerife is very well connected to other continents and due to the planned investments, the technological capabilities of the island will improve over the next few years, probably turning it into an interesting business location.

4.5 Ecological influencing factors

This point of the PESTEL analysis refers to the ecological factors of the island. All factors related to nature, climate, resources and health are considered (Fleig 2021).

The Canary Island of Tenerife belongs to Spain, although it is located 1300 km southwest of the Spanish mainland. Moreover, it is the main island of the Canary Islands. The capital of the island is Santa Cruz de Tenerife. Topographically, the volcanic island belongs to Africa and is located 250km west of Morocco and the Sahara in the Atlantic Ocean. With about 900,000 inhabitants, the Tinerfeños, the approximately 2000km² large island is the most populous island in Spain (Bornewasser 2018).

The climate on the island is oceanic-tropical, which means that it is mild all year round. Tenerife is therefore also called the island of constant spring (reise-klima.de n.d.)

In the middle of the island rises the volcano Teide, which with 3,718m height is considered the highest mountain in Spain. He is also the reason why the weather differs in the north and south of the island. From the north, trade winds constantly reach the island, bringing clouds with them. These clouds remain in the peaks of Mount Teide and rarely reach the south of the island (Budde 2012).

Therefore, the north is much cooler and rainier, which is also reflected in the vegetation. This changes above all with the height of the location, as shown in Figure 3 (Casa Aguacate 2021).

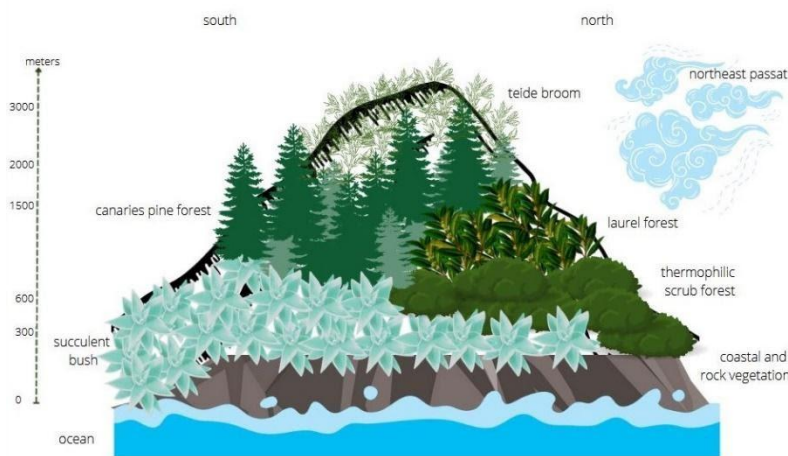


Figure 3: Vegetation zones Tenerife

Source: Own illustration based on Casa Aquate, 2021

The trade winds are also responsible for protecting the island from drought and heat, which are mainly caused by heat waves from the Sahara. These heat waves come to the island mainly in spring and autumn, bringing with them a lot of dust. This dust can become a nuisance, which has often led to airports having to be closed briefly due to poor visibility (Budde 2012; Hernandez et al. 2018: 29).

Tenerife has two airports, Tenerife North in the north and Reina Sofia in the south. In addition, the island has two main harbours, one in the south in Los Cristianos and a commercial port in the capital Santa Cruz. Furthermore, the island has a very well-developed road network as well as streetcar lines. And the local company Titsa operates the public, well extended bus network on Tenerife (Gequo GmbH n.d.).

Natural resources are scarce in the Canary Islands. In particular, drinking water is scarce, due to tourism, agriculture and, above all, deforestation. The main source of water supply on the island is therefore groundwater. In addition, there are seawater desalination plants to ensure the water supply. In Tenerife, solar and wind are often used for energy production, which is mainly explored by the local company ITER (Gequo GmbH n.d.; teneriffa-heute 2020).

Nevertheless, the energy supply on the island is mostly petroleum, alternative energies unfortunately do not even reach 10% penetration. So, as you can see, resources are scarce, which can be seen by the fact that the Canary Islands could feed themselves from their own natural resources for only two weeks with their current consumption patterns. So, the consumption pattern is extremely strong. This can be seen, for example, in the fact that there are more registered cars than people with driving licenses on the island (teneriffa-heute 2020).

Unfortunately, air pollution in Tenerife is a very problematic issue. Studies have shown that the bad air in Tenerife is associated with health problems (López-Villarubia et al. 2010:10). The biggest factors of air pollution are on the eastern coast of the island and consist of the port and oil refinery in Santa Cruz, the caletillas and granadilla power plants (Hernandez et al. 2018: 29). In addition, greenhouse gas emissions have increased dramatically as more and more flights land on the island due to ever increasing numbers of tourists, and therefore more emissions are generated (teneriffa-heute 2020).

4.6 Legal influencing factors

Another important factor that influences the way of working of every business are the rules and regulations in place. Therefore, in the last part of the PESTEL analysis, the legal factors in Tenerife are analysed. To a large extent, Tenerife is subject to the same regulations as the other Canary Islands, which is why they are analysed jointly in the following section.

The Canary Islands are part of Spain, which is governed by a parliamentary monarchy. The country is organized in a decentralised system with 17 Autonomous Communities that adopt their own bylaws and have defined legislative powers. The Canary Islands, as one of the autonomous regions, have their own parliament based in Santa Cruz de Tenerife. This concept is implemented by having nationally important issues such as immigration, foreign trade and monetary policies decided by the central government in Madrid. Whereas the parliament of the Autonomous Communities in Tenerife has autonomy in areas like urbanism and housing, regional transport, agriculture and fisheries. In addition, in 2018, the Canary Islands became the first autonomous community in which the sea was recognised as part of the territory and thus became a jurisdiction. Possible conflicts about regional and central competencies are determined by the constitutional court (European Committee of the Regions 2021).

As Spain is part of the European Union (EU), this also applies to the Canary Islands, meaning they are also under EU jurisdiction. On the one hand, this means additional regulations and laws, for example in the area of data security, environmental protection or product quality. On the other hand, membership in the EU brings many advantages, especially for companies,

such as access to the EU's single market and the many existing free trade agreements. (Pilati et al 2020).

Within the EU the Canary Islands are belonging to and classified as outermost region. The outermost regions are additionally supported by the EU to tackle major challenges caused to their small size and remoteness (European Commission 2021). Particularly important for the Canary Islands in this context is the Canary Islands Special Zone, which is in force since 2000 and offers both corporate tax and value added tax advantages (Canarias ZEC 2021).

In conclusion, the Canary Islands are in a stable legal position as part of Spain and member of the European Union. For businesses, the islands offer a very attractive situation due to the above-mentioned stability in combination with the favorable, special regulations for the canaries.

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5 Circular Business Models

5.1 Green Lizards

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5.1.1 Description of the idea

“Green LIZARD Bricks” came from the idea of generating something sustainable for the island of Tenerife - at best within the framework of Circular Economy. The basic concept was first developed at the end of the 80s, since then it has been continuously developed. “The idea [...] was put forward that efforts to reduce resource consumption and emissions should not primarily focus on making society less bad. Instead, the authors argue that all individuals need to strive to make a positive impact on the environment and society as a whole.” (Larsson 2018, p. 22) With this in mind the group consisting of Benedikt Holzmann, Christian Veit and Georg Schmidt developed the “Green LIZARD Bricks”.

Basically it is a smart plant pot. The flower pot is made of plastic, which doesn't sound very sustainable at first. But the island of Tenerife has been struggling with plastic waste, on land and in the sea, for decades. The project uses this plastic waste to create new flower pots. For this purpose, two additional local organizations were contacted. On the one hand, "Océano Limpio Tenerife", which cleans the sea around the island from plastic waste and collects litter from the beach and the water. On the other hand, "Precious Plastic" (Gran Canaria), which produces all kinds of objects from plastic waste - for example tables or chairs. Accordingly, flower pots should not be a problem. In order for something to grow in the flower pots, the seeds need soil. How fitting that the Canary Islands are home to several volcanoes, some active and some that have been inactive for some time. Only in late summer 2021 was a volcano on La Palma active for longer. The volcanoes and their activity are therefore crucial for the project, as volcanic soil is highly fertile and thus provides a perfect breeding ground for the plants. Yet again, all directly from the Canary Islands.

However, the added value is not provided by the flower pot alone, but by the community that stands behind “Green LIZARD”. A QR code is printed on each brick, allowing the buyer to

become part of a community. Tutorials, challenges or chats are possible there. Other premium content is also integrated, for example push-notifications for when to water your plant.

After the plant has been harvested, there are two options. The plant can be reused in a flower pot, as the online platform provides all the information on plant cultivation. If the person is no longer interested, the pots are collected, restored and reused for the future. Since they are already made of plastic waste that has already been recycled, this is possible again and again in the future.

The idea for the “Green LIZARD Bricks” developed under the guise of the Sustainable Development Goal "Sustainable Cities". The “Green LIZARD Bricks” are used to green up Tenerife's inner cities and thus automatically contribute to the aforementioned Sustainable Development Goal.

5.1.2 Business idea development

The idea came about slowly and in a roundabout way. At the beginning, no one could have seen the direction it could take. The design thinking process began simply with a ranking of the Sustainable Development Goals. Since the team consisted of only a few people who had, however, already travelled to every continent several times together, the topic of sustainable cities came to the centre of attention. After a few meetings and discussions, the team unfortunately lost a team member, but still it was able to support the group with impressions up to this point. So far, the aim was to make urban areas, which the team had mainly travelled to, more sustainable. To alleviate or even stop the symptoms of pollution where simply most people live, in cities.

The further course of the process was shaped by working out a persona, which could be used to better understand people's problems. A person who is strongly connected with nature, has a high standard of education, works in the field of education and is even committed to children and education. This person who systematically aims to make cities more sustainable and thus create a better world in the long run, understands that there is not only one solution or product for this problem.



Figure 4: Persona Leon
Source: Own illustration

There has to be a sustainable change in people's behaviour, what you have to lead people into. The first ideas arose from these two fixed points, the sustainable goal and the persona. Thanks to a lot of feedback, also from the other groups of the tenerife island project and external interview partners, dead ends in the idea generation process were cleared. The final idea was born directly on site and in the situation and environment of the island. The buildings on Tenerife offer large areas on the roofs and many open areas like balconies for cooling. However, the large house fronts are always bare. The many parks in the cities offer green spaces, but these contrast sharply with the buildings. After surveys of not only young people, students, who are easy to find at the university, but also middle-aged people, the realization emerges that due to the strong wind, people do not build extensions on the many existing balconies. In addition, many people are inspired by nature in the parks and also find relaxation there, but have not yet been able to find the time and leisure to become active themselves.



Figure 5: Tenerife
Source: Own illustration

Ultimately, it was the combination of the theoretical design thinking process and the field analysis, the survey, that focused the ideas in one direction. So if you take the factors of nature and cities together, add people living in them who only have to overcome small hurdles to get closer to nature or to bring nature closer to people, the result can be the following: On the one hand a product has to be created that has to be robust and functional, for example to withstand the weather, due to the strong winds of Tenerife. And on the other hand, a community has to be created that playfully creates the education necessary to take care of the plants and activates little smart helpers that make gardening as easy and pleasant as possible.

5.1.3 Business Model Canvas

There are a few ways to present and clarify the business model of a company or start-up. One of these options is the Business Model Canvas. It is a tool with which a business idea can be explained very well and simply. In addition, it is flexible, can be understood by everyone and is also well suited to further develop the existing business model. (strategyzer.com 2021) To clarify the business model of Green LIZARD Bricks and to evaluate the potential of this business idea, the Business Model Canvas was therefore used.

Value Proposition

The concept of the Green LIZARD Bricks aims to make the city more sustainable and includes several benefits for the customers. On the one hand, the installation of the Green LIZARD Bricks brings nature into the city and the often grey concrete walls of the buildings in Santa Cruz become greener. The cityscape is thus positively influenced and also creates a certain sustainable awareness among the population, which leads to a higher sense of well-being.

The use of the product is relatively simple for the customer, because the Green LIZARD Bricks is equipped with sensors. Connected to a smartphone, the brick sends the user all the relevant information that the customer needs for proper care of the plants. And the plug-in system of the plant pots allows for easy assembly and can be extended by as many Green LIZARD Bricks as desired.

Education is also an essential factor of the product. Each Green LIZARD Brick has a QR code that gives the customer access to the digital platform where customers not only can buy more products. Furthermore, the platform offers the customer additional value. The content of the platform consists of current educational videos on the topic of sustainability. Furthermore, customers are also informed there about current sustainable projects on Tenerife. In addition, a community can develop from this, because the platform offers customers the opportunity to network and exchange ideas with like-minded people. This creates a place where new ideas are generated, and projects are promoted that lead to more sustainable cities on Tenerife.

Key activities

First investors have to be found. Then the most important activities to realize this business model are the production and marketing of the Green LIZARD Bricks. For the production it is important to find local raw material suppliers and to develop the production process. To carry out the project, we must check whether we can act as a producer ourselves and set up a production facility, or whether it would make more sense to have the production carried out by external business partners (for example “Precious Plastic on Gran Canaria”). In addition, suitable suppliers for electronic sensors must be found and for marketing, it is important to establish contact with local influencers.

The online platform is an important part of our product and generates a high added value for the customer. Therefore, IT specialists must be hired for the programming and maintenance of the platform. We want a platform that is user-friendly and perfectly geared to the needs of the users. A lot of time and work must be invested until this goal is achieved. Subsequently, customer feedback must be integrated again and again, and the platform must be constantly updated and improved.

Key Resources

Some resources are fundamentally important for the Green LIZARD Bricks. These are primarily the raw materials required and the associated suppliers for these raw materials. Our key resources are therefore the recycled plastic, the seeds, and the nutrient-rich volcano soil. The raw material can be sourced directly from Tenerife. Apart from that, start-up capital is important and needed to begin the business. Of course, human capital is also an important resource of our business idea. Above all, the committed influencers are particularly important, as sales success will depend heavily on them.

Key Partners

As we are very keen to produce our product as sustainably as possible, it is important for us to source as many of the resources we need from the island itself. That is why we see the raw material suppliers as the key partners of our business idea. Therefore, a very good relationship based on trust and fairness must be established, especially with the raw material suppliers. As already mentioned, influencers play a fundamental role in the marketing of the product and therefore also count as key partners. The decision about who is allowed to market our product must be well thought out.

Customer Segment

At the beginning, the concept is aimed at all city dwellers on Tenerife, who can bring nature home with our product. Since we also operate a platform that is part of the product and offers the customer a clear added value, all other residents of Tenerife will also be part of the target

group as awareness grows. Moreover, the product is not limited to Tenerife. It can be established globally, with regional platform solutions.

Customer Relationship

The Green LIZARD Brick is not only bought by customers to bring nature home, but also because of the educational offer and content of the platform. The needs of the customer and the user experience are our focus. A close customer relationship is necessary in order to identify the customer's needs and meet their expectations.

Channels

We know our product best and also what makes our product special. When it comes to marketing, as we have already mentioned several times, we rely on influencers who we think can best support our vision. We want to keep the sale of the Green LIZARD Bricks in our own hands and therefore no dealers are commissioned. The buying behavior of customers has changed. More and more people are shopping online (Statistisches Bundesamt 2021) We therefore rely on direct online sales via our manufacturer e-commerce website.

Cost Structure

The Green LIZARD Bricks will not cost much to produce because the materials and electrical sensors used are not expensive and production is not particularly complicated. The most important and highest expenses, without which the business model would not work, will be the expenses for the development of the platform. The amount of this expenditure can vary greatly during the development process and is therefore difficult to estimate.

5.1.4 Circular Economy Business Model

Within this paper it was already established that the main focus of the whole project was to increase sustainability and therefore circular business models obviously make the most sense. In fact, focusing on circular economy practices is becoming visibly more popular in supply chain firms. A 2019 worldwide survey shows that about one in three companies already integrated circular design approaches into their respective innovation strategies. On top of that, roughly 40 percent intend to implement such an approach into their strategy until 2021 (Appendix: Table Nr 1 – Strategy survey 2021). The shift in the population's mindset is already visible and in full effect. For a deeper understanding this paper will dive into a close definition of what circular business models are.

5.1.4.1 Definition

It'd be ideal for humanity as a whole to work within a circular economy, which means to focus more on recycling and reusing. "A circular economy is an economic system where production and distribution are organized to use and re-use the same resources over and over again. The

present system consists of linear flows, where resources in most cases are used once, made into products that after they have been used end up in a landfill. Some materials are recycled, but the focus is on materials recycling and the properties and the value that products are endowed with through elaborate production processes are lost.” (Larsson 2018, p. 12-13) For these circular economies to work there’s a need for circular business models, which can be implemented into the firms. “A circular business model articulates the logic of how an organization creates, offers and delivers value to its broader range of stakeholders while minimizing ecological and social costs.” (Sustainabilityguide 2018) However it is a huge step for every company which decides to change towards circular business models. “The move to a circular business model is an example of a fundamental change, which requires a new way of thinking and doing business.” (Sustainabilityguide 2018) There is a business behind implementing those strategies into existing companies, which would be off the charts to go into more detail as part of this paper. Therefore, this research will present the three basic strategies for circularity. From top to bottom this table lists the following: The name of the strategy, how does it work? Who could benefit from it? And it ends with one example (Harvard 2021).

Usually, a combination of some sort is the way to unlock the most value for one company. Two key questions in this regard are: “How easy is it to get my product back?” and “How easy is it to recover value from my product?” Based on the responses to these two questions another tool (Circularity Matrix) can be used to develop the most fitting strategy. Depending on the firms’ capabilities and competitive context the strategies can be formulated. The Circularity Matrix (Appendix: Graph 1 - Circularity Matrix) is split into four categories easy/hard access and easy/hard process, within those categories the further divides the categories depending on their values low/high. The assessment of one's own values in terms of value, access and process are of course subjective, which is why thorough preparatory work is necessary to obtain the best possible strategy (Harvard 2021).

Table 1: Retain product ownership

Retain product ownership	Product life extension	Design for recycling
Renting or leasing the product to the customer rather than selling it	Designing products to last longer	Redesign existing products to maximize recoverability
Companies that offer complex products with a lot of embedded value Simple products that are expensive and seldom needed (tuxedos for proms)	Companies with durability as one of their key competitive differentiator	Basically everywhere – if parts of the product can be replaced with something more sustainable
Xerox – leased printers and photocopiers to corporate customers	Miele – luxury home-appliance company	Adidas – use plastic waste for shoe production

5.1.4.2 Green LIZARD Bricks

As described in 3.1, the “Green LIZARD Brick” is a product that was conceived from the beginning within a “Circular Economy”. The material used to make the flower pots is basically rubbish. The plastic waste that washes ashore is collected, processed and thus given new life. The infrastructure for this is already in place in Tenerife. The two organizations "Océano Limpio Tenerife" and "Precious Plastic" are already working in precisely this field. With the help of the flower pots, city centers are becoming greener. That in itself has several advantages. Visually alone, green balconies look much better than bare balconies. More plants also means a reduction in carbon dioxide emissions. In addition, plants help regulate the temperature of the atmosphere. On a smaller scale, the insect world also benefits from the larger selection of flowers to pollinate. By using volcanic soil from the Canary Islands to plant the seeds, another part of the product is used from nature. In this way, even from environmental disasters, such as a volcanic eruption, something positive can be gained. However, through the integrated QR code and the associated access to the Green-LIZARD-Community, the main focus of the product is on education. The Green LIZARD Brick basically explains from the very beginning how a seed becomes a tomato - for example. The inhabitants of Tenerife are educated on how much effort is needed to grow one single tomato. To achieve this, the right amount of water must be used. So the correct use of drinking water is also part of the educational experience. Even after the harvest, Green LIZARD Bricks continue to be sustainable. The plastic pots can be reused or returned. This way, they can always start the life cycle all over again.

5.1.4.3 Implementation

Finally, the project “Green LIZARD Bricks” carried out is embedded in the theory at hand. As already mentioned, circular economy means that the economic system is organized in such a way that as many resources as possible can be used again and again. (Larsson 2018, p. 12) As the “Green-LIZARD-Brick-Project had not existed before, this could be included in the planning. The fabrication from plastic waste, coupled with the return option after use, implies that there will be almost no by-products in the production. The collected plastic waste is processed into a flower pot and can be reused as this as often as necessary until the plastic has worn out completely. The concept of Green LIZARD Bricks also corresponds to the Sustainability Guide's definition of circular business models. It minimizes ecological and social costs and at the same time offers a huge range of services for the stakeholders already mentioned. In terms of strategy, this work still needs to define access, process and value according to the “Circularity Matrix” (Appendix: Graph 1 - Circularity Matrix). Access is “easy”. Collection of plastic waste on the beach and in the sea is done by an organization (Océano Limpio Tenerife) that specializes in just that. For this purpose, volcanic soil can be found on all Canary Islands. The production process is similar. Here, too, an organization (Precious Plastic)

has been won as a partner that breathes new life into plastic waste. So here, as well, the category to be classified is “easy”. In terms of value, the platform with community and learning experience comes into play. As this makes an important and significant contribution to the education of the inhabitants of Tenerife, the value is to be classified as high, as this sustainably raises awareness. Therefore, a combination of Product Life Extension (PLE) and Design For Recycling (DFR) is the direction for the future. PLE focuses on making the plastic pots last as long as possible, thus establishing durability as a quality feature. In addition, with DFR in the strategy, further attention will be paid to recyclable resources in future product variations. Currently, almost all components of the flower pots are sustainable and recyclable, but over time, further potential can be discovered here as well. In summary, it can be said that, based on the present theory, the project can be classified as a circular business model. In combination with the strategy developed from the matrix, the project can have a sustainable direct impact on the island of Tenerife – both educationally and in terms of sustainability. Nevertheless, the project also faces challenges, which are highlighted in the following point.

5.1.5 Challenges and Opportunities

The goal is to celebrate great successes in the medium term. In one year after the release of the product range and the learning platform, sustainability-oriented organizations should not only have been made aware of, but ideally, they should also have achieved successes such as awards.

Cities bring people together in large masses and therefore are exactly the right basis to start with sustainability. This is where life takes place, so sustainability is most important here. Also, the goal of making cities more sustainable is not just a stand-alone goal, but rather an interface that can change people's behavior. Thus, it is linked to the other sustainable goals in several ways. In the same way, Green LIZARD's haptic products, especially the bricks, are intended to offer an open platform that promotes further innovative ideas and can unleash a revolution like the containers did to logistics in the 1950s.

The biggest challenge will be to become the standard - the go-to-brand so to speak. Because the form is simple and can be improved without a special patent, there is a great attraction for private individuals as well as companies to further develop the idea in an explosive way. For example, other cities with different framework conditions certainly need other modifications than a windbreak for tomatoes or the particularly strong holding devices that are necessary for Tenerife and its strong winds. However, Green LIZARD will always be able to offer an optimal high-quality basic build brick, but what modifications are then still possible is not even conceivable now.

The Standard Brick is not only accompanied but also supported by a community, which binds people to the product with great effects. You can not only buy bricks under one label, but also official modifications such as humidity sensors or wind sensors, which transmit the necessary information to an app, but also be part of a movement. A movement that continues to research, grows plants, optimizes irrigation systems in a playful and practical way, or simply eats a salad every now and then.

5.1.6 Critical evaluation

After the pitch in front of a jury, the project was accused of not thinking big enough. However, the simplicity of the idea played a significant role in the successful implementation of the pitch. A smart flower pot. One of the suggestions for further improvement was a cryptocurrency that would be implemented on the platform. Since a programmer, or even a whole team, will be needed to start the project, the step towards cryptocurrency is not impossible either. The expertise of a financial advisor can be called upon for this as well. However, the fact that the product strikes a nerve with the citizens of Tenerife is proven by the reaction of a homeowner who was present. He explained that he owns several houses on Tenerife and is very enthusiastic about the vision of all his house facades being covered with green plants. One of his main arguments was that this would cause the value of the respective properties to shoot through the roof. He even went so far as to sign a "contract" agreeing that the project would be implemented (Photo 1 - Contract). Contract has been deliberately put in quotation marks in this context, as it is not a legally binding document. Nevertheless, his immediate signature shows the existing and immediate interest in the Green LIZARD Bricks. Not only the homeowner was immediately convinced, but a professor from the Humboldt Cosmos Multiversity who was present was also enthusiastic about the idea and approached the group to see if there were any plans to implement it concretely. The first step towards a cooperation with those two have been launched already.

In summary, this shows that both the locals and the scientific community are interested in implementing the project. It also meets the requirements of a Circular Economy. The foundation was developed in Tenerife together with the professors, companies and locals. With the necessary theory, an initial direction for the future could also be presented. Accordingly, there is little standing in the way of actual implementation on the island, as has been weighed up against the challenges and criticism. The Green-LIZARD-Project-Group is currently still in contact with interested parties, which is the greatest proof of triumph in the argumentation for a successful project.

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5.1.8 Appendix

Table 1: Strategy Survey (Statista 2019)

Characteristic	Current state	Within next two years	Beyond next two years	No plans
Implement circular approaches in innovation strategy	28%	39%	22%	11%
Integrate circular economy into existing business units and growth strategies	27%	37%	24%	12%
Integrate access to end-of-life products into logistics strategy	24%	38%	21%	17%
Create separate business unit for circular economy activities to drive growth	17%	20%	18%	45%
Integrate circular economy skills in talent strategy	16%	39%	23%	22%
Link circular economy to digital technology	12%	43%	26%	19%

Graph 1: Circularity Matrix (Harvard 2021)

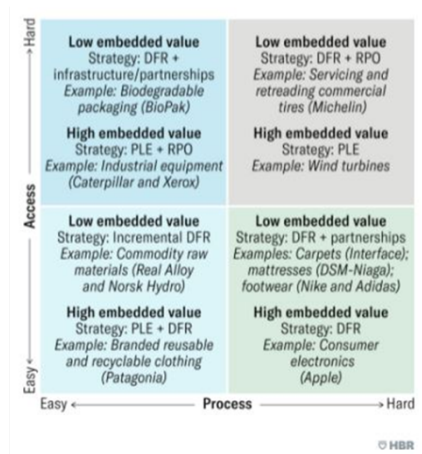


Photo 1: Contract (by private)

Contrato de colaboración

Yo Massimo
quiero colaborar
con "Green Lizards"
en el proyecto de las
macetas

Firma Massimo

<u>Chris</u> CEO	<u>Greg</u> CEO	<u>Rene</u> CEO
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5.2 Waterlution

Submitted by:

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5.2.1 Introduction

Climate change is and will be a decisive topic in the 21st century and is constantly discussed in public, but also in politics (Rhodes, 2016). The long-term change in the average climate patterns is felt primarily through a change in water – disruption in weather patterns lead to extreme weather events, unpredictable water availability, contamination of water supplies and the worsening of water scarcity (Unicef, 2021). The IPCC highlights in a 2014 report that the coastal zones and mountain areas will be more intensively affected by climate change than other regions (IPCC, 2014).

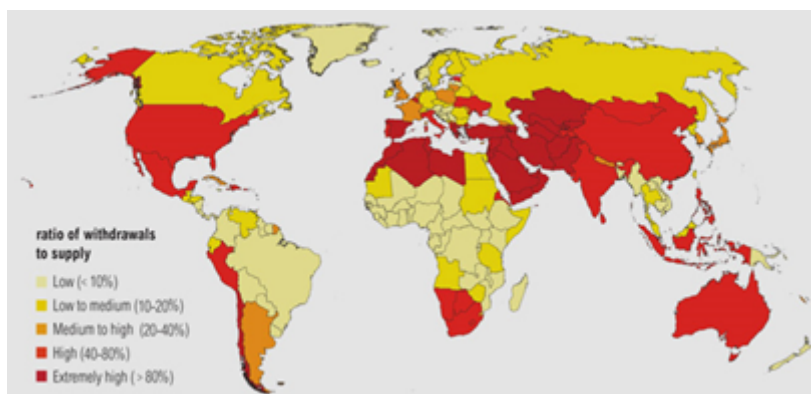


Figure 6: 2040 - Water stress by country
Source: Alt, 2020

Billions of people still lack access to sanitation, hygiene and clean drinking water. By 2025, half of the world's population will live in water-stressed areas. Although water scarcity already affects every continent, the global water demand is anticipated to increase over the next few decades. On the one hand, water use has been increasing at more than twice the rate of population growth during the last century. On the other hand, rapidly growing populations cause a rising consumption by people, companies and farms (Unwater, 2021). "When the well is dry, we know the worth of water" (Benjamin Franklin) – water represents one of the most important and valuable resources that the population often takes for granted (Unicef, 2021).

But where should all the water come from? Waterlution faces the sixth Sustainable Development Goal to ensure availability and sustainable management of water and sanitation for everyone by 2030. A reliable and safe supply of clean water is essential for a life in dignity and health (Bundesregierung, 2021). In this regard, the pilot project starts on Tenerife. The increasing water shortage faces the tourism industry with almost 5 million tourists every year (Statista, 2021). Due to limited physical resources, a geographical isolation, the susceptibility to natural disasters and unique ecosystems, the volcanic island suffers immediate challenges in meeting the population's water needs (Santamarta-Cerezal, Rodriguez-Martin, 2013). In addition, the tap water is undrinkable and 68% of the drinking water in northwestern Tenerife seeps into the ground. Numerous problems require a suitable solution (Teneriffa News, 2021).

The following content illustrates the step-by-step development of the business idea, which is afterward illustrated in its individual components and a critical evaluation of the practicability and value of the emerging business model in the end.

5.2.2 Business Idea Development

The global water usage has increased more than twice the rate of population growth over the last decade. Water is needed in all sectors of society and the ongoing pandemic has underscored the need for universal access to clean drinking water (United Nations, 2021). There is the urgent need for the implementation of an integrated management of water resources. The water shortage on Tenerife constitutes the underlying problem for the development of the business idea.

5.2.2.1 Identification of Personas

To understand the pain of the ones affected by the water shortage, personas were developed. They represent the target group that could benefit from solving the problem. The intention here was to find a segment for which the later product could be designed and to identify and understand who is affected by the water shortage. Since tourism and agriculture represent the largest part of the gross domestic product in Tenerife (Cabildo de Tenerife, 2021), initially these segments were targeted. Furthermore, the inhabitants of the island were selected, as water scarcity affects their lives as well.

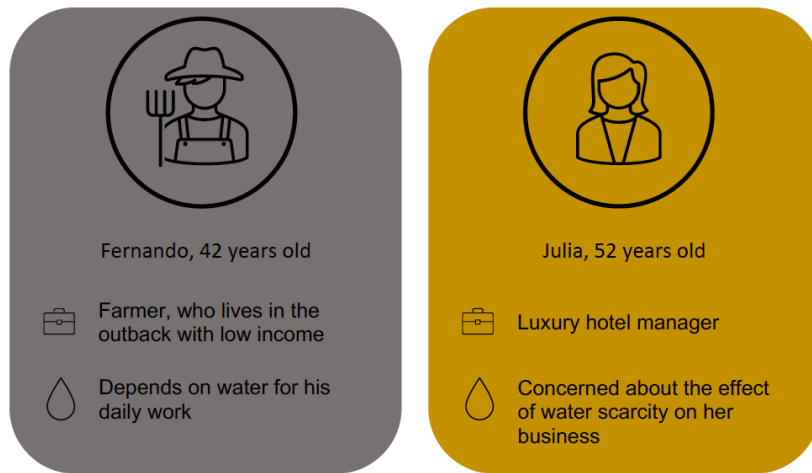


Figure 7: Waterlution – Personas
Source: Own illustration

5.2.2.2 Value Proposition

After the personas were created, the value proposition was explored to get a deeper understanding of the target group including their daily jobs. For this, the difficulties of the jobs were investigated and how an improvement would affect them. The focus here was not on working out a solution but to deeply understand the pains, gains and values of the target group.



Figure 8: Waterlution - Value Proposition
Source: Own illustration

The job of our typical persona - a farmer with family - is the daily work on his farm. He uses a lot of water to grow food and to feed his animals. Therefore, the water shortage has a direct impact on his work life and existence. If there is a lower water supply, he can no longer irrigate all parts of his land and crop failures will occur.

If the price of water increases, his costs will rise and he either has to charge more money for his goods, which has an impact on his competitiveness, or his profit decreases and he has to face financial problems. Without the fear of an uncertain future due to water scarcity, he could continue to survive as a farmer and secure his family financially. Moreover, he would have the opportunity to focus on other aspects of agriculture to improve his farm.

The persona of the segment tourism industry is a luxury hotel manager. She has to deal with the daily business in the hotel and her priority is to make the guests and her staff happy. The tourism industry consumes a lot of water, especially luxury hotels that have an average water demand of 700 liters per day per customer (Cruz-Pérez et al., 2021). Therefore, the water shortage would demand savings in water consumption which complicates the common water supply of the hotel. The hotel could receive fewer visitors and the watering of the green areas would also decrease. If the price of water would increase, the manager would be forced to take actions of raising the prices to secure the financial situation of the hotel. This could have an impact on room bookings. With a sufficient water supply the manager could offer her guests the comfort they expect without having to risk her life's work. In addition, she would be able to secure long-term jobs for her employees.

5.2.2.3 Business Idea Generation and Evaluation

After sufficient research, a brainstorming session was held to come up with ideas to combat the problem of water scarcity. The following figure shows the generated ideas, which were collected and evaluated afterwards.

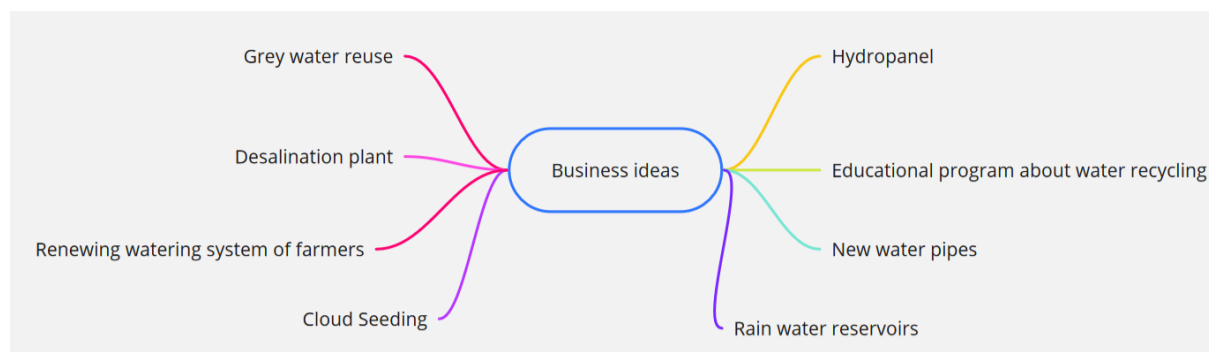


Figure 9: Business Idea Generation
Source: Own illustration

Grey water reuse was mentioned as one of the ideas. Here, slightly polluted wastewater from bathrooms, showers or washing machines is reused. The water can serve as process water. The easiest way to use grey water is to pipe it directly outside and use it to water plants or fruit

trees. However, this idea was rejected because the water harms the fruits when they come into contact with it and the water savings are not enough to improve the problem in the long run. Also a whole new pipe infrastructure has to be built which results in big investments and effort (Greywater Action 2021).

Another idea was the desalination of water. The desalination leads to drinking water and process water by removing the dissolved salt in seawater. This idea was not selected because desalination creates a brine that is discharged back into the ocean, bringing pollutants into the sea (Grellier, J. 2019).

Furthermore, the cloud seeding, used in Dubai was inspiring for the idea generation. It improves a cloud's ability to produce rain or snow by artificially adding condensation nuclei to the atmosphere. For this, airplanes or rockets are used to initiate the rain. The problem of the implementation on Tenerife is that the position of the clouds cannot be influenced, so that it can happen that the clouds rain over the sea and the water brings no added value. It is also debatable if setting up planes and rockets to initiate rain is a sustainable and environmentally friendly solution. The emissions produced will most likely affect the environment and air condition to the worst. Another convincing point that was mentioned was the possible negative effect on tourists' happiness, when they can not enjoy the beach if it constantly rains on the Island (McDonough, F. 2019).

The most convincing idea to the team was the development of a Hydropanel. Being in Tenerife and seeing the foggy mountain side ourselves while driving up the volcano Teide made us think about using nature itself and the natural humidity of the Island to generate clean water. The renewable water technology of a Hydropanel uses the power of the sun to extract clean, pollutant-free drinking water from the air. The collected water is then mineralized to make drinking water a readily available resource (Source, 2021).

With one Hydropanel producing up to 10 liters of fresh drinking water per day you can eliminate the need for 146,000 single-use 500 ml plastic water bottles over its 20-year lifespan.

After generating the product idea, the target group was narrowed down. Initially, it was decided to offer the Hydropanels to hotels, since most of the hotels already have solar panels and have the financial resources available.

5.2.2.4 Interviews

In order to assess the demand of the defined personas for the product and to prove the established hypotheses (see appendix 1), interviews were conducted. We prepared a questionnaire for luxury hotel managers and one for the government as they are responsible for managing the water supply on the island (see appendix 2).

It turned out that the hotel industry in Tenerife causes high water consumption and plastic waste. The questioned manager showed a high level of interest in a sustainable solution for a high-quality water supply. The independence from external water suppliers seemed particularly attractive. Furthermore, the scarcity of water was addressed as a problem to be solved. So far the drinking water used in the hotel comes from water springs of the volcano Teide and is used as drinking water as well as for sanitary and watering plants. A lot of water can be saved by separating the clean drinking water from water for sanitary or gardening.

Unfortunately, we could not directly speak to a governmental representative due to the short stay on the island. Nevertheless we managed to speak to the receptionist and she confirmed to us that there are government subsidies for sustainable solutions to improve water scarcity on the island. The improvement of the water supply on Tenerife is therefore also in the interest of the government and thus facilitates the financial realization.

5.2.3 Business Idea

5.2.3.1 Product description

When visiting the luxury hotel Tigaiga the team realized that nearly every higher-class hotel on the island already has solar panels on their roof. Considering that it would be a big investment to replace all the solar panels for Hydropanels a more sustainable solution had to be found. Instead of building a full Hydropanel, it was decided to design an add-on device that could be installed on the solar panels that are already in place using a combination of solar photovoltaic & solar thermal technology. This will not only save costs but also resources.

This is how it works:

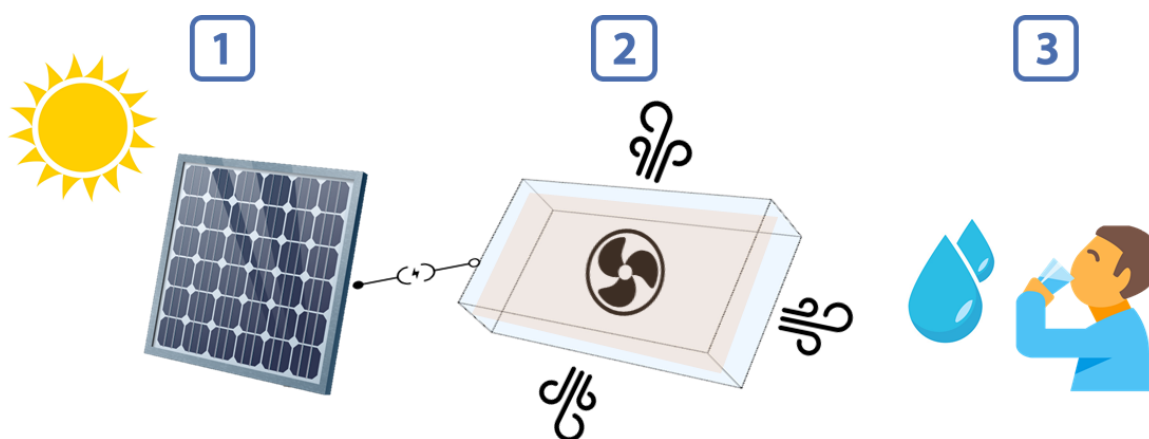


Figure 10: Functionality of the hydropanel
Source: Own illustration

Step 1:

The existing solar panels are powered by the sun and convert sunlight into electricity. A small amount of the generated electricity is used to power the add-on device completely off-grid. Combined, the solar panel and the add-on device built a perfectly working hydropanel.

Step 2:

Fans installed in the add-on draw surrounding air into the device and push it through water absorbing material that traps the water vapor from the air.

Step 3:

Now the trapped water vapor is extracted and condenses into drinkable liquid, that can be either stored in a reservoir or can be led directly into the drinking water system of the hotel or household.

What makes this product unique is the special operator model Waterlution offers. The product can be bought as well as rented for a monthly fee. Waterlution takes care of everything from installation, service and maintenance. This makes it very easy for any customer who wants to invest in a Hydropanel, as our personas showed a high interest in an easy solution.

5.2.3.2 Business Model Canvas

The Business Model Canvas, developed by Alexander Osterwalder, is a strategic management tool that provides a framework for visualizing and structuring business models (Business Models Inc., 2021). It helps to understand a business model in a straightforward way. The model consists of nine elements, which provide a coherent view of the relevant business key drivers. To challenge and visualize our business idea, we applied the Business Model Canvas (Cowan, 2021).

Key stakeholder

Key stakeholders are all internal and external groups of people who are directly or indirectly affected by the company's activities at present or in the future. Every company has a wide variety of stakeholders (Prof. Dr. Jean-Paul Thommen, 2018). In the beginning, we limited ourselves to four stakeholders who were very influential to us. Since our business idea is initially focused on the hotel industry, hotels are naturally important stakeholders for our company. To be able to cover the costs, we are also dependent on subsidies and grants from the government. Since we are a sustainable business model, many environmental organizations, as well as environmentally committed individuals, are naturally interested in our company.

Key Activities

Another part of value creation is the question of key activities. So what do we, as a company, really have to do? Our main task is obviously the generation of drinking water out of the air. To

make this possible, research and development is an important task for us. For the conversion of humidity into water, we need to produce so-called Hydro Panels. A further task is then of course the successful marketing and sale.

Key resources and capabilities

This element describes the inputs we need to carry out in order to create our value proposition. Experts, investors, as well as a production facility are certainly three of them.

Profit, People and Planet

The value proposition perspective combines the elements of Profit, People, and Planet. What sets us apart from our competitors in the market? In contrast to the sale of drinking bottles in supermarkets, we completely dispense with plastic bottles. The water can be filled directly into a drinking glass or other sustainable container. This then leads to a reduction in waste and pollution. Another advantage lies in the independence from others. In addition, the use of our product increases the hotel image. One advantage that is particularly worth highlighting is our unique operating model. This model offers an all around service from installing and maintenance to excellent customer service.

Cost structure

Another element in the business model canvas is the identification of all costs incurred. A large amount of costs will be incurred by our company in R&D and production. Of course, the establishment of a company also costs money and the running costs must also be taken into account.

Revenue streams

To cover the costs it is important to know the revenue streams on the other hand. The government is very interested in our business model. Therefore, we can count on government subsidies. Another main source of income will, of course, be payments from our customers.

Customer Relationship

What type of relationship do we want to have with our customers and how will we interact with them? We decided to start with hotels as customers since tourism is the biggest pillar in Tenerife's economy. They want to provide their guests with access to clean, natural drinking water. So this represents a B2B relationship.

Channels

This part describes how our company will communicate and get in touch with our customers. Channels are basically the touchpoints between the company and the customer (Athuraliya, 2019). For the time being, we have agreed on the following four channels: online shop, Business social media, Hotel fair as well as direct sales via representatives.

Customer segments

The last part to complete the model are the customer segments. As already mentioned, we are focusing on hotels for the time being. In the future, we would also like to be able to acquire public institutions such as schools and universities as well as private households as customers.

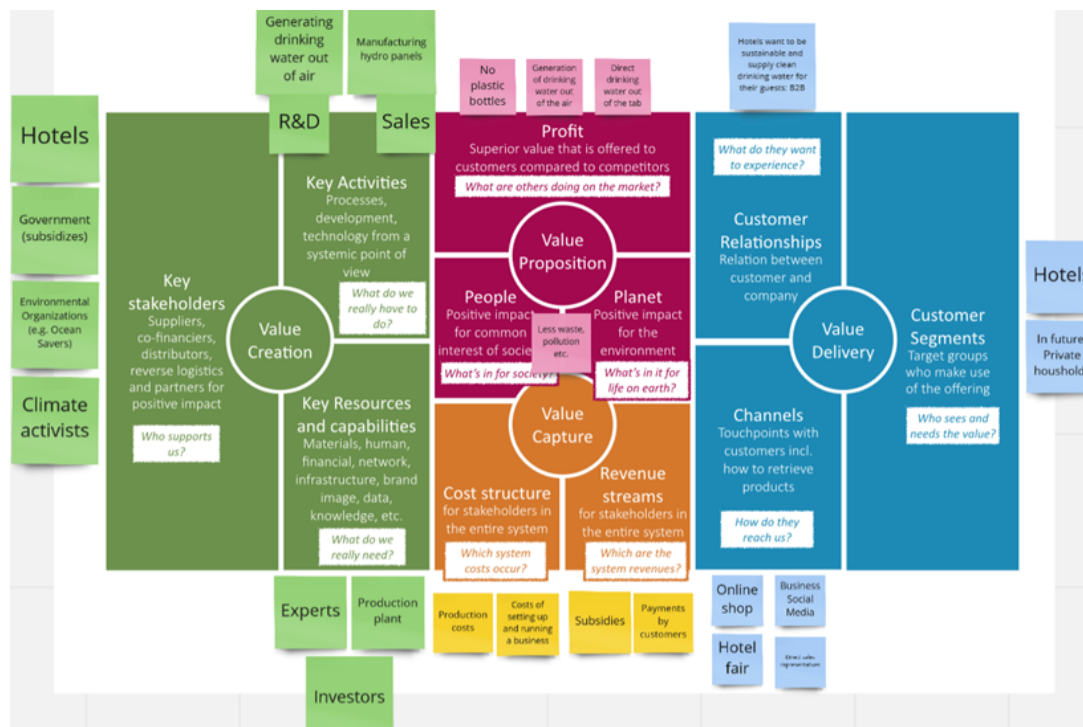


Figure 11: Business Model Canvas
Source: Own illustration

5.2.3.3 Circular Business Model

A Circular Business Model (CBM) describes how a company creates value while minimizing environmental and social costs as much as possible. To secure future viability of business activities and market competitiveness CBMs concentrate on redesigning and restructuring the Product-Service-Systems from bottom up. It aims to ensure that the materials used are as durable as possible and can be used over again (Sustainability Guide, 2018).

Our business model is also based on the circular business approach. The idea is to not only sell a physical product, but to create value using ecological and social factors. With our product, natural resources like sunlight and air are used to generate clean drinking water.

Looking at the water cycle, the moisture of the air is extracted without affecting the environment and is transformed into drinking water. Afterwards the water is consumed by the people living on the island and naturally given back to nature to close the cycle. Plastic water bottles are no longer needed, which will significantly reduce the usage and thereby reduce plastic waste on Tenerife. Hydropanels offer an endless and very sustainable source of drinking water as sunlight, air and humidity will never run out as long as humans exist.

To support the local economy, the aim of Waterlution is to cooperate with local companies and to make use of as many long-lasting and recycling materials as possible in the production process. At the same time, it is planned to mineralize the water with volcanic stones of Mount Teide to make it unique and connected to the region, so chemicals can be dispensed in this step as well.

The Hydropanel is intended as a supplement for existing solar systems, so they can be reused and expanded in their functionality. This also implies that no additional electricity is needed, only a very small fraction of the electricity generated by the solar system is used. The regular maintenance included in the operator model also helps to identify possible flaws at an early stage, which ensures a long-lasting product.

5.2.4 Business Idea Evaluation

5.2.4.1 SWOT Analysis

In order to analyze the concept and take a holistic and long-term view of the business idea, a SWOT analysis was conducted. The SWOT analysis is often used after the formulation of goal and mission to depict the company's internal strength and weaknesses and the external opportunities and threats. Especially in the early stages of development a SWOT analysis is a suitable tool for the strategy creation, which verifies the appropriateness of the objectives (Fatehi & Choi, 2019, p.196).

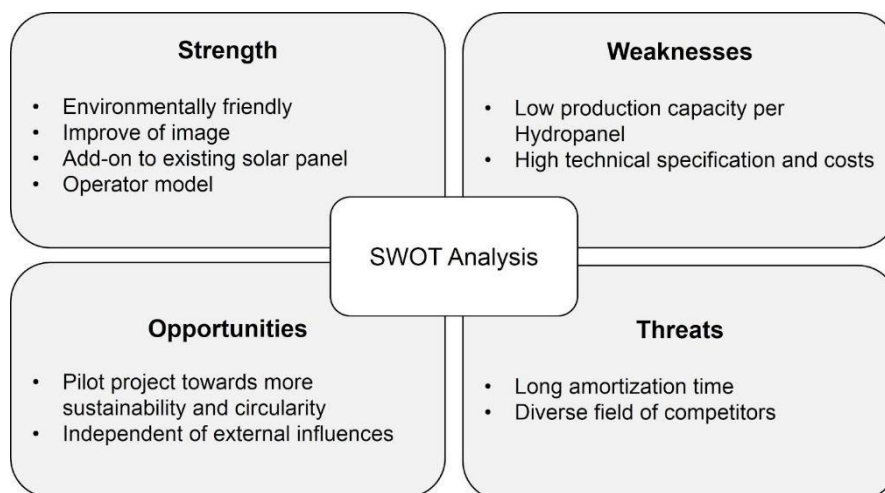


Figure 12: SWOT Analysis
Source: Own illustration

Strength:

The strength and mission of Waterlution is to produce fresh drinking water in an environmentally friendly way. With a Hydropanel drinking water no longer has to be bought, transported and stored in plastic bottles. Thus, the product enables hotels to become more sustainable which can help to obtain sustainability certificates and to improve their image.

Furthermore, the Hydropanel can be simply installed to an already existing solar panel and thanks to the operator model everything from installation to maintenance and repair is conveniently handled with small installments instead of a costly one-time acquisition. Once the panel it can operate independently and create water just out of the air and sun.

Weakness:

The main challenge for the success of the business is the fact that the current development of technology can only produce up to ten liters of water a day per Hydropanel. So, the installation of a Hydropanel cannot fight water scarcity on Tenerife on its own or make a hotel independent of the water system in Tenerife, instead just the drinking water supply for the guests can be covered.

Additionally, the Hydropanel has higher technical specification and causes higher production and acquisition costs than, for example, a rainwater collection system.

Opportunities:

From the external perspective Waterlution is creating a pilot project for the tourism industry, taking into account the current social trend towards more sustainability and circularity. The pioneering position can help to spread the idea on Tenerife to broaden the target group in the future.

The solution of Waterlution is not depending on the old pipe system in Tenerife where in some areas more than 50 % of the water is lost in the network. Instead, it is an offer that is independent from external influences like leaking pipes, water shortages or increasing water prices (Sánchez, 2021).

Threats:

In order to fully realize the opportunities for the future, the Hydropanel needs to get cheaper to successfully compete against water companies also outside the tourism industry. With the current prices for drinking water the amortization time might be too long for smaller clients. In this case buying the water from the supermarket or solutions like a water filter for the tap might be more convenient. Other forms of water extraction, such as desalination plants or rainwater reservoirs also compete with the Hydropanel and therefore pose a danger

Additionally, possible plans to renew the water pipes in Tenerife and create drinkable tap water would compete with the Hydropanels.

5.2.4.2 Challenges

Waterlution offers an add-on device for already existing solar panels, that gives anyone who installed it the opportunity to generate clean drinking water out of the air. As already presented in the swot analysis, there are dangers and challenges for the business idea of Waterlution, which will be examined again in more detail below.

However, the production and installation of this advanced technology does not come cheap. Even though existing solar panels can be used, there still are high investments to be made for the installation and service. Not every hotel or even private person will be able to make that kind of investment. The drinking water from hydro panels may be the most sustainable source of water as it is an endless one, but it is not the cheapest. Customers have to put saving the environment before their financial benefit within the first couple of years of installation. Only financially stable hotels with a big focus on sustainability and the environment are willing to do this for their customers and it will be hard to change the mindset of people.

Another big challenge is the amount of water that can be generated out of a single panel. So far the average amount counts 8-10 liters a day per hydro panel. This depends on environmental factors like the humidity and the amount of sunlight that day. The generated drinking water will not be enough to meet the demand of drinking water for every hotel guest or household. Hotels will still be dependent on external water supply for showers, toilets, watering the plants and even drinking water. This results in focusing on improving the capacity of harvesting drinking water from the air. If enough fresh water can be generated from our Hydropanels to meet the water demand of the hotel or household, Waterlution can revolutionize the water industry.

5.2.5 Conclusion and critical reflection

With the advanced technology of hydropanels, Waterlution addresses the problem of water scarcity on the island Tenerife in order to reach the Sustainable Development Goal "Clean water and sanitation". The goal is to ensure availability and sustainable management of clean drinking water for everyone on the island.

During the time on Tenerife and the workshops in the bootcamp the team was able to gain a better understanding of the situation on the island. While speaking to locals and hotel employees in the industry, we could develop our business idea further and adapt it more to the needs of the target group by for example offering an operator model.

The luxury tourism industry especially can benefit from this new source of fresh drinking water as tourists in this segment use an average of 700 liters per guest per night (Cruz-Pérez, 2021). For Waterlution to make a big impact on the island's water supply and for the successful implementation of Hydropanels across Tenerife further research is needed. Due to the fact that

implementing sustainable Hydropanels requires higher efforts and money compared to other water sources, Waterlutions business model bears the risk of not being accepted by the customers. The team needs to conduct more interviews with the defined persona to understand the pain and needs deeper and carry out a detailed benchmark. Despite this, the mindset of people all over the world towards more environmentally friendly travel is rising and Waterlution sees a high potential for the willingness to invest in Hydropanels.

Furthermore, there needs to be a team of specialists taken on to deepen the knowledge about the used technology and improve the capacity of generated water. Since the government of Tenerife has big funds to support sustainable business ideas to fight water scarcity, it is mandatory for Waterlution to cooperate with institutions like Cabildo de Tenerife. With further research and financial aid from the government, Waterlution can expand its customer group to schools, universities, cultural institutions and also private households. The main goal and vision is to equip every household in Tenerife with Hydropanels so that every resident and tourist living or visiting the island can benefit from sustainable clean drinking water from their roof. This would be a big step towards a more sustainable future without the worries of water scarcity.

After the successful establishment of Hydropanels in Tenerife, the technology can easily be adapted to the other Canary Islands as well as countries all over the world. Tenerife is seen as the perfect test market with perfect weather conditions across the island.

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5.2.7 Appendix

Appendix 1: Strategyzer Test Cards

Test Card		Strategyzer	
Test Name	subvention	Deadline	09.11.21
Assigned to	government	Duration	
STEP 1: HYPOTHESIS			
We believe that		the government will subsidize part of the costs for clean water generations.	
		Critical:   	
STEP 2: TEST			
To verify that, we will		talk to the responsible people in town hall in Santa Cruz.	
		Test Cost:    Data Reliability:   	
STEP 3: METRIC			
And measure		the available funds for sustainable solutions.	
		Time Required:   	
STEP 4: CRITERIA			
We are right if		at least one person agrees that there is funds available.	
Copyright Strategyzer AG The makers of Business Model Generation and Strategyzer			

Test Card		Strategyzer	
Test Name	Water need	Deadline	09.11.21
Assigned to	hotel industry	Duration	
STEP 1: HYPOTHESIS			
We believe that		clean drinking water is essential for the hotel business and hotel managers are looking for a sustainable solution other than traditional water sources.	
		Critical:   	
STEP 2: TEST			
To verify that, we will		ask three luxury hotel managers in Tenerife.	
		Test Cost:    Data Reliability:   	
STEP 3: METRIC			
And measure		the need for clean drinking water for the guests.	
		Time Required:   	
STEP 4: CRITERIA			
We are right if		2 out of 3 managers agree, that they are looking for sustainable water sources.	
Copyright Strategyzer AG The makers of Business Model Generation and Strategyzer			

Source: Own illustration based on Strategyzer (n.d.)

Appendix 2: Interview with hotel manager

Interview with Mrs. Pérez, hotel manager in Tenerife

Date: 09 November 2021

Time: 6:25 pm

Good evening Mrs. Pérez. Thank you for agreeing to answer some questions for our research paper. First, we would like to know, where you buy the drinking water you need for the guests from.

You are welcome, I am always happy to help. We get our drinking water from external suppliers. Most of it comes from freshwater reservoirs. It either gets delivered in big plastic bottles or comes directly through pipes that are connected to the water system.

Would you say that you have a high demand of water in your hotel?

Yes, considering that we offer a certain standard to our guests we have a high water consumption and a lot of plastic waste. Our customers do not want to worry about them kind

of things when on holiday. Most of our customers shower at least once a day, sometimes more than that. Some of them are here for business meetings, some for holiday but they all have in common that they want to enjoy the luxury we offer. We have a big garden as well that needs a lot of watering. We do not have many days where it rains, so we are dependent on external water suppliers.

Do you think water shortage will be a problem for you in the future?

I don't know. I think it could become a severe problem. Right now, we are not facing any water shortage in this hotel specifically, but I heard that the water capacity of the reservoirs is going down. Like I said, we do not get a lot of rain in this area so if we run out of water it would be a big problem for us. The water prices also increased over the last years what makes me worry a bit. Corona has impacted us a lot, we did not have many tourists but still had to keep everything maintained. If the summers become hotter as well then, we need more water, and it will become a problem.

Would you be interested in a sustainable solution that gives you the possibility to generate your own drinking water?

Yes of course! We would love to have a sustainable solution for drinking water. It would be great to be independent from external suppliers. Of course, it would have to be affordable as well. Especially because of the impacts and challenges of the pandemic we do not have a lot of money we can use to invest. But we are always looking for ways to improve our environmental impact and find more sustainable solutions.

Are your guests interested in environmentally friendly solutions?

Yes, I would say so. We are already doing our best to be very sustainable. We have solar panels on the roof and our own compost for food scraps from the kitchen. We recycle our oil, and we use nature to help us save energy. We also give our guests the opportunity to be involved in saving the environment by giving them the choice to not change the sheets and towels every day. Even though our customers are mainly older people they do use this a lot.

Thank you so much for answering our questions. You helped us a lot.

You are welcome, good luck with your project.

5.3 From Coffee to Cups

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5.3.1 Current Situation and Problem

Tenerife is the largest of the Canary islands. They are situated in the Atlantic ocean west of the Western Sahara and belong politically to Spain and, by that, to the European Union. The island is about 2040 square kilometers in size, on which there are approximately 900.000 inhabitants (Spain-Tenerife 2021). The islands form a strategically important location as they connect the three continents North America, Europe and Africa despite their remote location.

The island's economy is mainly focused on the tertiary sector with over 74,6 percent of people working in it. Further 10 percent are made up by the primary sector. Agriculture is also very important on the island as potatoes, tomatoes and especially bananas are cultivated. In the last years popular crops like the avocado had been added to the cultivation on the island. The great majority of these products are exported. In doing so Tenerife can make use of being part of the European Union and sell within the customs and currency union (Cabildo de Tenerife 2021).

However, as the Covid pandemic hit all parts of the world hard, tourism went down on the Canaries due to several lockdowns and travel restrictions or bans. The very popular vacation destination with over 1.5 million visitors on average per month had to face a sudden drop in the number of tourists, which are their most important source of income. Between March and December 2020 the islands only received around 2 million visitors the whole year. The economy is still recovering from it and the number of tourists is now slowly rising again (Instituto canario de Estadística 2021). However, this absence of tourists revealed another problem associated with tourism.

Not only did the number of visitors drop, but also the amount of waste plummeted. By that, it became even more obvious how much waste is related to tourism and how big the problem is which Tenerife constantly has to face. An extensive study of Spanish scientists focused on tourism revealed that each additional tourist produces 2.97 kg of waste per day, which is 1.32

kg higher in comparison to the average waste production of a Tenerifean municipality. (Asociación Española de Expertos Científicos en Turismo n. d.).

For these several reasons, we decided to dedicate our business idea to sustainability goal number 12 “Responsible Consumption and Production”. We wanted to find a solution to the waste problem of the island without having to cut back on tourists received, as they are the primary source of income for the islanders. With our final business idea we not only achieve reusing former waste, but at the same time can even stop the use of plastic cups at pools which are produced with natural oil.

5.3.2 Business Idea Development

After we had agreed on a sustainability goal (responsible consumption and production) in the group, we started to think about a business model. We had the opportunity to discuss this in a Zoom meeting. Each team member contributed different ideas - guided by brainstorming - which were then discussed and evaluated by the other team members. Within a short time, a rough idea had already developed: To open a café or restaurant that, on the one hand, restores discarded furniture from hotels, for example, and, on the other hand, offers educational and interactive workshops for locals and tourists in connection with it. Because the goal we wanted to focus on is upcycling and recycling of waste.

In the next step, we created a persona with which we wanted to represent what exactly the problem is and to what extent this person is affected by it.

We had a person in mind who sees the problem in the fact that especially tourists leave a lot of waste on the island. This affects insofar that the person is very close to the island and nature. Furthermore, our person is disturbed by the extent of waste generation, for example in hotels.

However, during our time in Tenerife, we noticed that surprisingly little waste is found in public and it is therefore relatively clean. Consequently, it would make little sense to try to change the behavior or awareness of tourists regarding waste (via workshops), if the problem does not exist to the extent imagined. Therefore we decided to discard the first business idea and to think about something new.

Next, we thought about where exactly what waste is generated and also asked some local hotels about it. We came to the conclusion that, on the one hand, coffee consumption on Tenerife is enormously high, which leads to a high proportion of coffee grounds as a waste product. On the other hand, we visited a banana plantation, where we noticed that the old leaves are left there and are not reused or disposed of. A third interesting observation was made during a visit to a hotel, when the owner explained that, as a legal requirement, glass or porcelain drinking vessels cannot be used in the pool area because of the high risk of injury,

and therefore paper or plastic cups are used there. This is because glass or porcelain is not only easily breakable if dropped, but disposal also reduces the hotels' sustainability rating. The main problem is rather the waste that is produced in restaurants or hotels - both by tourists and locals. It would therefore make much more sense to think about the recycling of existing waste.

Through all the observations and insights we gathered, we thought about whether a new, sustainable product could be made from this waste. Ideally from materials that could be sourced directly from the island. This is how we came up with our final idea of a sustainable coffee cup made from biopolymers, plant waste (e.g. banana leaves) and coffee grounds.

5.3.3 Business Concept

For further explanation of the start-up, the business concept is presented in detail in the following sections.

5.3.3.1 Frame Conditions

From Coffee to Cups is an emerging start-up based in Santa Cruz de Tenerife, dedicated to the production and distribution of sustainable cups made from coffee grounds and plant waste collected locally on the Canary Island of Tenerife.

Considering current and formative megatrends such as global warming, society's growing awareness of environmental issues and the wear-and-tear mentality of goods, From Coffee to Cups persecutes the higher goal of making its contribution to ensuring the sustainable survival and well-being of all creatures on this planet and the environment. In doing so, values such as sustainability, resource conservation, up- and recycling form central elements of the young company's vision and set the corporation's guiding principles for the long term.

The main core of the company is represented by a top management consisting of the Managing Director and the two heads of finance and production. The corporation operates as a so-called "Sociedad de Responsabilidad Limitada" (S.L.), which corresponds in its general conditions to the German corporate form "Gesellschaft mit beschränkter Haftung" (GmbH). Unlike in Germany, the share capital required for formation amounts to 3,006 Euros (Martínez-Rodríguez 2016). The capital contribution needed for the incorporation of From Coffee to Cups is made by two shareholders. Furthermore, those shareholders' task is to meticulously control the top management and to monitor their actions to make sure main guiding principles are maintained. As consented in the company agreement, shareholders resign their corresponding profit distribution in the first two years to not hinder the initial prosper phase of the young corporation. For compensation, the net profit will be paid out at a rate of 55% from the third year onwards.

One unique selling proposition that definitely has to be considered is the exclusive composition of the products and the local production on the island of Tenerife. As already mentioned, cups are made from a combination of old coffee grounds, plant waste and biopolymers. While the provision of coffee grounds is guaranteed by the high rate of coffee consumed in local hotels, plant waste can be collected from the island's banana plantations and can finally be intermixed with the biopolymers in laboratories. Benefitting from this special formation, the company has not only succeeded in reintroducing components that would be thrown away back into the life cycle but has also created a product which is not only sustainable but also durable and reusable. On top of that, it is worth mentioning that From Coffee to Cups offers the possibility of personalizing the mugs according to personal preferences. In this way, a revolutionary product is born.

At the beginning of its success story, the company focuses on selling sustainable cups to local hotels. Since hotels are obliged by law to use unbreakable plastic dishes around the pool area to lower the risk of injury, the wear and tear of plastic in the tourism sector on the island is extremely high (WWF Germany 2019). In addition, for luxury hotel chains such as Iberostar, plastic ware is an inelegant and environmentally unfriendly option for serving food and drinks to its guests in the spa area. Regarding the tourism sector, the price per cup amounts to 6,99€ and is based on comparable suppliers, whereby it must be taken into account that hotels benefit in many ways by using From Coffee to Cups' exclusive alternative: Firstly, the high risk of injury at pools is counteracted and therefore, the fulfillment of the law is granted. Secondly, hotels get the unique opportunity to accommodate their customers with elegant, customizable, and durable tableware. Finally, it should be mentioned that by using From Coffee to Cups products, the sustainable marketing strategy of hotels will improve significantly.

In the further development of the company, From Coffee to Cups products will be available not only for local hotels but for everyone. Via online channels, private households, and retailers, such as cafés or shops get the opportunity to acquire chic, durable and reusable cups. In purchasing and using those, our clients become one with our visions and values: sustainability, social impact, and respect to nature.

Moreover, the distribution of products to local cafes and stores expands the brand awareness and therefore provides the security for the increasing demand. Furthermore, the online sales channel not only serves to sell the products but also directly answers any questions customers may have in a Q&A sector. From pricing information and quantity scales to a detailed description of the customization process, everything is explained in detail on the official website. Obviously, the sales price will be oriented to the ordered quantity. From a purchase quantity of 20 cups, a discount of 10% is granted. In addition to the company's guiding vision of contributing to the sustainable improvement of the Earth's situation, it is of great importance

for From Coffee to Cups to always operate transparently. This is the reason why detailed insights are also provided on the acquisition of the raw materials on the island and the exact manufacturing process of the products.

Another milestone of the company's success is the possibility to produce not only cups from sustainable materials, but also to flexibly switch the production process to any form of tableware. In other words, in the future any type of plates or bowls can be included in the product portfolio. Consequently, a wide range of customer requirements will be covered.

5.3.3.2 Sustainable Business Model

To develop our business idea further it has been decided to implement the sustainable business model. The decision fell on this business model since it goes one step further in terms of circular economy than the business model canvas by focusing on the value. The model the analysis is based on was adapted by Bocken and her colleagues from the Business Model Generation by Osterwalder and Peigneur (Bocken 2020).

A business model is supposed to explain how a company conducts business and how it offers value. The sustainable model widens its consideration to society and environment as stakeholders, instead of only customers. The focus of the sustainable business model is on value creation, value proposition, value capture and value delivery (Bocken 2020).

Appendix 1 shows the sustainable business model of "From Coffee to Cups".

The value proposition consists of profit, people and planet. The profit, which is the higher value compared to others, stems from offering a hardly breakable, local and sustainable cup, while our competitors use breakable porcelain with no sustainable background. From Coffee to Cups positive people and planet impact can be summarized as the reuse of unavoidable leftovers and therefore less waste.

The value capture is divided into the cost structure and the revenue streams. Costs that were identified are marketing to advertise our product, development, collection of the base product coffee grounds and the production. Opposed to this are the revenue streams generated through the sale of the product and the personalization of the product.

The value creation gives an insight into the key stakeholders, key activities and key resources and capabilities. The stakeholders are the people supporting the company which in this case are the local cafés, hotels and possibly in the future households. From those sources the base product can be procured, the coffee grounds. In addition, From Coffee to Cups also seeks collaborations with local banana plants to collect plant fibers. There are also key activities that must be done in the near future. The company will have to develop the product therefore they need knowledge of the chemical composition possibilities. They need to test the product to

ensure it fulfills the expectations. To get in contact with local businesses is also an important step to ensure the supply chain. Lastly, From coffee to Cups must develop a successful marketing strategy for our product. The company intends to work together with their customers. People using the products could give out information about the product to people interested. The key resources and capabilities are coffee grounds, chemical components, development scientists and marketing. From Coffee to Cups needs those to create and market our sustainable product.

The last point is the value delivery. It consists of customer relationships, channels and customer segments. The customer relationships refer to the relationship between customer and company and what the business wants them to experience. From Coffee to Cups intends to create sustainable, long lasting and reusable products. The company works with the assumption that hotels and cafés want to be noticed as being sustainable, which they can support by using From Coffee to Cups products. The business also wants to offer a first-hand experience of our production by offering to visit our company to get an insight into the work behind the product and to interact in person. The channels to get in contact are mainly the hotels and cafés we work together with. Moreover, could it be imagined to set up some stores. From Coffee to Cups also wants to create an online presence. As already mentioned, is it also their intention to offer insights at the production site. The customer segments are the target groups the company wants to focus on. Those are hotels and cafés who want to be seen as sustainable and their customers. From Coffee to Cups also wants to focus on tourists interested in personalized souvenirs. In general, it can be said that the main target group are people who want sustainable products (Bocken 2020).

5.3.3.3 Strategyzer (Interviews)

To strengthen our business idea and user experience, the next step was to focus on who we are exactly targeting with our product. We already generated a target group and a user persona to be clear about the people we want to focus on beforehand. The task now was a qualitative approach, where we observed specific people in direct interviews to get more insight and information. Like this, a difference between what the customer thinks and actually does, for example if they would really pay money for the product, should also become visible (Downs 2020).

This is part of a lean start-up process (Ries n.d.). First, we build our minimum viable product (MVP) to start the process. This product should solve all targeted problems of the customers. The next step was to measure how the potential customers respond to the product and also find some early adapters. After that we focused on learning from the gained insights and checked if we have to adjust our strategy or product in any way. Ideally this process should be

repeated, to keep track of the customer needs and check if the product and strategy still fits or if it can be adapted.

Before getting in touch with the customers, we defined three hypotheses about the customer pains. For structure and the ability to measure the results and derive next steps or adjustments, we used the test cards by Strategyzer. Each hypothesis was written on one card and we filled out each step (Appendix 2).

With the finished cards it was now time to locate fitting interview partners in the area. We decided on visiting two hotels in Santa Cruz de Tenerife: the hotel Taburiente and the hotel Iberostar. At the hotel Taburiente we could only talk to the receptionist because nobody from the management or the kitchen was available at the moment. We still asked her our questions, but she couldn't name us any facts or numbers. Nevertheless, she was quite interested in our idea and had never heard about a plastic alternative made from food waste.

At the next potential partner, hotel Iberostar, we were quite lucky and could even talk to the manager herself. We asked her about our assumptions and found out that the Iberostar hotel has a great amount of coffee drinkers, especially for breakfast, but also during the day. This consequently produces a lot of waste. Our assumption about the huge amounts of coffee waste was verified through this information.

As expected in a hotel, a lot of tableware breaks during the week. Unfortunately, the manager couldn't name us an exact number of broken tableware in a week. The only area in the hotel where no plates or cups could break, due to the use of plastic, is around the pools. There is even a regulation for this use of plastic, due to safety reasons. Our cups could be the perfect alternative to avoid single use plastic. What we didn't consider was that in a five-star hotel like this, plastic might not be the most attractive material. But since the use of plastic around the pool is mandatory anyway, an alternative that could be designed to the hotel's liking could be an advantage.

Our last question was, if hotels want to or must present themselves as more and more sustainable and environmentally-conscious, due to a changing market or even to fulfill their own goals. The main goal of Iberostar is sustainability. The importance and the implications of alternatives are growing constantly. Iberostar mainly has reusable products such as big ketchup or yogurt containers or refillable shampoo bottles. The only single-use products are the coffee capsules in the rooms. These could be potentially collected and brought to From Coffee to Cups as well in order to be recycled. They also use platforms like Earth-Check to compare their own data with other hotels. Our assumption about the desire to be more environmentally friendly in hotels is consequently true. Iberostar would definitely be a matching customer or even partner for our start up company.

In total, all of our assumptions about the customer pains were true. To use the full potential of these customer interviews, a few hypotheses where we are proven wrong would have been beneficial. Through getting feedback and new insights, the MVP can be tweaked and improved. We still learned a lot and gained some new understanding.

5.3.3.4 Circular Business Model Approach

One focus of the project was on the circular economy approach. Circular economy is a consumption as well as production approach. It focuses on extending the life cycle of products by reusing, repairing, refurbishing, recycling and sharing. This can lead to a reduction of waste to a minimum (European Parliament 2021).

Based on the model of Marwede and his colleagues of the learning factory lifecycle design canvas the focus is on re- and upcycling of waste. The individual steps of this circle are collection take-back, disassembly, recycling materials and upcycling (Fraunhofer IZM 2018).

With regard to the business idea, there are two different life cycles where the intention is to intervene with our product (Appendix 3).

The first life cycle refers to the basic product, the coffee cup and how the cup is composed.

The idea is to fulfill the first step of collection by getting the main component, coffee grounds, from the business partners (e.g. hotels, restaurants). The second component of the product, the plant fibres, can be procured through Banana leaves or other plant residues supplied by local companies. The disassembly step is not necessary in this case because the coffee grounds are used the way they are and do not need to be disassembled further. However, other materials needed for the coffee cups, such as banana leaves, would probably still need to be broken down into smaller pieces. In the "recycling materials" step, the individual raw materials are prepared for further processing and the final production. Finally, in the upcycling step, the recycled materials are brought together to create the final product.

The second life cycle refers to the already finished cup and how it can be used further.

If owners no longer want their coffee cup or it has broken, it can be returned so that it can be reused directly, this is the take-back procedure. In the disassembly step the cup is then broken down into its individual parts again. This makes it possible, in the recycling materials step, to reintegrate the disassembled cup into the material life cycle for the production of a new cup. Following, the other materials (processed banana leaves, coffee grounds and biopolymers) must be added again during the composition process to upcycle the reintroduced materials to a new cup in combination of all the materials.

So the company tries to reuse all materials for as long as possible and incorporate them into a long life cycle.

5.3.4 SWOT-Analysis

According to Houben et al. (1999), every company is faced with various internal and external forces that might compromise potential stimulants as well as limitations when it comes to the company performance or its goals. Especially when starting a new business, it is essential to critically scrutinize the start-up's capabilities and derive effective measures for further growth. Therefore, the SWOT analysis offers an ideal tool for young companies to reflect and consciously position themselves.

The SWOT analysis is an instrument commonly used in strategic planning which looks at future possibilities for the organization through a systematic approach into both positive and negative concerns (Balamuralikrishna & Dugger 1995). The letters of SWOT stand for Strengths, Weaknesses, Opportunities and Threats. Whereas Strengths and Weaknesses are represented by internal factors, which are controllable and changeable, Opportunities and Threats are seen as external, uncontrollable factors, which form the external environment within which the organization operates (Chermack & Kasshanna 2007).

Considering the strengths of From Coffee to Cups, the unique material composition needs to be highlighted. Creating a new product from biological waste that is not only versatile in various sectors but also thoroughly convincing due to its exclusive features which are sustainable, reusable, and durable can be seen as the companies' greatest competitive advantage. Moreover, the procurement of the required raw materials for manufacturing is ensured by the ideal local conditions of the island such as the high coffee consumption in hotels and the numerous banana plantations on Tenerife. In addition, these resources are very cheap to acquire since they are basically ecological waste. Therefore, complications in the procurement of raw materials are very unlikely and production costs are rather low.

Regarding the material composition, it is also worth mentioning that the production takes place without any use of mineral oil. To stick to the overall vision of sustainability, From Coffee to Cups is committed to produce without any substances that may harm the environment and all living beings on earth. In doing so, further climate change is counteracted, animals and plants get protected from further destruction and nature gets the respect and recognition it deserves.

Another aspect that must be taken into account when analyzing the company's strength is the fact that all the production takes place directly on the island without any dependencies on third parties. True to the motto "From Tenerife to Tenerife", the whole value creation process belongs to the island and therefore, locals also will benefit, for instance, through job creation.

On the other hand, having a look at its weaknesses, which are described in the literature as those elements that prevent the organization from achieving its Competitive Advantage (Thompson 1993), it is notable that the geographical location and the dependency on the local production on the island can be an obstacle for further expansion in other countries. Although the number of potential customers on Tenerife is very pronounced through local hotels, cafes and private households, the potential market is limited due to the geographical conditions. Even though the products can be shipped easily to other parts of the world for an additional charge, the charm, and the motto of the company "From Tenerife to Tenerife" would lose its credibility.

Looking at the opportunities of From Coffee to Cups, the possibility to really make an impact on the way that people consume plastic stands out. By noticing our cups in a nearby café or in a hotel, not only the brand but also the intentions and benefits are spreading which makes them rethink. People could become more aware of the areas where single-use plastic is still used and through this, they may want to get more information on the topic or want to get this kind of alternative for themselves. This opportunity could become even more beneficial, when tourists pick up on the movement and spread the word in their own country. The awareness could not only be influenced on the island but also in different countries. The unique biological plastic also brings new opportunities because it can be made into several different shapes and designs. This supports the chance to reach different business areas and industries. The possibilities are practically limitless and different types of items can be launched. Almost every area, where single-use hard plastic comes in handy, could be taken over by the offered alternatives. This could include selling cutlery and trays used in planes or even kids beach toys or merchandise made from plastic.

On the contrary, there are also some threads that can occur. It's possible that through the lasting pandemic some hotels still have a decline in hotel guests. Through the lack of income, there is of course not much budget left to invest into new furnishing or equipment. Some hotels or other companies may hold back investing into new objects and throwing the existing ones away. For them, this means changing to new business partners and also spending more money for our products. Hotels may have different priorities right now. Since threads are external factors that the company itself can't control, it's also not excluded that the bio-plastic alternatives of From Coffee to Cups are still thrown away after using them once. Some people maybe don't want to bring the used cups back to the café or bar and prefer to just casually throw them away like they are used to. It is also imaginable that hotels don't want to wash an extra or even double amount of dishes, since they are not used to this amount of reusable items. Either it is too expensive, hard to implement, or the hotels don't really care about the environmental impact and just want the promotion through using the cup alternatives.

5.3.5 Conclusion and Outlook

In general, we learned a lot from the whole bootcamp. We developed a first idea in Germany without knowing a lot about the actual customers and the environment in which we would be developing our product or service. However, when visiting the island we realized that there was no need for our educational workshops. The people were well aware of the waste problem and already knew a lot about recycling and the like. We found stickers explaining topics, like the recycling circle, on every waste bin on the streets. Therefore, as explained, it became obvious that we needed to change our whole business idea and eventually came up with “From COFFEE to CUPS”. This rethinking process made us well aware of how important it is to always check your business idea against the market and the customers. The feedback loops are not only theory, but can and have to be applied when creating successful businesses.

By making cups from locally sourced biological polymers which are mixed with the fibers of the banana residues and the coffee grounds we will be able to provide a solution to the waste problem of Tenerife. Keeping in mind that the most important source of income on the island is tourism, we offer a solution that is in line with the needs of the Tenerifeans. We were able to experience the difficulties start-ups face ourselves and could pitch our idea successfully to the “investors” of the Lions’ Den.

During this last session, one investor came up with another great piece of input. We could try and sell the cups and later the plates to the aviation industry. Using normal china tableware on aircrafts results in high kerosene consumption. Therefore, light-weight plastic plates and cups are used. However, these are not environmentally friendly sourced and mineral oils are used in production. Therefore, our next step would be to provide a sustainable and still light-weight alternative to them. We could start by convincing the airlines operating on the two airports on Tenerife to use our products. Then it would also be possible to sell them directly in the airports for travelers and for tourists as a souvenir. As tourists produce waste all over the world and also drink coffee in most of the places, the product can be produced worldwide. With our business idea the sustainability goal number 12 “Responsible Consumption and Production” can be tackled all around the globe. Former waste gets a second life through recycling and the usage of mineral oil will be reduced as well.

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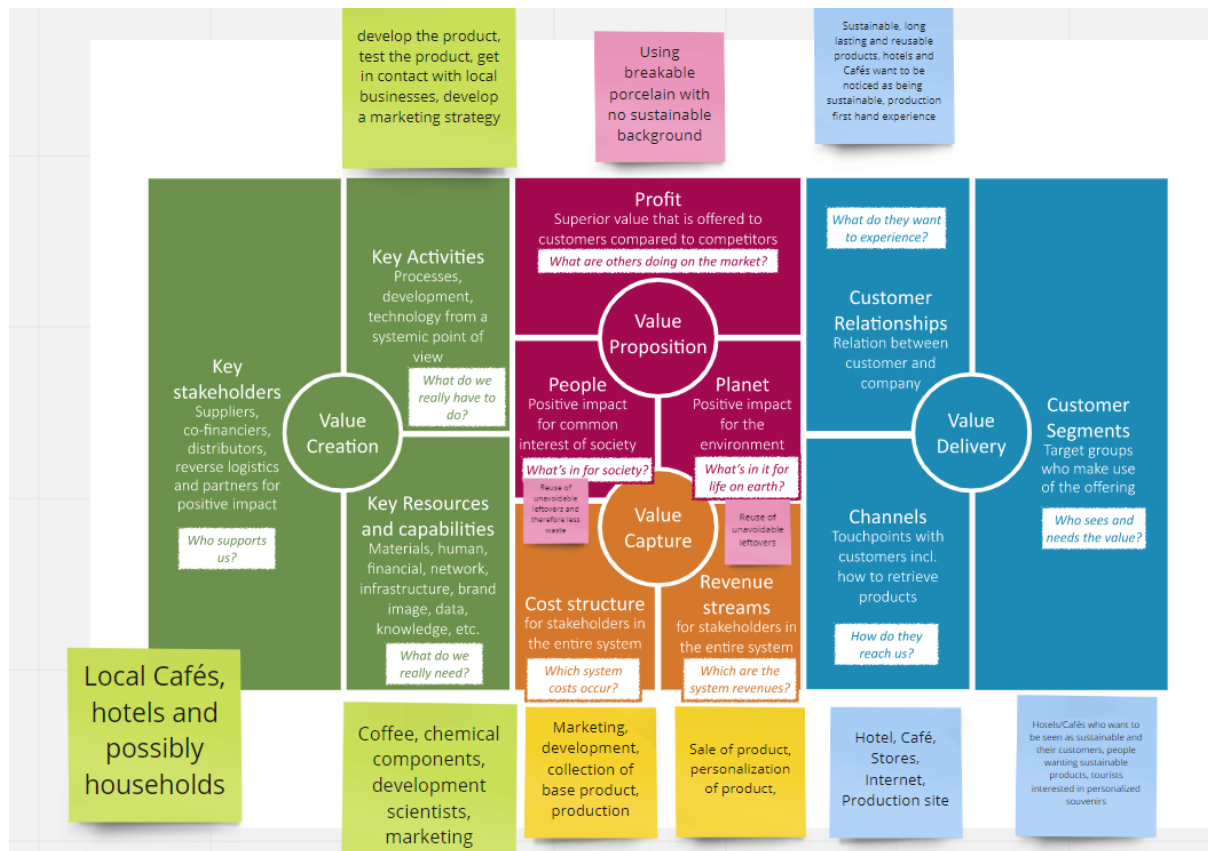
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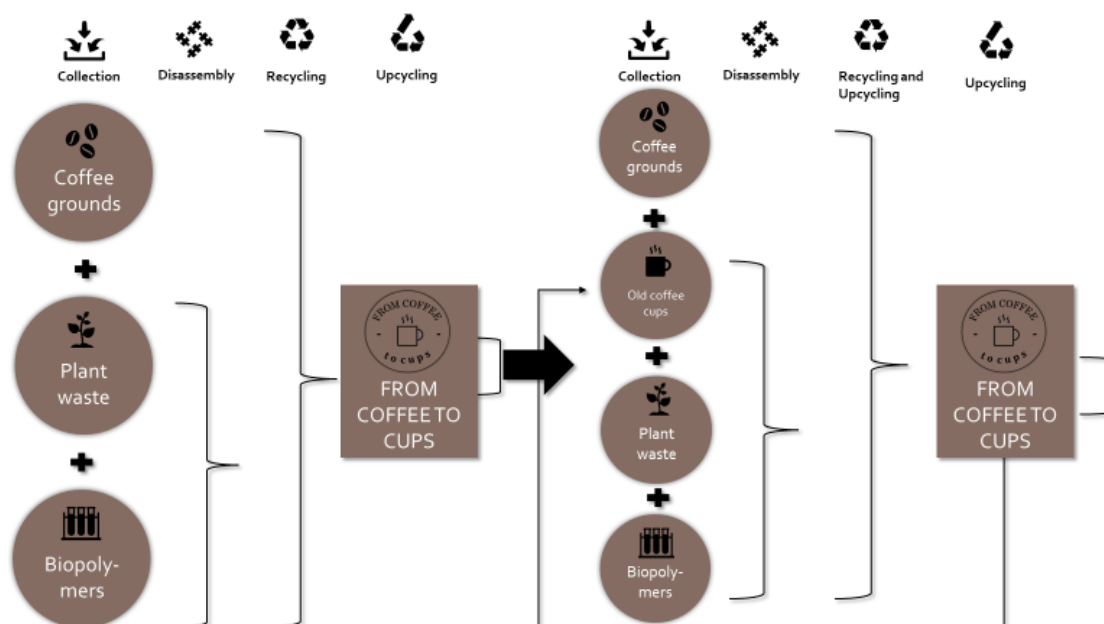
5.3.7 Appendix

Appendix 1: Sustainable Business Model



Source: Own illustration based on Bocken (2020)

Appendix 2: Life Cycle



Source: Own illustration

Appendix 3: Strategyzer Test Cards by “From Coffee to Cups”

Test Card

Strategyzer

Test Name

from COFFEE to CUPS

Deadline

Assigned to

Duration

STEP 1: HYPOTHESIS

We believe that

Tourists consume a lot of coffee for which a lot of coffee waste is produced.

Critical:

▲ ▲ ▲

STEP 2: TEST

To verify that, we will

ask different local hotels.

Test Cost:

Data Reliability:

STEP 3: METRIC

And measure

coffee waste of hotels per day.

Time Required:

STEP 4: CRITERIA

We are right if

one of three hotels states that they waste more than one kilos of coffee per day.

Copyright Strategyzer AG

The masters of Business Model Generation and Strategyzer

Test Card

Strategyzer

Test Name

from COFFEE to CUPS

Deadline

Assigned to

Duration

STEP 1: HYPOTHESIS

We believe that

plates & cups can break easily while being used and need to be replaced very often.

Critical:

▲ ▲ ▲

STEP 2: TEST

To verify that, we will

ask different local hotels.

Test Cost:

Data Reliability:

STEP 3: METRIC

And measure

how many plates & cups need to be replaced regularly.

Time Required:

STEP 4: CRITERIA

We are right if

one of three hotels states that they need to replace five plates or cups a week.

Copyright Strategyzer AG

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Test Card

Strategyzer

Test Name

from COFFEE to CUPS

Deadline

Assigned to

Duration

STEP 1: HYPOTHESIS

We believe that

hotels want to represent themselves as more sustainable and environmental-conscious.

Critical:

▲ ▲ ▲

STEP 2: TEST

To verify that, we will

ask different local hotels.

Test Cost:

Data Reliability:

STEP 3: METRIC

And measure

their interest in a sustainable representation.

Time Required:

STEP 4: CRITERIA

We are right if

at least one of three hotels state the importance of a sustainable image and portfolio.

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Source: Own illustration based on Strategyzer (n.d.)

5.4 OceanSavers Algae Solutions

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5.4.1 Introduction

Every year, over 100 million marine animals die, and the ocean ecosystem is under immense threat. Marine life as we know it is being irreparably damaged by chemical contamination of the oceans, and nearly 1000 species are affected by marine pollution. Until today, 500 dead zones have already been discovered where marine life is no longer possible (Natural Resources Defense Council 2021). Ocean pollution is widespread, increasing, and poses a clear and present threat to life below water and human well-being (The Conversation Trust 2021). The oceans are an integral and essential part of the earth's ecosystem and are fundamental to sustainable development. They are crucial for global food security, human health, are the main regulator of the global climate, provide us with water and the oxygen we breathe (United Nations 2021).

Ocean pollution is a mixture of toxic metals, plastics, chemicals, petroleum, pesticides, industrial waste and sewage. More than 80% of the pollution is due to human activities (The Conversation Trust 2021). One aspect of that pollution is ocean acidification. The ocean absorbs about 30% of the carbon dioxide that is released into the atmosphere from, among other things, the burning of fossil fuels. When CO₂ is absorbed by seawater, a series of chemical reactions occur that acidify the ocean and lower its pH value (National Oceanic and Atmospheric Administration 2020). The increase in CO₂ over the last 200 years due to human activities has made the ocean water 30% more acidic than any other known change in ocean chemistry over the last 50 million years (Smithsonian Institution 2021). If society keeps up with their emissions practices, the oceans could become 150% more acidic by the end of the century. (Natural Resources Defense Council 2021). Changes in water chemistry can have huge impacts on marine life because they cannot adapt as quickly to these changes (Smithsonian Institution 2021). The effects are already visible: coral reefs collapse, oyster beds disappear, the shells of marine animals dissolve, and tiny creatures become smaller, weaker, or even extinct (Center for Biological Diversity, 2021/ National Oceanic and

Atmospheric Administration 2020). This represents a planetary crisis because, in addition to biodiversity loss, acidification will affect fisheries, aquaculture and threaten the food security of millions of people, as well as tourism and other sea-related industries (Smithsonian Institution 2021).

Although the Canary Island of Tenerife is in an advantageous geographical position due to volcanic rocks that improve water quality, ocean acidification is a threat to the water quality around the island and marine life there (Interview with biologist, Appendix A). Therefore, it was decided to focus on the sustainable development goal number 14 “Life below water” and to develop a business idea to combat ocean pollution and counteract acidification. This resulted in the creation of the Team “Ocean Savers” and the “Algae Solutions” project. The goal of the business idea is to plant algae that can bind CO₂ to clean the ocean and slow down acidification. The first location of the project is Tenerife, but the project can be implemented easily on any other Canary Island or even worldwide.

In the following, the Business Idea is explained in detail with the help of the Canvas model, its sustainability is demonstrated, and its chances and risks are evaluated with the help of a SWOT analysis.

5.4.2 Business idea development

After the formation of a project team with sorting out strengths of the participants as well as the definition of the problem to be counteracted, various steps are taken to develop a business idea. The following chapter deals with the elaboration of a Sustainable Business Model Canvas.

5.4.2.1 Business Model Canvas

The individual dimensions of the model are examined (Figure 13). In addition, the necessary steps in the development of the product are explained, as well as influencing factors that need to be considered. The following figure 13 corresponds to the filled-in Sustainable Business Model Canvas according to Bocken, applied to the solution of OceanSavers.

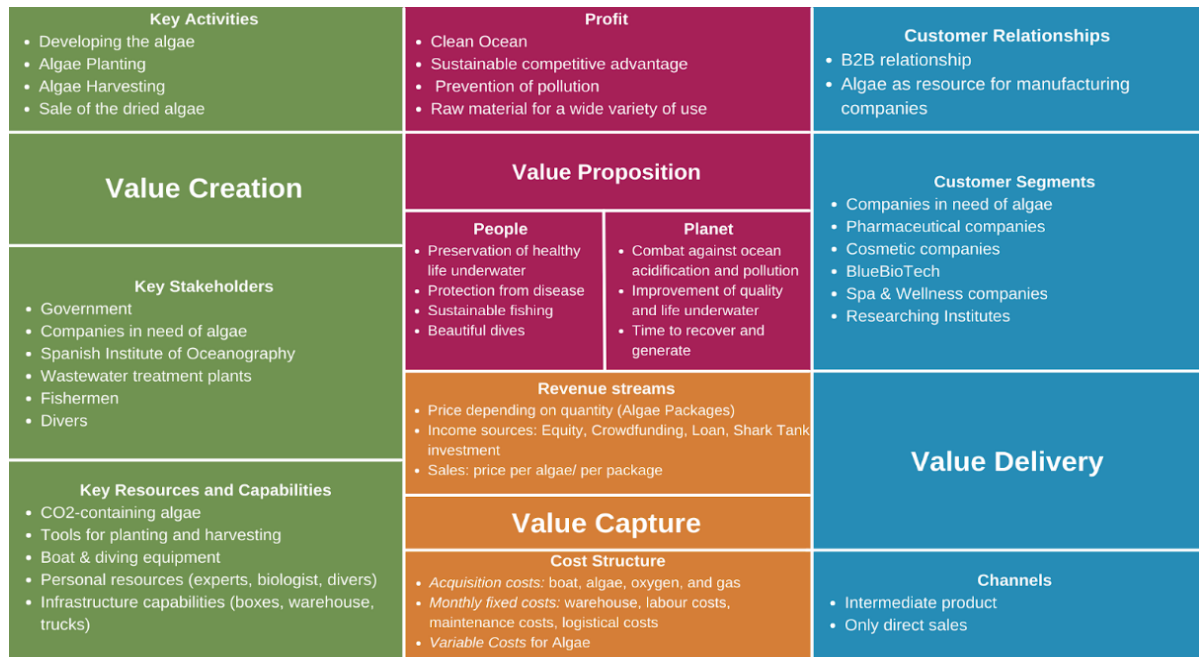


Figure 13: Sustainable Business Model Canvas for OceanSavers Algae Solutions
Source: Own illustration, based on Bocken 2018

To develop a sustainable business idea, it was decided to use the business model canvas as a guideline. The business Model Canvas consists of four dimensions: Value proposition, value creation, value capture and value delivery. In the following, the development of the business idea is shown with the help of these four dimensions. Since the most important factor in a company is their product, the first dimension to be studied will be the value proposition (Bocken 2018).

Value Proposition

To counteract the issue of over-acidification and pollution of the ocean, the decision was made to develop a product based on an algae-mix, a combination of different species to maintain biodiversity underwater, that is cultivated in certain areas near the coasts. These algae are supposed to bind CO₂, oil and other pollutants there and thus relieve the water body (Reske 2021). In total, one kilogram of algae can bind about 2 kg of pollutants (Lenz 2020). The algae can be harvested within a short time and, after drying, sold to end consumers for further processing. Since these algae reproduce independently and rapidly, all that is necessary after planting is the regular and controlled harvesting of these algae (Reske 2021/Lenz 2020). Alternatively, these algae can also be used to clean wastewater in sewage treatment plants, preventing pollutants from being discharged into the ocean. (Reske 2021/Bioökonomie 2016)

Profit

Algae can be processed as a raw material for a wide variety of end products: Animal feed, cosmetics, food supplements, and biofuel. Similarly, algae can be used in sewage treatment plants, preventing pollutants from being discharged into the ocean. Since companies that use

algae as a resource for their product have a constant need for algae, the demand is undoubtedly there (Hermes 2018/Reske 2021/Bioökonomie 2016).

A study conducted by TNS Infratest in March 2018 with 1015 respondents between the ages of 14 and 65 shows that around 68 percent of respondents shop and consume more consciously to make their personal contribution to promoting sustainability. This shows that sustainable products and the responsible choice of processed resources have a high influence on the purchasing decisions of many consumers. Since algae sold by potential competitors are usually cultivated in laboratories and grown in artificial tanks, OceanSavers algae have an increased value in terms of sustainability due to their previous background. Accordingly, the resource "Algae that previously cleaned the ocean" can be seen as a sustainable competitive advantage for our customers' products.

People

The positive effects of the algae solution for the society include the preservation of healthy flora and fauna underwater, the preservation of coral reefs and the general cleaning of the water (Reske 2021). The required resources are not only used in the cycle but are also sourced from the region. This means that there are no long transport routes and no additional emissions, which improves the air quality on Tenerife. Lastly, some microalgae pose a threat to the island's inhabitants due to a bacterium they contain. By harvesting the algae regularly, people are protected from disease. Furthermore, the inhabitants of the island will once again have the opportunity to engage in sustainable fishing, as there will be more fish again. The tourism industry can then advertise again with beautiful dives (Nagelkern et al. 2016).

Planet

Considering the impact on the planet, algae can be used to combat ocean acidification and microplastic pollution. This improves the quality of life underwater and less fish die. The diversity of underwater animals increases again due to better water quality. In addition, the resources required are used circularly and there are no long transport routes and no additional emissions. This gives the environment the necessary resources and time to recover and generate itself (Rahman et al. 2020).

Value Delivery

Customer Segments

Since the development of a business idea is a continuous process, the target group first worked out, changed into a new one. This development is shown in the following.

The first target group was local fishermen. The algae were to help restore fish habitat to make the fishermen's jobs easier. With better water quality, fishermen no longer have to go as far

out to sea, and they once again can catch enough fish to earn a living. The first target group also included diving companies that offer dives for local people and tourists. These should again have beautiful diving experiences.

Through further research, it was realized that the first persona was insufficient as a target audience because the company would not make a profit through the fishers and divers. Thus, after further research, it was decided to shift the target groups. The new target group to benefit from the algae product is generally all companies that can work with them. By focussing on different customers and segments, the risk is spread. These include pharmaceutical companies, cosmetic companies, the BlueBioTech company and spa & wellness companies. Among others, the algae will also be sold to companies that need them for further research (e.g., fuel). Despite the shift to a different target group, the previously mentioned target groups and society in general still benefit from the Algae solution. They are no longer the direct customers but can still profit from a clean sea.

Customer Relationships

OceanSavers strives for a B2B relationship with its customers. Harvested and dried algae are sold as a resource to manufacturing companies for processing. Their end products can then be labelled with the seal "This product has helped to combat ocean acidification" and sold to the end customer.

Channels

Since OceanSavers Algae Solutions' algae are sold as an intermediate product, only sales from direct trading relationships are intended. No further third-party channels are being considered.

Value Creation

Key Stakeholders

Since the product represents value not only for the chosen customer segment, but also an extraordinarily high value for the public, various groups have an interest in the success of this company. The following companies and groups can be considered as stakeholders:

Clearly, the government's goal is to protect the environment and clean up the ocean that surrounds Tenerife. This not only affects the quality of life of the locals, but also the attractiveness of Tenerife as a tourist destination. Similarly, the government is interested in the

creation of additional local businesses that will create jobs and strengthen the island's economy, to solve the dependency on income from the tourism industry.

As a targeted customer segment, companies that process algae for their products also have an interest in resources that are sustainably cultivated and have a high background value. In addition, there is no need to grow and cultivate algae themselves, which represents a cost and time saving for them. The targeted customer segment includes companies of the Pharma-, Animal Feed-, Nutritional Supplement-, Biofuel- and Cosmetic-Industry.

The Spanish Institute of Oceanography also has an interest in the conservation of underwater habitats, as well as an interest in researching such a solution in the open ocean. Marine biologists represent similar interests and can contribute to further development and monitoring by sharing their knowledge.

Since wastewater treatment plants can use algae to clean wastewater, they are also interested in an efficient solution. By reducing the release of wastewater into the ocean, wastewater treatment plants can also introduce more circularity and act more sustainably.

As groups that directly benefit from improving the water quality of the ocean, fishermen and divers are also stakeholders. Fishermen may encounter higher fish stocks, while divers may discover healthy coral reefs. Both groups can participate in the implementation through their knowledge and voluntary help, for example, harvesting algae underwater.

Key Activities

The main activity of OceanSavers is the development of the algae with the help of biologists. Once the algae are developed, they are planted in the sea near the coast. Another activity is the harvesting of the algae with the help of volunteers, such as the diving companies that benefit from the clean coral reefs. The last main activity is the sale of the dried seaweed to the companies.

Key Resources and Capabilities

To be able to carry out the above-mentioned main activities, only a few resources are needed. These include personal, material, and infrastructural resources.

Considering the material resources, the CO₂-containing algae are needed in any case, as well as the appropriate tools for planting and harvesting the algae. This includes, for example, a boat and diving equipment. It also includes personal resources such as the divers who dive in

the sea and harvest the algae. Regarding the personal resources, there is close collaboration with biologists and experts involved in the development of the algae.

Finally, suitable infrastructure capabilities must be in place. These include the boxes in which the harvested algae are transported. These are collected in a warehouse and dried there, because then they are longer lasting and easier to transport (Hermes 2018). This requires a large warehouse and trucks for transport from the coast to the warehouse. Lastly, other means of transport are needed for onward transport to the customer.

Value Capture

Cost Structure

The cost structure is clearly presented in the following tables: The first table shows the acquisition and acquisition costs. These include all the costs, that appear only once in the beginning of the business model implementation. The acquisition costs for a boat, 25,000 algae as well as oxygen and gas sum up to €185,000.

Table 2: Acquisition and Acquisition Costs, OceanSavers Algae Solutions

Acquisition	Acquisition Costs
Boat	€50,000
Algae (x 25.000)	€125,000
Oxygen and Gas	€10,000
Sum	€185,000

Source: Own illustration

The second table shows the monthly fixed costs OceanSavers Algae Solutions must face: the monthly fixed costs, including rent for a warehouse, labour costs of five employees, the maintenance for boat and petrol as well as logistical costs sum up to €20,000 per month.

Table 3: Monthly Fixed Costs of OceanSavers Algae Solutions

Cost Item	Monthly Fixed Costs
Warehouse (1000 m ²)	€4,000
Labour Costs (5 employees)	€12,000
Maintenance Boat and Petrol	€2,000
Logistical Costs	€2,000
Sum	€20,000

Source: Own illustration

The following table displays the income source and the amount of income to start the project.

Table 4: Income Sources and Amount of Income OceanSavers Algae Solutions

Income Source	Income
Equity (5 founders x €15,000)	€75,000
Crowdfunding Campaign	€50,000
Loan	€60,000
Shark Tank Investment	€50,000
Sum	€235,000

Source: Own illustration

In calculating how many algae must be sold per month to bring the desired income per month to 25,000 euros, it is assumed that one alga achieves a sales price of 15 euros, while variable costs per alga are 5.60 euros. Under these conditions, 1666 algae must be sold per month to achieve a monthly income of 25,000 euros. The following table shows a package model in which the price per alga depends on the quantity of algae purchased. If a customer buys a package with 1,000 algae, he receives a significant quantity discount.

Table 5: Quantity based price list for expense coverage OceanSavers Algae Solutions

Number of Algae per package	Price per package	Price per Algae	Number of sold Algae needed to cover costs
1 Perennial	€15	€15	1666
100 Perennials	€1,200	€12	2083
1,000 Perennials	€10,000	€10	2500

Source: Own illustration

Revenue Streams

The revenues are all generated with the sale of the harvested algae that have already cleaned the ocean. Due to the wide range of customers and segments who require these algae, the risk decreases as there is no dependence on just one buyer. This income, combined with the work of the volunteers, covers the running costs mentioned above and makes the organization survivable.

5.4.2.2 Towards a Circular Business Model

The created business model stands out for its circularity. Circular business models create supply chains that recover or recycle the resources used to create their products (Atasu, Dumas/ Van Wassenhoven 2021). This approach was applied to the business idea and

visualized in a loop model as figure 14, which shows that instead of using linear resources, circular alternatives have been used (Circular Input Model) (Lacy et al. 2020: 24).

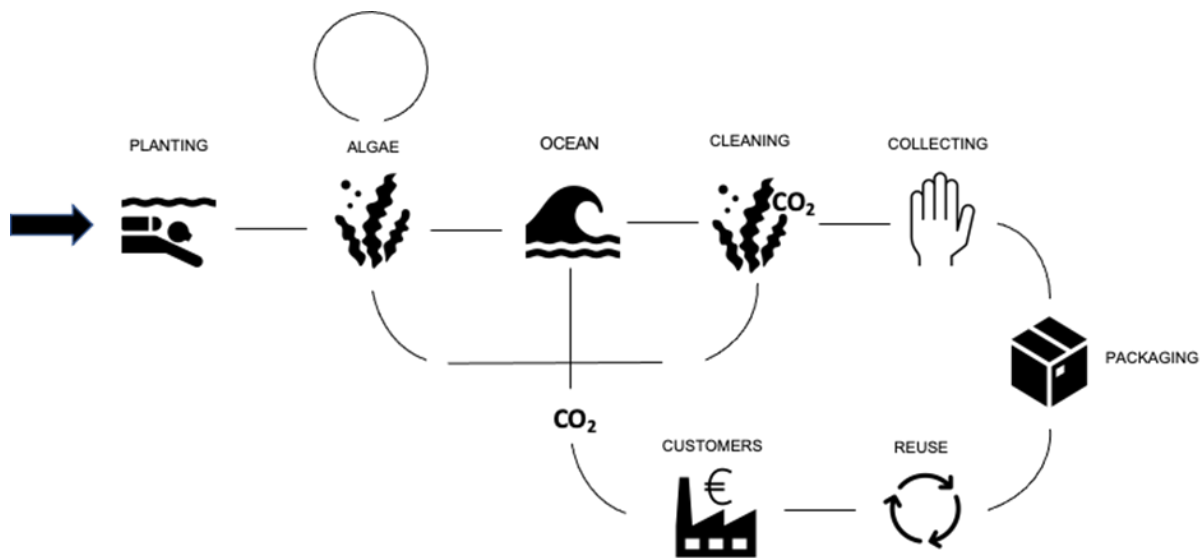


Figure 14: Circular Loop Model
Source: Own illustration

In the first step, the algae are planted into the ocean. Algae are capable of growing very fast, as they double their volume every 24 hours (Meffert 2013). Therefore, the algae represent a circle on its own in the circular business model, because it renews itself all the time. In the next step of the loop model, the algae bind CO_2 , oils, pollutants and further minerals and clean thereby the ocean (in the illustration CO_2 is used as an example). Therefore, the cleaning process also creates a loop on its own as the algae grow and clean without anyone interfering. Afterward, the algae are collected and packaged, to be sold to the customers. It must be emphasized that the dried algae are reused by the customers, in other words, they buy the waste product. In the theory of circular business models, this is called product use extension. The aim is to extend the use of an object and to be able to offer it on the second-hand market (Lacy et al. 2020: 24). To close the last circle of the loop model, it has to be taken into account that during the production process of the customers or the application of their final product, pollutants and CO_2 are released, which finally end up in the ocean again. These are then bound again by the planted algae. Through this achieved circularity, the sustainability of the business model becomes evident.

Pretotyping

To test and investigate the circularity of the business idea, a pretotyping was carried out. The described pretotype is visualized in figure 15. This helped the OceanSavers in pitching to investors. The pretotyping was intended to present the business idea visually to interested parties. A glass of polluted seawater was used for this purpose. Algae were inserted here to illustrate the planting of the algae. After some time had passed, the algae were harvested.

What remained was a glass with clean and purified seawater. This water is now of better quality and provides a better habitat for the animals there. The remaining algae are dried and then sold. Nothing was left over, which illustrates the circularity of this project.

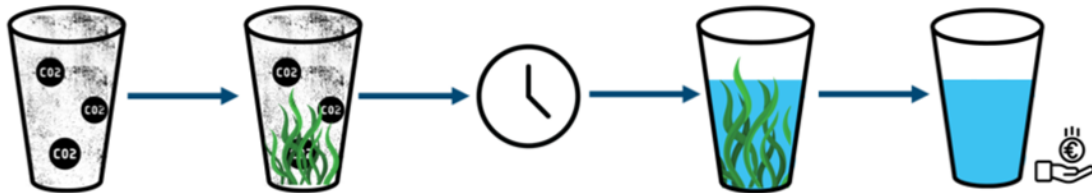


Figure 15: Visualization of the Pretotype of OceanSavers Algae Solutions
Source: Own illustration

5.4.2.3 SWOT- and Risk-Analysis

The goal of a SWOT analysis is to provide information for the derivation of strategic options. First, an environmental analysis is carried out, analysing the opportunities and risks in the environment. This is followed by a company analysis, i.e. an analysis of the strengths and weaknesses of the company. For the development of a strategy, the external and internal information is brought together (Nagel M. et al. 2020: 335).

SWOT-Analysis		
	Opportunities	Threats
	- Trend towards sustainability - Change in customer behavior: Purchase of more sustainable products - Promotion/support of environmental organizations (Greenpeace, ...) - No/barely any competitors - Growth opportunity (increasing demand and quasi unlimited acreage in the ocean)	- Weather conditions - Entry of new competition - New conditions may arise due to possible shift of territories - Too few sales opportunities - No or not enough support by biologists/marine institute/divers - Critical press reports due to bad image of some algae species
Strengths	SO-Strategy	ST-Strategy
- Innovative product - Qualified staff - Good location close to customers (Canary Islands) - Natural and sustainable resource - Short decision-making process - No-waste production - Circular business model - Safe the Ocean	Use the sustainability trend to market the innovative, sustainable product.	Development of new sales markets
Weaknesses	WO-Strategy	WT-Strategy
- Little know-how about algae in principle therefore dependence on marine institute - Weak financial strength/ little capital - No patent protection - No livelihood security for the founders - No awareness yet/ no network - Little topographical knowledge - Supply and assembly pipes (dependency)	Expand knowledge through recruitment and consultation with expert biologists/institutes/organizations	Merger with possible new competitors for larger supply and sales volumes and more capital

Figure 16: SWOT Analysis OceanSavers
Source: Own illustration

Figure 16 shows the SWOT-Analysis for the product of OceanSavers and is further described in the following text.

Strengths

One of the strengths of OceanSavers' business idea is its highly innovative product, as it is one of the first companies to use algae to clean up the ocean. The qualified staff can also be seen as a major strength. In addition, the location on the Canary Island of Tenerife is advantageous, as the company's potential customers are also located within the archipelago. The start-up's flat hierarchy also means that decision-making paths are very short, making OceanSavers a very agile and adaptable company. By using algae as a natural resource, the environment is not harmed or affected. The company has a circular business model, which makes it very sustainable. This includes the company's no-waste production. The algae are grown and planted in-house so that it can fulfill the company's mission to clean the ocean. After the algae have pooled enough nutrients, they are degraded and replaced with new plants. The degraded plants do not end up as a waste product in the trash but are dried and resold to customers for various purposes, such as making nutritional supplements or cosmetics. The founders' heartfelt mission is seen as one of the company's greatest strengths: To clean up the ocean and thus protect life under water and improve the quality of life there.

Weaknesses

Since the company has little know-how about algae, the algae must be developed by biologists. Therefore, there is a dependence on marine institutes. In addition, there is little capital available, which in turn leads to weak financial strength. As a result, there is also no livelihood security for the founders. Moreover, a weakness is seen in the fact that there is no patent for OceanSavers' product yet, therefore there is no patent protection. As it is a start-up company the awareness of the company is not widespread on Tenerife and no large network could be built up yet. The seabed around the island of Tenerife is not ideal for growing algae, so additional pipes are needed to plant the algae (Atlantik Surf 2015). However, the team does not have sufficient topographical knowledge. Furthermore, there is a dependency on suppliers to provide and install the pipes.

Opportunities

One of the greatest opportunities for the company is the current strong trend towards sustainability, which is also evident in Spain and especially in European countries (Gérard et al. 2021: 6). This trend is also changing the general consumer behavior towards the increased consumption of sustainable products and products whose supply chain is also sustainable (YouGov 2021: 11-15). Products made from OceanSavers' algae can demonstrate these characteristics, which may encourage companies to purchase OceanSavers' plants. Another

opportunity is seen in other environmental organizations, such as Greenpeace or Sea Shepherd, becoming aware of the startup and supporting them in their mission through financial or intellectual assistance. Furthermore, there are hardly any other competitors in the vicinity of the Canary Islands who cultivate algae for the protection of the ocean and resell it to other companies. This, and also the almost unlimited expansion of the cultivation area, is seen as a great opportunity for the future growth of the company (Pejic-Pulkowski n.d.).

Threats

Due to unpredictable weather conditions, such as volcanic eruptions or storms, there is a risk to the business model (Köndgen 2011). The entry of new competitors could also endanger the company. New conditions could arise in the future as a result of the possible shift in the borders of the territories. There is also a risk of receiving too little customer demand, resulting in few sales opportunities. This could result in no or low revenues and costs not being covered. In addition, there is uncertainty as to whether the company is supported at all or sufficiently by biologists, a marine institute or divers. Finally, critical press reports could occur due to the bad image of some algae varieties, which could cause lasting damage to the company. (Die Presse 2017)

The following strategies are derived from this:

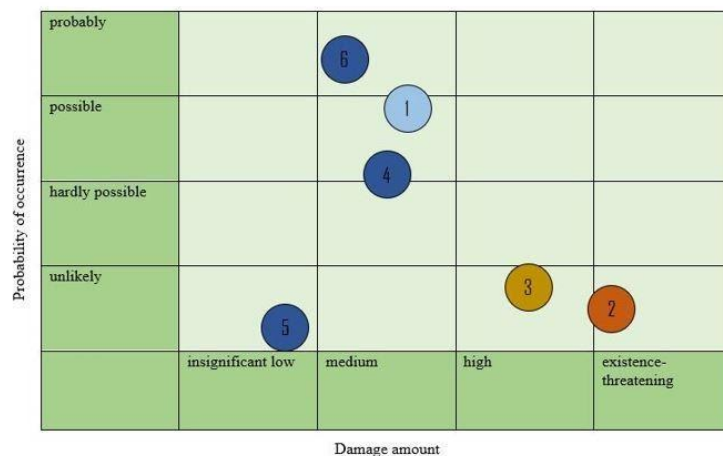
SO-Strategy: Use the sustainability trend to market the innovative, sustainable product.

ST-Strategy: Development of new sales markets

WO-Strategy: Expand knowledge through recruitment and consultation with expert biologists/institutes/organizations

WT-Strategy: Merger with possible new competitors for larger supply and sales volumes and more capital

A risk analysis is used to identify and record developments in the company's risk areas. The first step is risk assessment, followed by risk management, and finally a risk portfolio is used to visualize the potential damage and probability of occurrence. (Moos, G., Peters, A. 2021: 88-91). In Figure 17 you can see the risk analysis of OceanSavers for the risks described before, in Figure 18 the possibility of influencing these risks is shown.



Market risks:

1. entry of new competition

Performance risks:

2. not enough support from biologists/marine institute/divers

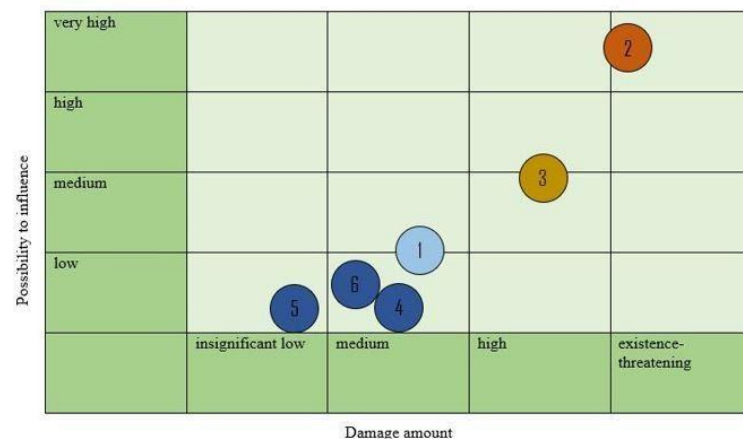
Financial risks:

3. too few sales opportunities

Other risks:

4. weather conditions
5. new conditions may occur due to possible shift of territories
6. critical press reports due to bad image of some algae varieties

Figure 17: Risk analysis OceanSavers
Source: Own illustration



1. little influenceable, possibly create market barrier
2. very well influenceable, recruitment through attractive offers
3. relatively easy to influence, expand sales markets (especially geographically)
4. not influenceable
5. not influenceable
6. hardly influenceable, only by active positive appearance in the press

Figure 18: Possibility to influence risks OceanSavers
Source: Own illustration

The risk analysis shows that there is one risk that poses a threat to the company's existence, but the probability of occurrence has been classified as unlikely. This is the performance-related risk of not receiving any or not enough support from suitable biologists/institutes/divers. In figure 18, however, the influenceability of this risk was rated very high, since the company can normally look for suitable employees who meet the criteria at any time and retain them with appropriate remuneration.

Another risk with a very high level of damage is the financial risk of finding too few sales opportunities, which can affect the startup's margin. This was estimated to be so high mainly because the company has little capital, especially at the beginning, and missing margins can have a strong impact on the business. However, the influenceability of this risk has been assessed as medium to high, as new target markets can be found outside the Canary Islands.

The market risk of new competition entering the market is a medium risk for the company, but within the realm of possibility. However, the influenceability here is rather low to medium, as

the company cannot do anything about it except to create as high a market entry barrier as possible. The level of damage was assessed here from a financial point of view, since in the opinion of the founders, there can be no competitors in saving the ocean, only allies.

Other risks such as weather conditions, shifting of territories and critical press coverage were assessed as insignificantly low to medium. Bad press is very likely, as algae tend to have a bad image in the media these days, and weather conditions and severe weather are also very likely to occur. The change of the territories is rather unlikely. However, all three risks can hardly be influenced, only the bad press can be counteracted somewhat by the company with positive articles and marketing, the other two risks cannot be influenced.

It can therefore be seen that OceanSavers is aware of and has assessed its risks and has prepared itself for possible influencing of these risks. Thus, the company is not unprepared when these risks occur and anticipates that unexpected events may also occur. However, the startup's agility and flexibility means that it is positive about any future.

5.4.3 Evaluation

During our stay in Tenerife, we were able to verify our assumption that ocean acidification is a critical problem on the island. Subsequently, we have tested our idea for its feasibility, researched it and talked to locals and experts. In the process, we encountered various risks and challenges that led us to revise, adapt and expand our idea. For instance newly identified problems we had to approach were which type of algae we will plant, the steep coasts of Tenerife, which make planting difficult and to whom we will sell the algae after their use. As already described, a suitable algae mix was identified through extensive research. Furthermore, the method of planting the algae in pipes makes it possible to cultivate the algae in Tenerife. Due to the current trend for sustainable products and a more conscious lifestyle, we were able to identify numerous algae buyers from the various sectors on the island, which reduces the risk of our idea to a minimum. Moreover, the fact that our algae clean the ocean provides us with a competitive advantage against other algae suppliers. When we pitched our idea to investors, the challenges we identified were also addressed. However, the investors were convinced by our solutions and approaches and invested. One of the investors even pointed out that products made from algae, which previously cleaned the sea, are a suitable complement to the classic Tenerife souvenir: jewellery made from volcanic rock. One product from the land, one from the sea.

Our Business Idea is innovative, sustainable, meets the requirements of a circular business model and uses only local resources. Nevertheless, it is a complex project that requires the collaboration of the government and the support and especially further research of experts, which fortunately are present on the island. In addition, the project should be implemented on

a large scale to have the desired impact. Therefore, it must be implemented in appropriate locations worldwide. However, since the resources needed are very few and can be procured locally, this does not pose a problem. The issue of ocean pollution is omnipresent and has never been so important and dangerous for every living being on the planet as it is now. Therefore, the time to act is now and someone has to start somewhere: Therefore, we, the Ocean Savers, start in Tenerife and try to spread our project worldwide to clean the oceans and save life below and above water.

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5.4.5 Appendix

Appendix A: Interview with Biologist from Tenerife (Contact through Máximo Hernandez Nägele)

- ¿En general, es posible utilizar estos dos tipos de algas en combinación y puede tener efectos negativos sobre la biodiversidad que debemos considerar?

Los plásticos son polímeros derivados del petróleo y no son digeribles por los organismos, por efecto de la radiación y otros factores se van separando monómeros que si son asimilables biológicamente y utilizable por los organismos como fuente de energía.

Cualquier tipo de cultivo (animal o vegetal) afecta a la biodiversidad en general, pero no creo que el cultivo combinado de dos tipos de algas en un sistema controlado y confinado tenga efectos negativos dignos de tener en cuenta.

- Hemos escuchado que la roca volcánica y sus nutrientes tienen un efecto positivo en la calidad del agua. ¿Todavía puede darse el caso de que se produzca hiperacidez en el futuro?

Todos los nutrientes, sean derivados de rocas volcánicas o de otros materiales, tienen un efecto positivo. El medio marino está sufriendo una ligera acidificación debido a los incrementos de CO₂ en la atmósfera y por lo tanto a su potencial disolución en el agua, esta acidificación afecta principalmente a los organismos que tiene exoesqueleto, no veo relación directa con la descomposición de los microplásticos

- Planeamos utilizar una centrífuga para producir combustible a partir de las algas recolectadas. ¿Es esto también posible con una mezcla de diferentes algas?

Cualquier organismo vivo tiene los sistemas de síntesis de lípidos y por lo tanto es posible obtenerlos, pero no se si las algas tienen cantidad suficiente de lípidos que justifique su extracción industrial para combustible.

- ¿Hay oportunidades alrededor de la isla donde se puedan cultivar las algas? Qué condiciones necesitas (calor, frío, sol ...)

Las algas se desarrollan a profundidades entre 0 y 60 m más abajo no hay luz suficiente y las Islas Canarias son un sistema de montañas volcánicas sin plataforma continental, por lo que el cultivo extensivo de algas es difícil.

Appendix B: Interview with José Martínez Pineiro Munoz, an experienced diver and owner of the Diving shop Tiburón Libre in Santa Cruz, Tenerife

Hello, we are students from Germany and are currently researching the impact that human pollution of the ocean has on the fishing and diving industry in Tenerife. Would you be willing to answer a few questions in a short interview?

Hello, yes sure. My English is not so good, but I hope I can help anyways.

What is your name, and how long have you been a diver?

My name is José Martínez Pineiro Munoz and I've been diving basically my whole life. I started when I was a teenager, it has been 30 years by now. I opened this diving shop in 2002.

Are there any problems with diving due to ocean pollution?

You can see a lot of rubbish in the ocean. Even if you are 60 m below the waterline you can see plastic bags and other kind of trash. This is also a problem: The deeper you go into the water, the less sunlight you have: The plastic in deep water is conserved even longer than in coast areas.

Is the underwater world changing?

Yes of course. There are less fishes and coral reefs are getting sick or destroyed.

So there are fewer diving spots now?

Yes, especially the area around Santa Cruz and Granadilla is affected around Tenerife: More and more diving spots are destroyed or unavailable.

Do you have problems finding customers?

No, I don't. Most of my customers have been visiting my shop for years. They are all very passionate about that sport.

Do you talk about ocean pollution with your customers? What do they tell you? Are there diving schools as well?

We don't have many diving schools in Santa Cruz, most schools are located in the south of Tenerife. But I do hear that the divers are obviously concerned about the situation.

What are your fears for the future?

As diving is my passion, I am afraid that the pollution will get worse and destroy underwater life. Also, if diving wouldn't be possible around Tenerife anymore, I would have to close my shop and find another place to work. That would be horrible.

Okay, thank you a lot for your time and your answers! You helped us a lot!

6 Conclusion

On the island of Tenerife there is an optimal microcosm. In this area, which is largely isolated from external influences, one can optimally create concepts and ideas and try them out. Tax advantages would also make it easier for almost any company to start up, which is why Tenerife really wants young companies and start-ups to work on this beautiful island.

So, we were not here to take a holiday, but to make the best possible use of the conditions and to build something up.

Since a huge number of tourists visit each year, Tenerife is faced with a lot of problems like the amount of waste that is produced. Especially since the people are living on an island, they don't have the same possibilities as others on the mainland. Knowing these obstacles, we really focused on solving the problems on the island, especially regarding the environment. This included thinking about ways how the cities could become greener, introducing a new way on how to collect fresh water, trying to produce an alternative for single use plastic or inventing something to clean the ocean. Saving the earth is not done overnight or by just being a little more conscious. For this, new ways and alternatives which make an impact are needed.

We have developed many concepts, each of which can contribute a great deal to a more sustainable world. But unfortunately, we can't fix the whole world with them. If all the ideas are implemented together and further improved, then the impact on our environment can at least be made visible. But our business ideas can certainly have a big impact in the long term, if only because we students deal with sustainability conscientiously and extensively and take this knowledge with us into our future. Finding a solution which can really change the world won't be easy at all.

In order to make a worldwide change, or even just on Tenerife, people first have to be informed about the problems and be aware of the impact on the environment. If the added value of the alternatives and ideas are visible for the individual and the whole community, a change of behaviour could be implemented. This drives impactful and long-term solutions forward.

Let's contribute to a cleaner and brighter future.